William Benson and the golden age of malacology in British India

Biography, illustrated catalogue and evaluation of his molluscan types

Richard C. Preece, Tom S. White, Dinarzarde C. Raheem, Hilary Ketchum, Jonathan Ablett, Harold Taylor, Kevin Webb and Fred Naggs

PREAMBLE

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AUTHOR CONTRIBUTIONS

The project was conceived by RCP and FN. Original text was researched and written by RCP and TSW with contributions from FN, DCR and HK. Reviewing and editing was undertaken primarily by TSW, RCP, FN and DCR, with contributions from JA. Specimens were photographed by HT and KW. Figures, maps and diagrams were prepared by TSW. The database was initiated by HK and other data curation was undertaken by TSW. Funding from the Isaac Newton Trust was obtained through RCP.

INSTITUTIONAL ABBREVIATIONS

BMAG = Bristol Museum and Art Gallery, Bristol, UK
BRSMG = used in conjunction with BMAG registration numbers
MANCH = Manchester Museum, UK
MCZH = Museum of Comparative Zoology, Harvard, USA
NHM = Natural History Museum, London, UK; formerly British Museum (BM) prior to 1881 and British Museum (Natural History) (BM(NH)) from 1881 to 1992.
NHMUK = used in conjunction with NHM registration numbers
OUMNH = Oxford University Museum of Natural History, UK
RAMM = Royal Albert Memorial Museum, Exeter, UK
EXEMS = used in conjunction with RAMM registration numbers
UMZC = University Museum of Zoology, Cambridge, UK
USNM = National Museum of Natural History, Smithsonian Institution, Washington D.C., USA
ZSI = Zoological Survey of India, Kolkata, India
NZSI = used in conjunction with ZSI registration numbers

A NOTE ON GEOGRAPHICAL NAMES

Countries, regions and localities mentioned throughout the taxonomic portion of this work have been taken from the original descriptions of taxa, or from contemporary published sources such as *Conchologia Indica* (Hanley and Theobald, 1870–1876) and relevant volumes of the *Fauna of British India* series (Blanford and Godwin-Austen, 1908; Gude, 1914, 1921; Preston, 1915). As far as possible, all historical locality names from the British colonial period are listed in Appendix 2, together with relevant alternative spellings, geo-coordinates and data sources.

In order to facilitate comparison with the catalogue and historical literature, the preceding biography of William Benson and his malacological network in "British India" has also been written primarily from an historical perspective and we have therefore used British colonial (anglicized) names in preference to those in current use. Two important examples are Burma and Ceylon. In the case of the former, we have elected not to use the alternative name Myanmar, since in nearly every case it has been used in an historical (pre-1989) context and Burma is currently in wide use as an alternative contemporary name. Similarly, we refer to Sri Lanka as Ceylon throughout the historical sections, although we have used the modern name in certain circumstances. We have also usually used historical names such as Calcutta (for Kolkata) and Bombay (for Mumbai; see Appendix 2). For the same reason we have used anglicized names for hill or mountain ranges (e.g. Nilgiri Hills, Anaimalai Hills). We are aware, however, that the widespread use of Dravidian hill names in combination with the English word 'hills' is tautological and that it is increasingly common to use the Dravidian term alone (e.g. Nilgiris or Anaimalais) in preference to the anglicized form (see Raheem et al., 2014: 20 for a detailed discussion). Some regional and sub-regional names of the British colonial period are still in current use, although the configuration and extent of these areas has changed, often substantially. In such cases we have attempted to differentiate between the old meaning of the name and the new meaning, by showing the former within double quotation marks (e.g. "Salem District" of British India vs. the much smaller modern Salem District).

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CONTENTS

Preamble i
Author contributions i
Institutional abbreviations i
A note on geographical names i

Introduction 2

William Benson: biography of the pioneer malacologist in British India 2

Benson's malacological network 8
Family, household and friends 8
Clergy and civil servants 12
Military 13
Other naturalists 15
Physicians 17
Geological Survey of India 20

H.H. Godwin-Austen's contribution and the *Fauna of British India* series 22

Appreciation of Benson's early work 29

Chronology of events 29

The Benson shell collection 33
The fate of the Benson collection 36
Problems of authorship 40
Evaluation of type material 40
Geographical coverage 47

CATALOGUE 53

Taxonomic notes 224

Nomina nuda 229

Species erroneously attributed to Benson 231

Molluscan genus-groups described by W.H. Benson 244

Discussion 352

Acknowledgements 360

Literature Cited 361

Appendix 1: Benson's Scientific Career 386
Appendix 2: Index of Localities 390
Appendix 3: Geographical Occurrence of Taxa Described by W.H. Benson 415

Index
People and Institutions 421
Benson's taxa 425

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ABSTRACT. – William Henry Benson (1803–1870) made extensive collections of Mollusca, particularly land snails, from South Africa, Mauritius, and especially from the Indian subcontinent, where he spent his working life in the service of the East India Company. Benson also received many more molluscan specimens from friends, family and a network of colleagues that included naturalists, physicians, clergy, serving officers in the military and staff of the Geological Survey of India. By this means he obtained material from diverse and often remote parts of India, as well as from Burma, Sri Lanka, China, Malaysia, Borneo, Singapore, Australia, St Helena and Cape Verde. Details of this malacological network are provided, together with a biography of Benson himself and a history of his pioneering role as a malacologist in British India. In a series of papers published between 1829 and his death in 1870, Benson introduced 471 species-level names belonging to 60 families of gastropod and 8 families of bivalve, and in addition introduced names for 32 genus-groups. Of the 102 genus-group names described with Benson species as their types, 70 are currently recognised. Benson's descriptions were typically rather brief, usually in Latin and almost invariably without illustrations, making it difficult to use them for reliable diagnoses. In keeping with the common practice of the period, he rarely designated individual specimens as types. On his premature return from India in 1847 following a debilitating illness, he gifted numerous specimens to friends and colleagues in various institutions, many of which were gradually acquired over the following decades by the British Museum, later the Natural History Museum, London (NHM). The bulk of Benson's remaining collection was acquired after his death by Robert McAndrew, who incorporated it into his own huge collection that he bequeathed to the University Museum of Zoology, Cambridge (UMZC) in 1873. The Benson collection suffered badly before it was acquired by the UMZC; most of Benson's original labels were replaced, resulting in the loss of detailed locality data and presenting difficulties in establishing the type status of many of his specimens. Here, we attempt such an evaluation, through detailed examination of surviving evidence, and provide a comprehensive illustrated catalogue of the taxa described by Benson that can be traced in the UMZC and NHM (and some elsewhere). We provide colour images of type specimens of each species and designate lectotypes and neotypes where appropriate; all such designations proposed here should be attributed to Preece and White. Benson's taxa are set into a modern systematic framework and some new taxonomic combinations are proposed. Three species are newly synonymised herein: *Sitala infula* (Benson, 1848) is a junior synonym of *S. turbiniformis* (Benson, 1838); *Carychium boysianum* Benson, 1864 is a junior synonym of *C. indicum* Benson, 1849 and *Helix tescorum* Benson, 1853 is tentatively considered as a junior synonym of *Rhagada torulus* (Férussac, 1819). Several new generic combinations are proposed: *Cyclostoma liricinctum* and *C. orbiculatum* are attributed to *Circulus* (Vitrinellidae); *Clea annesleyi* to *Nassodonta* (Nassariidae); *Cyclostoma milium* to *Angustopila* (Gastrocoptidae); *Pupa ofella* to *Gulella* (Streptaxidae); *Succinea orientalis* to *Oxyloma* (Succineidae); *Pupa diopsis* and *P. seriola* are transferred to *Vertigo* (Vertiginidae), the first records of this genus from India; *P. brevicostis* is transferred to *Insulipupa* (Vertiginidae); and *Camptonyx* is removed from the Succineidae and provisionally placed in the Lymnaeoidea. Furthermore, we recognise *Bullaea caurina* Benson, 1842 as having priority over *B. exarata* Philippi, 1849 and *Tanychlamys* Benson, 1834 as having priority over *Macrochlamys* Gray, 1847. The localities from which Benson obtained specimens, together with other important places mentioned, are listed with their pre-colonial and current names (and name variants), their country and state/province, and their geo-coordinates.

KEY WORDS: Mollusca, taxonomy, W.H. Benson, malacology, British India

INTRODUCTION

The collection and description of new animal and plant taxa from around the world was a major activity during the early and middle parts of the 19th century. Much of this work was facilitated by the burgeoning empire-building of European nation states, which sent professional staff (often with their families) around the world to secure administrative, business and military outposts throughout their spheres of influence. One of the main areas of activity throughout the 19th century centred on the Indian subcontinent and neighbouring parts of South Asia, where British civil servants, clergy, soldiers, physicians and others found themselves stationed in far-flung, unexplored locations. In many cases, these postings expressly required the exploration and description of the locality, opening up new opportunities to record the flora and fauna for those with an interest in natural history. Individuals on the front line of exploration inevitably lacked expertise in certain groups, but this could often be rectified by calling on the knowledge of more sedentary experts, to whom specimens could be sent for identification and description. These men (and some women) became known to each other through networks of correspondence and specimen exchange, creating hubs of activity that could truly be described as a 'golden age' for collecting and taxonomy. One such network was centred around **William Henry Benson** (1803–1870), who spent his professional career as a civil servant in India with the East India Company (EIC). While there, he pressed his family, household and myriad contacts into service as collectors of natural history specimens and amassed a formidable collection of molluscs, particularly of land snails, from India and elsewhere, accompanied by supporting data.

In addition to cataloguing and evaluating Benson's specimens, the purpose of this volume is to describe in detail what we know about William Benson and his network of malacological collaborators in India and elsewhere that led to the formation of his important collection of shells. These details are of critical importance because many of Benson's type series were split between his own collection and contemporary private and museum collections. He donated material collected during the early part of his career and described in the late 1820s and early 1830s to the Asiatic Society of Bengal and the Zoological Society of London, retaining some shells. He also examined and described a collection of shells from the "north-east frontier of Bengal" acquired by the Asiatic Society in 1833 and was evidently allowed to retain specimens for his own collection. The remaining material formed part of the Asiatic Society's collection before being moved to the Indian Museum in Calcutta (Kolkata) in the late 19th century and finally transferred to the Zoological Survey of India (ZSI) in 1916. The collections of contemporaries such as William Theobald, Edgar Layard and the Blanford brothers were also examined by Benson at various points in his career and therefore form part of the type series of numerous species. However, most of the specimens that formed Benson's own collection came with him to England when he retired, where they were eventually dispersed between the collections of the University Museum of Zoology, Cambridge (UMZC), which contains the majority, and the Natural History Museum, London (NHM), formerly part of the British Museum (BM). A few Benson specimens found their way to other institutions in Britain and the USA, and there are possibly others still to be identified. It is important to note that natural history specimens in the BM were kept with the main collections in Bloomsbury until 1881, when they were transferred to a new, purpose-built building in South Kensington. The post-1881 institution, called the British Museum (Natural History) or BM(NH), only became fully independent from the BM in 1963. The formal change of name to the NHM occurred in 1992, and this has led to some confusion because many publications, including the *Fauna of British India* series (see below), refer to specimens in the BM or BM(NH). All specimens labelled in this way are in the NHM and are here referred to using registration numbers with the correct NHMUK prefix. In our historical notes, however, we retain the contemporary names for the institution and so refer to the BM (in the context of pre-1881 references) and BM(NH) when referring to the period between 1881 and 1992.

Benson's collection contains numerous holotypes and several hundred syntypes of taxa that he described. We provide an illustrated catalogue of these as the basis for systematic studies of the molluscan fauna of the Indian subcontinent and other localities from which Benson described material.

William Benson: biography of the pioneer malacologist in British India

William Henry Benson was born on March 30th, 1803 in St Helier, Jersey. The son of Lieutenant Colonel and Mrs M.A. Benson, he had four sisters, whom he mentioned in his Will (dated 25th August 1834, now lodged at the National Archives, Kew). In 1819 he entered East India College (later Haileybury College) near Hertford, the training establishment founded in 1806 to provide a general and vocational education for civil servants destined to work for the East India Company (EIC). The "Form of Interrogation" submitted as part of his application to East India

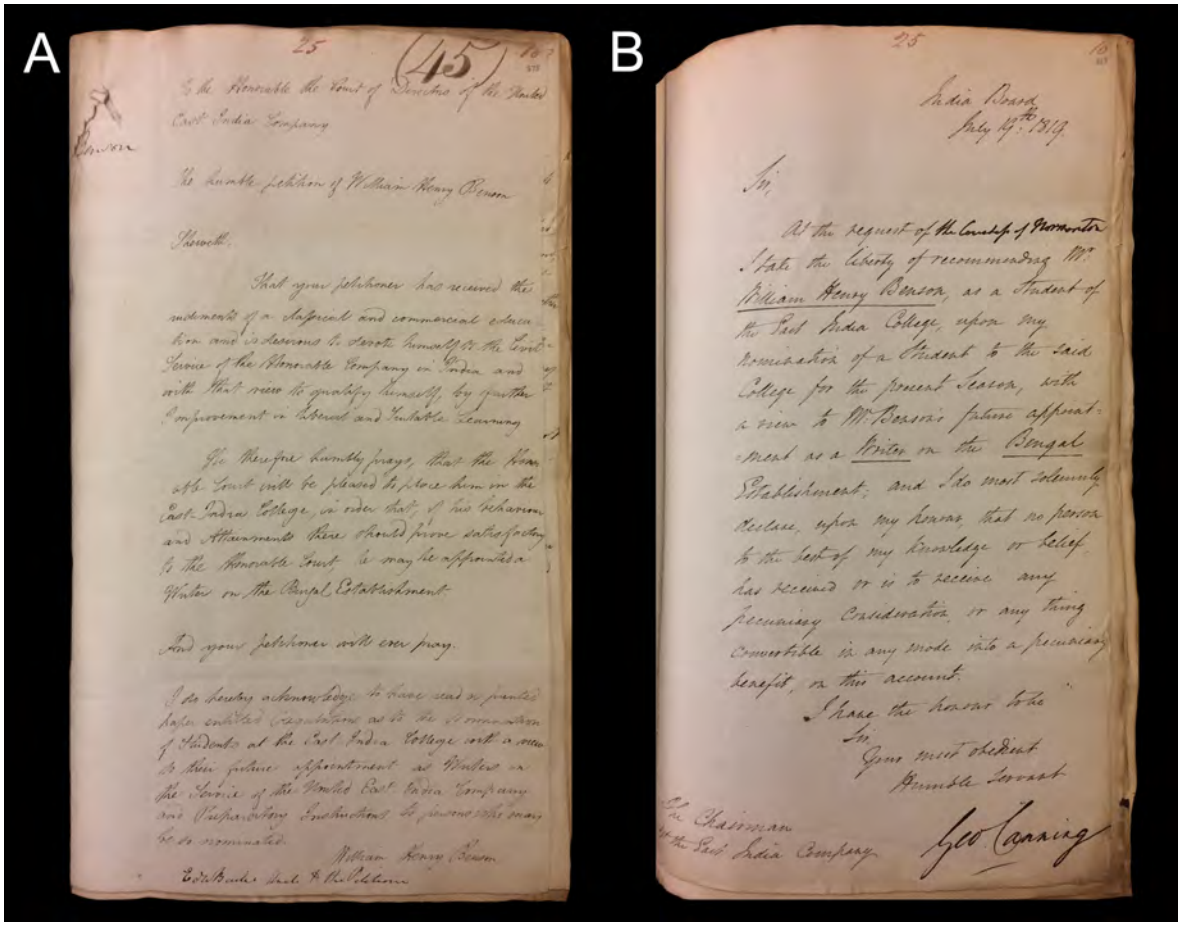


FIGURE 1. A. William Benson's "Humble Petition" to the Directors of the East India Company requesting admission to East India College. **B.** Letter written on 19th July 1819, at the request of the Countess of Normanton, by George Canning in support of Benson's nomination to enter East India College. British Library IOR/J/1/34/378-85.

College (London, British Library, Records of the East India College, Haileybury, IOR/J/1/34/378–85) provides the only other detail known of his early life, that he had previously been taught by a Mr Maxwell of Parsons Green, Fulham. No portrait of Benson is known to survive; apart from his body of scientific publications, knowledge of his career and personal life can only be gleaned from fragments recorded in the sprawling EIC archives, now in the British Library, and other archival material housed mainly in the NHM.

The EIC was effectively the Government of British India throughout the first half of the 19th century, although it was to come under increasing parliamentary control from London during Benson's career before being liquidated in 1858, a decade after his retirement. When Benson was accepted at East India College, prospective students had to be nominated, through a system of patronage, to coveted positions known as "writerships" in the EIC overseas Civil Service. Attendance of the College was usually for four terms, spanning two years. Documents associated with Benson's nomination (IOR/J/1/34/378–85) show that he was well connected. His "Humble Petition" (Fig. 1A) to the "Honorable Court of Directors" was countersigned by his uncle, Edward Bailie (1778–1838), a Lieutenant Colonel in the Royal Marines, who wrote an additional letter of support. His trump card, however, was a testimonial written by George Canning (1770–1827), then President of the Board of Control, a cabinet position with responsibilities for overseeing the EIC and Indian affairs in general. Canning was a British statesman and Tory politician who occupied various positions of high office, including Foreign Secretary, Chancellor of the Exchequer and ultimately Prime Minister in 1827 (he died in office after only 119 days). Canning's involvement stemmed from his acquaintance with Benson's aunt, Jane Agar (née Benson, d. 1826), the Countess of Normanton, who requested the testimonial for her nephew (Fig. 1B). These connections were instrumental in Benson gaining his place at East India College, which were tightly rationed by the EIC due to the cost of educating prospective civil servants and the high salaries subsequently offered to them (cf. Marshall, 1997).

During his two years at East India College (1819–1821), Benson was a promising all-round student. He was described by a contemporary, Edward Hume Townsend (1803–1860, later Secretary to the Bombay Government and Revenue Commissioner to the Presidency of Bombay), as "a warm-hearted Irishman, who continued ever after my cordial friend; he was in the Second Term, my senior by 6 months." (Townsend Archive). Benson was particularly adept in Political Economy, for which he was awarded a prize in his third term and the gold medal in his fourth (Anon, 1821a, b; Danvers et al., 1894). Final-year students were ranked by the College Council, this position contributing to their subsequent status in the Civil Service. In order to retain their ranking, students were required to depart for India within six months of leaving the College; failure to do so would lead to them being ranked last in the subsequent cohort. Benson was ranked fourth in the first class of students posted to Bengal in 1821 (Anon, 1821b) and was clearly amongst the most gifted students to graduate that year.

After leaving East India College, Benson was destined to spend his working life with the EIC in India. As expected, he departed for India within the statutory six months, arriving in Calcutta on 30th October 1821. On arrival he was both young and single, but on 3rd August 1827 he married Maria Scott at Humeerpore (Anon, 1828) and they went on to have three children: two sons, Arthur Edward (1829–1866) and Charles Annesley (1831–1906), and a daughter, Sophia Mary (1835–1882). Benson occupied a series of positions in the Civil Service, ranging from Officiating Register of Civil Courts to Magistrate and District Collector, before becoming an Officiating Judge for several major districts, including Meerut and Delhi (Naggs, 1997; see Chronology of Events, below, for further details). By 1836 he was receiving a monthly salary of 2,500 Company Rupees, which would have rendered him extremely wealthy in the newly established colonial outposts in India to which he was posted. As a senior judge, a position to which he had been promoted by 1839, he would have earned an annual salary in Company rupees equivalent to about £5,000 (Marshall, 1997), approximately £520,000 today.

Several of his early-career appointments were both challenging and onerous, leaving little time for leisure activities; Beames (1961) provides an interesting account of the work and lifestyle of a Bengal Civil Servant in the mid-19th century. In what time remained, Benson dedicated himself to natural history. By the early 1840s his generous income had enabled him to buy properties in various parts of the districts in which he worked, including an estate known as "Rockville" in the hill station at Landour, and another at Saharunpore. Although his main interests lay in molluscs (chiefly land snails), beetles, especially ant nest beetles (Paussinae), were the subject of four of his papers (Benson, 1829a, 1846, 1847, 1861a; see also Westwood, 1846, 1847a, b, 1849). Indeed, he collected sufficient insect specimens in India to be able to donate "several boxes of insects from Landour, including several new species of *Coleoptera*" to the Entomological Society of London (Anon, 1847: 63), and his collecting endeavours led **John Obadiah Westwood** (1805–1893) to describe him as "this very zealous entomologist" (Westwood, 1849: 145). Although Benson only published a few entomological papers himself, he clearly retained a keen interest in insects alongside his passion for snails. He provided various insect specimens for description by entomologists such as Westwood, and in his malacological papers he mentioned in passing the capture of "a fine specimen of the splendid *Buprestis chrysis*" (Benson, 1836a) and "a specimen of *Paussus Burmeisteri*, harbouring under stones" (Benson, 1851b). The rich detail of the natural history observations contained within Benson's lost journals and notebooks is further hinted at by his knowledge of Indian botany: "Besides some other plants in flower which I had not leisure to note, I observed a little blue-flowered *Tradescantia*, a dwarf *Ruellia*, and a beautiful large-flowered *Pesticia* with spikes of flowers of a pale verdigris-green colour…" (Benson, 1836a: 357).

The study of natural history occupied Benson throughout the 26 years he lived in India until his premature retirement from the Civil Service in 1847, apparently following a long-term disability (Naggs, 1997: 39 and 85). He spent much of 1846 and the early part of 1847 in the Cape of Good Hope [South Africa] with the hope of recuperating his health, which now threatened to end his career. He wrote of undertaking searches for specimens there "upon crutches, during short explorations in places to which a wheeled carriage could convey me" (Benson, 1847: 31; see also 1851b: 103), and this impediment seems to have been a permanent disability that caused the loss of the use of his legs from which no recovery seemed possible. It seems quite likely from these symptoms that he had contracted polio. Whatever the reason, he was obliged to retire. Returning briefly to India from the Cape he visited Mauritius, where he met his old friend **Sir David W. Barclay** (1804–1888), a member of the Legislative Council who had assembled a collection of local endemic snails, including a few undescribed species. Benson provided formal descriptions of several taxa in this collection, naming one after Barclay (*Helix barclayi*) and another after William Caldwell (*Helix caldwelli*). Some of these species are

now endangered (*Helix setilirus*), critically endangered (*Helix caldwelli*) or extinct (*Bulimus sanguineus*), casualties of the dramatic loss of forest habitats on Mauritius since the 1840s.

Several shells in Barclay's collection had been collected by **William James Caldwell** (1820–1887), who then worked at Royal College Port Louis, but who later became Assistant Colonial Secretary under Edward Newton, brother of Alfred Newton, the renowned ornithologist and first Professor of Comparative Anatomy at Cambridge. Caldwell had a general interest in natural history and has two genera of land snails named after him (*Caldwellia* H. Adams, 1873 and *Pseudocaldwellia* Germain, 1918). He was the last person known to have seen the Rodrigues Parakeet (*Psittacula exsul*) alive in 1875, and it was Caldwell who sent the last known specimen (a male shot by William Vandorous) of this now extinct species to Alfred Newton in Cambridge, where it is preserved, together with a female collected earlier, in the UMZC. These two specimens are the only surviving examples of the Rodrigues Parakeet (sometimes known as Newton's Parakeet).

Benson continued on to India from Mauritius with two living specimens of the African land snail *Lissachatina fulica* (Bowdich), which was a common species on the island. He arrived in Calcutta in April 1847, and just before leaving India for the last time, he gave these two snails to a friend who subsequently released them in his garden at Chowringhee, near the Asiatic Society Museum. To Benson's (1858c) apparent delight these soon became established and, according to William Theobald, "This Species now abundant in Calcutta, was introduced from Mauritius a few year ago, and now abounds about Park Street." (Theobald, 1860: 91). Although the initial spread was slow (Blanford, 1868; Annandale, 1907; Godwin-Austen, 1908a), this innocent act was to burden parts of India with a significant agricultural pest that persists to this day (Srivastava, 1992). It is interesting to note that recent work on the molecular phylogenetics of *L. fulica* has demonstrated that populations now present in South Asia, Southeast Asia and the Pacific region all belong to the same mitochondrial 16S rRNA haplotype, indicating a genetic bottleneck from the time that *L. fulica* spread from its home in East Africa (Fontanilla et al., 2014). A new study based on CO1 gene sequences supports the hypothesis that while the original 1847 introduction remains the principal source of Indian *L. fulica*, over the past decades there have been multiple introductions of the species into India (Vijayan et al., 2020).

Benson briefly visited Ceylon each time he travelled to and from India. On one visit (March 1846, en route to the Cape), the ground was dry, as was the vegetation, and he found little of interest. However, on another occasion (April 1847, returning from the Cape via Mauritius) at the same locality, near Galle harbour in the south of the island, he came across large numbers of acavid land snails that had emerged from their hiding places following heavy showers. He wrote: "With reluctance I quitted a field so imperfectly explored by conchologists, and where doubtless other new species remained to reward researches uninfluenced, as mine were, by the warning flag and rising smoke of the Suez steamer" (Benson, 1851a). His final departure to England, however, proved to be providential because the areas in India of which Benson was a member of the administration were precisely those in which the Indian Rebellion originated. Indeed, had Benson remained in India until 1857, it is likely that he would have perished, a fate that befell many of his successors.

On his return to Europe, Benson spent time in Cornwall, Dublin, London and the spa town of Malvern in Worcestershire, giving several different addresses at the foot of his published articles. During the 1850s he also spent long periods on the Continent, presumably in an attempt to recover the use of his limbs, submitting papers from Spa in Belgium (where his wife, Maria, died in 1855 at the age of 47), several French towns including Cannes and Nice, and from Aix la Chapelle (now Aachen, Germany, where his son, Arthur, died in 1866). He eventually retired back to England, moving to residences in Cheltenham, Gloucestershire, where he finally settled at 7 Queen's Parade (Fig. 2) with three servants: a housekeeper, a cook and a parlour/housemaid. This house is part of a beautiful Georgian terrace opposite the Montpellier Spa, an extremely convenient residence for a regular user of the mineral waters, especially for anyone with mobility problems. It was from Cheltenham that Benson wrote the majority of his later papers, and he lived there until his death on 27th January 1870. After a funeral service at Cheltenham Minster (formerly St Mary's Church), conducted by the Rev. J.H. Brown, he was buried in Cheltenham cemetery on 2nd February 1870.

Benson published very little work relating to molluscan species that occurred in the British Isles, but he did write two papers about clausiliids (Benson, 1856a, b), one about a new English locality for *Ponentina subvirescens* (as *Helix revelata*; Benson, 1848a), and another about Irish freshwater shells (Benson 1842a). While in Nice, France, he discovered a minute land snail that he thought was an undescribed species, naming it *Pupa rivierana* (Benson, 1854a), but this subsequently proved to be a junior synonym of *Truncatellina callicratis* (Scacchi, 1833). He also

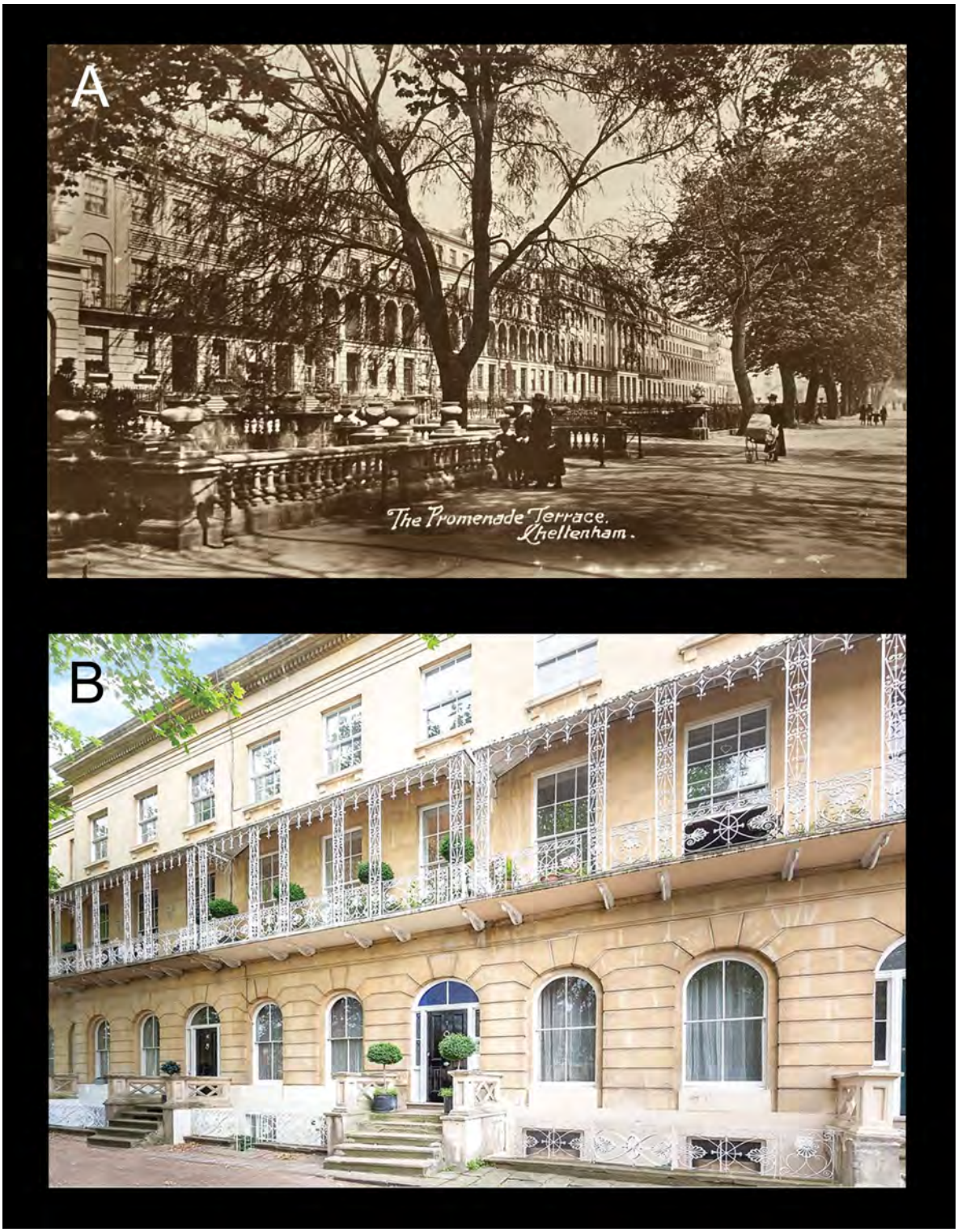


FIGURE 2. William Benson's residences in Cheltenham. **A.** The Promenade Terrace, taken from a postcard printed by Harvey Barton & Son, Bristol, c. 1910. **B.** 7, Queens Parade, where Benson lived until his death in 1870.

worked on material that he had collected (or had been given) from the Cape Verde Islands (Benson, 1856c), St Helena (Benson, 1851a, 1856c), South Africa (Benson, 1850a, b, 1851b, c), Mauritius (Benson, 1850b, 1853a, 1857a, 1859a) and Jerusalem (Benson, 1859b), and provided descriptions of material from localities further afield, such as Australia (Benson, 1852b, 1853a, b, 1854a) and China (Benson, 1842b, 1850c, 1851a, 1855a). Although his interests centred primarily on land snails, Benson published several

papers on freshwater species (e.g. Benson, 1829b, c, 1830a, b, 1835a, 1836a, b, 1837a, 1838a, 1843) and also described a few marine molluscs. Some of these marine species were encountered in coastal areas, but in parts of Asia several families normally considered "marine" have representatives that extend into brackish or even freshwater ecosystems, including genera such as *Clea* and *Nassodonta* (both Nassariidae), *Cremnoconchus* (Littorinidae), *Novaculina* (Pharidae) and *Scaphula* (Arcidae); see Reid et al. (2013) and Strong et al. (2017) for a discussion about specific adaptations to freshwater shown by some of these taxa. Benson also described several pelagic species, including some small holoplanktonic taxa, which he recovered from tow-nets from the open ocean during the long sea voyages to and from India aboard the *Malcolm* in 1834–1835, and on a passage from Bengal to the Cape aboard the *Gloriana* in 1846 (Benson, 1835b–d, 1837b, c, 1860a, 1861b). It appears that most of the specimens Benson collected on his earlier voyages did not survive, since he lamented them being "crowded with too many specimens in spirits of insufficient strength [and were] no longer recognisable when I had an opportunity of substituting a stronger preservative liquor" (Benson, 1837b: 151). However, it is the extensive collections that he assembled from the Indian subcontinent for which he is best known, justifiably being regarded as one of the pioneers of Indian malacology (Naggs, 1997). Indeed, when Benson first began collecting, the land snail fauna of British India and Burma was almost completely unknown, as was that of Sri Lanka, which despite its proximity to India, yielded a highly distinctive fauna rich in endemics (Benson, 1851a, 1853b, c, 1856d, 1860b, 1863a, b, 1864a, 1865a). The same was true of the Andaman Islands, for which Benson provided the first accounts of the land snail fauna, including descriptions of several undescribed taxa (Benson, 1860c, 1861c, d, 1863a–c).

Benson's taxonomic activities were not confined merely to the description of new species and forms, which were at that time given far greater prominence, but extended to descriptions of 32 new genera, as well as clearer definitions of existing ones (e.g. Benson, 1832, 1837a, 1838a, 1843, 1849a, 1851c, 1857b, 1858a, b, 1859c, 1860d, e, f, 1864a). His own name is commemorated in the names of several genera described by others (including *Bensonia* L. Pfeiffer, 1855, *Glyptobensonia* Möllendorff, 1894, *Bensonella* Pilsbry & Vanatta, 1900, *Trichobensonia* Möllendorff, 1902 and *Bensonies* H.B. Baker, 1938), and numerous molluscan species have been named in his honour, together with at least two species of insect (*Merismoderus bensoni* Westwood, 1847 and *Protaetia bensoni* Westwood, 1849). He was also generous with material, supplying undescribed specimens for description by other eminent malacologists and entomologists, and also to collectors of the day, such as Hugh Cuming. The shells from Cuming's collection described as *Helix candaharica* L. Pfeiffer, 1846 and *Vitrina bensoni* L. Pfeiffer, 1849, for example, were collected by Benson himself. Although most of Benson's papers are essentially taxonomic, he also published some regional surveys (such as his early work on the Gangetic Provinces) based either on fieldwork (Benson, 1829d, 1834a, 1835d) or on material present in museums (Benson, 1836a, b). Ecology, as currently understood, had not developed into an established science at that time, but two of Benson's early papers were concerned with the occurrence of aquatic taxa in temporary pools formed by rain and unconnected with permanent bodies of water. He even conducted some simple experiments, using a species of "*Paludina*", to establish how long aquatic operculates were able to survive prolonged periods out of water. He also observed that some aquatic snails that were presumed to be phytophagous would consume the flesh of a dead frog or could be induced to eat living arthropods (Benson, 1829e, 1830c).

When Benson first arrived in India there was no appropriate local journal in which he could publish his observations, and publication in established British journals was hardly appealing given the long delays that would have been involved. The Asiatic Society, established in 1784, published the journal *Asiatick Researches*, but its first President, Sir William Jones, was an outspoken and avid promoter of animal rights who was opposed to studies in zoology (Anon, 1914). Indeed, his strong views are thought to have inhibited zoological research in India until around 1828 (Bose, 1885). It was not until 1829 that Captain James Dowling Herbert, the Deputy Surveyor-General, founded a monthly periodical called *Gleanings in Science* (Larwood, 1962). This was initially intended to be an abstracting journal for European publications, but it soon began to receive original articles, including several from Benson. After a couple of years, the scope and style of the journal changed, as did its name, becoming from 1832 the *Journal of the Asiatic Society of Bengal*. Benson was a regular contributor to this revamped periodical and was proposed as an ordinary member of the society in June 1835. However, in 1840 another journal, the *Calcutta Journal of Natural History*, first appeared and Benson seems to have briefly changed his allegiance. Ostensibly this journal was established to fill a perceived void in the publication of articles on natural history, geology and related subjects, but it failed to compete with the

Journal of the Asiatic Society of Bengal and the venture was short-lived, ceasing publication in 1848 (see Mathew, 2015 for a full discussion). After his return to Europe in 1847 Benson chose to publish in the *Annals and Magazine of Natural History* and virtually all of his subsequent papers appeared there.

The absence of relevant reference material and good library facilities in India precluded significant research on his collection of shells, and Benson published just nine papers on them while resident there (Benson, 1829d, 1832, 1834a, 1835d, 1836a, b, 1838a, b, 1842b). Many of these early publications were general surveys that included both terrestrial and freshwater taxa, with one (Benson, 1838a) dedicated entirely to the distributions of bivalves. Indeed, it was the freshwater and brackish-water species, and also the marine pelagic species, that were the main focus of his publishing efforts during these early years, when he was not afflicted by the health problems that blighted his later life. His passion for land snails was already clear, however, and he published a note on how to collect and keep live specimens: "Persons not conversant with conchology would do well to preserve the shells, with the animals alive, in a small box with cotton around them, in which state land-shells may be preserved for several months… I have kept numbers of species of *Bulimus* alive for nine months… and I have now by me in good health species of *Cyclostoma* and *Caracolla*" (Benson, 1832: 14). Benson's publications on land snails did not begin in earnest until his return to England in 1847, after which a series of such papers began to appear, although by this time he was increasingly reliant on specimens sent to him by other people. For many years Benson had been excited by the prospect of getting living material back to Europe for detailed study and as early as December 1831 captured some specimens of *Tanychlamys* in India that he kept alive throughout his voyage back to England in 1832 until the summer of 1833 (Benson, 1834a, 1835d). He also kept several *Assiminea* "preserved alive in glass", which survived until they had passed St Helena, and two specimens of "*Cerithium Telescopium*" that required repeated changes of water (both fresh and marine) during their prolonged and circuitous journey to London (Benson, 1834b, 1835d). One of the latter survived this ordeal, enabling its behaviour and anatomy to be described in detail (Berkeley and Hoffman, 1835). The development of steam-powered shipping led to greatly reduced travel times and the possibility of obtaining living material from India, even after a voyage of four months. After his retirement to Cheltenham, Benson produced two papers concerned with living examples of Burmese snails that had survived amongst collections of shells sent by his son-in-law, Captain Richard Hieram Sankey, and Captain John Colpoys Haughton (Benson, 1859i, j). He wrote that "The rapidity of our steam-communication with tropical climates, and the knowledge that even land-shells provided with opercula, and to all appearances empty, may be reanimated, ought to stimulate our collectors, in the West as well as in the East, to transmit freshly-taken specimens to Europe for examination" (Benson, 1859j). Many of the species he encountered, or had been sent, were new to science and he immediately set about publishing formal descriptions. This urgency may have been prompted by a rivalry with American malacologists such as Isaac Lea, who had also begun to describe material from the same region (Naggs, 1997). Benson's late-career descriptions, however, were typically rather brief, usually in Latin and almost invariably without figures, making reliable diagnoses of species more difficult. Only six of his publications were illustrated with well-executed line drawings (**Table 1**). The lack of illustrations was probably not Benson's choice, and seems to have been due to the prohibitive cost of engraving, printing and colouring plates, which were reserved for articles deemed most important. Indeed, in 1839 the *Journal of the Asiatic Society of Bengal* was threatened with discontinuation due to the high costs incurred for illustrating its early volumes (O'Shaughnessy, 1839), rendering them a much rarer inclusion thereafter. The *Annals and Magazine of Natural History*, in which the majority of Benson's articles appeared, was similarly selective, publishing only a handful of plates each year.

Benson's malacological network

Despite his limited leisure time in India and elsewhere, Benson nevertheless amassed an impressive collection of molluscs and was able to add to this through an extensive network of at least 50 named contacts (**Table 2**) who were pressed into service to feed his appetite for new material.

Family, household and friends

Through his contagious enthusiasm Benson encouraged various members of his family to look for snails wherever they went. His two sons both joined the army and soon began to collect undescribed species in far-flung places, some of which now bear their names: *Achatina arthuri* (after his elder son, **Arthur E. Benson**) and *Clea annesleyi* (after his younger son, **Charles Annesley Benson**). Arthur, who had previously discovered *Ponentina subvirescens* (as *Helix revelata*) in Cornwall (Benson, 1848a), is also credited with the discovery of *Cyclophorus altivagus* in the Western

TABLE 1. List of illustrations published by W.H. Benson. Most of his illustrations appeared in his earliest papers in *Gleanings in Science*, in which he hesitated to name new species. This was partly due to lack of time, but also because he had sent examples of many of these species to G.B. Sowerby I towards the end of 1828 and expected him to describe them (Benson, 1829d: 264). Several specimens illustrated in Benson (1829d) cannot be identified with confidence.

Species	Figure	Publication	Notes
Unio favidens Benson, 1862	Plate VII, Fig. 1	Benson (1829d)	As "*Unio* B"
Scaphula celox Benson, 1836	Plate VII, Figs 2 and 3	Benson (1829d)	As "Fluviatile *Arca*"
Novaculina gangetica Benson, 1830	Plate VII, Fig. 4	Benson (1829d)	As "*Anodonta*? B"
Melania lirata Benson, 1837	Plate VII, Fig. 5	Benson (1829d)	As "*Melania* D"
Melania elegans Benson, 1837	Plate VII, Fig. 6	Benson (1829d)	As "*Melania* C"
Melania variabilis Benson, 1836	Plate VII, Fig. 7	Benson (1829d)	As "*Melania* A"
Melania pyramis Benson, 1837	Plate VII, Figs 8 and 9	Benson (1829d)	As "*Melania* B"
?	Plate VIII, Fig. 4	Benson (1829d)	As "*Bulimus* B"
?	Plate VIII, Fig. 5	Benson (1829d)	As "*Paludina* B"
Planorbis indicus Benson, 1836	Plate VIII, Fig. 6	Benson (1829d)	*Planorbis corneus* A
?	Plate VIII, Fig. 7	Benson (1829d)	As "*Pupa* A"
?	Plate VIII, Fig. 8	Benson (1829d)	As "*Lymnaea* B"
?	Plate VIII, Fig. 9	Benson (1829d)	As "*Lymnaea* A"
?	Plate VIII, Fig. 10	Benson (1829d)	As "*Planorbis* B"
?	Plate VIII, Fig. 11	Benson (1829d)	As "*Bulimus* A"
?	Plate VIII, Fig. 12	Benson (1829d)	As "*Achatina* A"
?	Plate VIII, Fig. 13	Benson (1829d)	As "*Paludina* C"
?	Plate VIII, Fig. 14	Benson (1829d)	As "*Cyclostoma* A"
Pterocyclos rupestris Benson, 1832	Plate 2, Fig. 1	Benson (1832)	
Camptoceras terebra Benson, 1843	Un-numbered text figure	Benson (1855c)	
Pterocyclos blandi Benson, 1851	Plate V, Fig. 1	Benson (1851d)	
Pterocyclos troscheli Benson, 1851	Plate V, Fig. 2	Benson (1851d)	
Camptonyx theobaldi Benson, 1858	Plate XII, Figs 1-7	Benson (1858a)	
Tanysiphon rivalis Benson, 1858	Plate XII B, Figs 1-3	Benson (1858b)	
Novaculina gangetica Benson, 1830	Plate XII B, Fig. 4	Benson (1858b)	
Tanalia (?) *stomatodon* Benson, 1862	Un-numbered text figure	Benson (1862a)	

Ghats (Benson, 1854b) and a whole article was devoted to the freshwater shells collected by Charles in southern India (Benson, 1860g). His daughter **Sophia Mary Sankey** is also credited with collecting *Helix palmaria* at the Fort Hill of Nundydroog, north of Bangalore (Benson, 1864a).

In October 1858, Sophia married **Richard (later Sir Richard) Hieram Sankey** (1829–1908), with whom she had two daughters. Sankey (Fig. 3A), who was born in Ireland, had arrived in India in 1848 after training as a military engineer in England. In 1850 he officiated as Superintending Engineer at Nagpur, where he collected specimens of the fossil fern *Glossopteris* and later described some observations of the geology of the region made by himself and Thomas Jerdon (Sankey, 1854). Sankey spent much of his life in the army as an engineer (1846–1884), seeing active service during the Indian Rebellion of 1857 and the Second Anglo-Afghan War, and being recommended for the Victoria Cross for actions at Jamalpur (Vetch, 2004). He also spent much of 1859 as executive engineer and Superintendent of the convict gaol at Moulmein, a garrison town in Burma. It was at Moulmein that Sankey collected two new species of land snail (*Clostophis sankeyi* and *Streptaxis sankeyi*), both of which were named after him by his father-in-law (Benson, 1859d). Sankey was in Moulmein at about the same time as **Charles Parish** (1822–1897), the noted botanist and illustrator, who in 1852 had been appointed chaplain in the service of the EIC (see Clayton, 2017 for an account of Parish's life, including contemporary photographs of Moulmein). Richard

TABLE 2. List of sources from which specimens that formed the type series of taxa described by W.H. Benson were obtained. The total number of species listed here exceeds that of valid Benson taxa because in several cases his type series consisted of material obtained from multiple sources.

Source	No. species	Source	No. species
William Theobald Jr.	96	Dr Francis Day	2
William Henry Benson	72	Dr John Thomas Pearson	2
Edgar Leopold Layard	40	Dr Henry Chapman	2
Dr Theodore Edward Cantor	35	Capt. William Bland	2
Asiatic Society Museum Collection	27	Hugh Cuming	2
Dr Thomas Claverhill Jerdon	23	Col. William Erskine Baker	2
Frederick Charles Layard	21	Lieut. Lefroy	2
William Thomas Blanford	21	D. Kohlhoff	2
Dr John Fergusson Bacon	15	Mrs Sophia Mary Sankey (née Benson)	1
Capt. John Colpoys Haughton	13	Lieut. G.W. Cox	1
Capt. Thomas Hutton	9	David Arnot	1
Robert Trotter	8	McGillivray coll. specimens in NHM	1
Henry Francis Blanford	5	J.W. Laidlay	1
Sir Richard Hieram Sankey	5	Major H. Alexander	1
Lieut. Charles Annesley Benson	4	Frederick Strange	1
Prof. Thomas Oldham	4	Rev. John Fry	1
Dr James Pattison Walker	4	Dr Roth	1
Capt. William John Edward Boys	4	Dr Thomas Thomson	1
Col. Jenkins	4	Dr D. King	1
Sir David W. Barclay	4	Lieut. Hatton	1
Rev. Samuel Bacon Fairbank	4	Lieut. W. Taylor	1
Arthur E. Benson	3	Lieut. F.W. Burkinyoung	1
William James Caldwell	3	Major FitzGerald	1
John Sydney Hawkins	3	Lady Elizabeth Gomm	1
George Brettingham Sowerby I	3	Mr Samuel Stevens	1
Lieut. Col. Robert Gordon	3	Dr Louis Pfeiffer	1
Mrs Gordon (wife of Robert Gordon)	2	Dr Johann Christian Albers	1
Joseph Doyle Smithe	2	Major Rowlatt	?
Mrs J.F. Hudson	2	Unspecified	19
John Chesson	2		

Sankey's career as an army engineer included a secondment to Melbourne (1870), an appointment in Simla as Under-Secretary to the Government of India (1877) and membership of the legislative council and fellowship of Madras University (Vetch, 2004). Amongst many other achievements, he was an accomplished artist, he designed Nagpur Cathedral and the High Court building (*Attara Kacheri*) in Bangalore, and he assisted with the creation of the marina, gardens and Government House grounds in Madras. In 1884, two years after the death of his first wife, Sophia (he later married Henrietta, widow of Edward Browne JP), he retired from the army with the honorary rank of Lieutenant General and returned to Britain to become Chairman of the Irish Board of Works (1884–1896). For this and other distinguished service he eventually became a Knight Commander of the Order of the Bath in 1892. Richard Sankey was also the Executor of William Benson's estate (see below).

Benson also enlisted his servants in the task of collecting snails: "The best method of collecting is to take several servants up the rocks, and after shewing



FIGURE 3. A. Richard Hieram Sankey (1829–1908). **B.** Edgar Leopold Layard (1824–1900). **C.** Dr Thomas Claverhill Jerdon (1811–1872). **D.** William Thomas Blanford (1832–1905). **E.** Henry Francis Blanford (1834–1893). **F.** Henry Haversham Godwin-Austen (1834–1923). **G.** Gerard Kalshoven Gude (1858–1924). **H.** Robert McAndrew (1802–1873).

them what objects are required, to employ them in turning over the fallen leaves, and inspecting the loose rubbish in the crevices of rocks" (Benson, 1832: 13). The use of domestic servants for collecting land snails (and other specimens) seems to have become a widespread practice amongst early naturalists and recommended rates of pay (e.g. four annas) for each new species, or for a good number of specimens, were debated in various articles (see discussion in Naggs, 1997: 42). Benson also encouraged many friends and colleagues (some known only through surviving correspondence) to undertake additional collecting wherever they were stationed. A letter to an unknown correspondent contains instructions to ask Mrs Gouldsbury [possibly the wife of one of his contemporaries at East India College] "to get me all the Darjiling snails she can collect and send them to Calvin to forward to me. It is a famous place for them and a great number of new species have been found there, some of them very large and some very minute" (Fig. 4). He even provided some simple sketches of snails from the area and details of the habitats in which they occur, concluding that "They will be a great prize to me." The collection of very small specimens posed a particular problem because of the lack of a ready supply of small glass phials. Benson resourcefully overcame this by simply using the cut ends of quills to serve as specimen tubes (Fig. 5), a method that he and his colleagues appear to have used routinely to contain minute specimens of both molluscs and insects sent by post (see Blyth, 1842: 927; Westwood, 1847a: 22; Benson, 1849c: 127). In a letter to J. Sydney Hawkins (see below), dated 29th April 1862 (ZOO_MSS_HAW), Benson also mentioned packaging a delicate specimen of *Helix revelata* in a hollowed-out cork "to save it from pressure".



FIGURE 4. Part of a letter written by Benson requesting an unknown correspondent to ask Mrs Gouldsbury [possibly the wife of one of his contemporaries at East India College] "to get me all the Darjiling snails she can collect and send them to Calvin to forward to me. It is a famous place for them and a great number of new species have been found there, some of them very large and some very minute". This letter is attached to a reprint of Benson (1859h) from the library of Thomas Hutton (NHMUK Mollusca Section Library, reprint no. 00548).

Clergy and civil servants

Some of the most notable naturalists of the 19th century, at least in Britain, belonged to the clergy (see Allen, 1976; Armstrong, 2000), although clergymen do not seem to have been a major part of Benson's network of contacts in India. A notable exception was the **Reverend Samuel Bacon Fairbank** (1822–1898), an American clergyman based for many years at a small mission outstation at Wadalé, about 30 km north-east of Ahmednugar. His missionary work in the Wadalé district had a lasting impact and his name is still resonant in the region today (Trafton, 2005). Fairbank had a lifelong love for natural science and pursued this interest in India by planting gardens wherever he went, and also collecting shells and bird skins for American museums, which helped to finance these scientific pursuits. He provided Benson with land snails from Ahmednugar (*Helix pedina*, *Achatina vadalica*) and from the Mahabaleshwar Hills (*Achatina arthuri*, *Helix neherensis*). It is clear that not all of these discoveries were the result of random or opportunistic collecting, but that Benson specifically requested that Fairbank searched for certain species, such as *A. arthuri*, even providing him with a rough sketch of the shell to aid the search. In recognition of these contributions, Benson named *Achatina fairbanki* from Mahabaleshwar after him. Fairbank's valuable input was also acknowledged by other malacologists, who similarly named Indian land snail species in his honour (e.g. *Bulimus fairbanki* L. Pfeiffer, 1857; *Opisthostoma fairbanki* W.T. Blanford, 1866; *Diplommatina* (*Nicida*) *fairbanki* W.T. Blanford, 1868; and *Spiraculum fairbanki* W.T. Blanford, 1896).

Another contact was **John Chesson** (1814–1873), who also collected land snails from the Mahabaleshwar Hills (e.g. *Achatina chessoni* and *A. notigena*). Chesson was an important local figure, whose foresight and initiative were credited with setting the community on a stable footing. As a retired warrant officer of the EIC, Chesson was asked to investigate the possibilities of establishing schools in the hilly region and to find out whether local conditions were suitable for European settlers. In an area surrounded by five hills, about 20 km east of Mahabaleshwar, he founded Panchgani. This was located in the rain-shadow of the Western Ghats and had far less rainfall than Mahabaleshwar, which was considered to be uninhabitable during the monsoon. Chesson encouraged

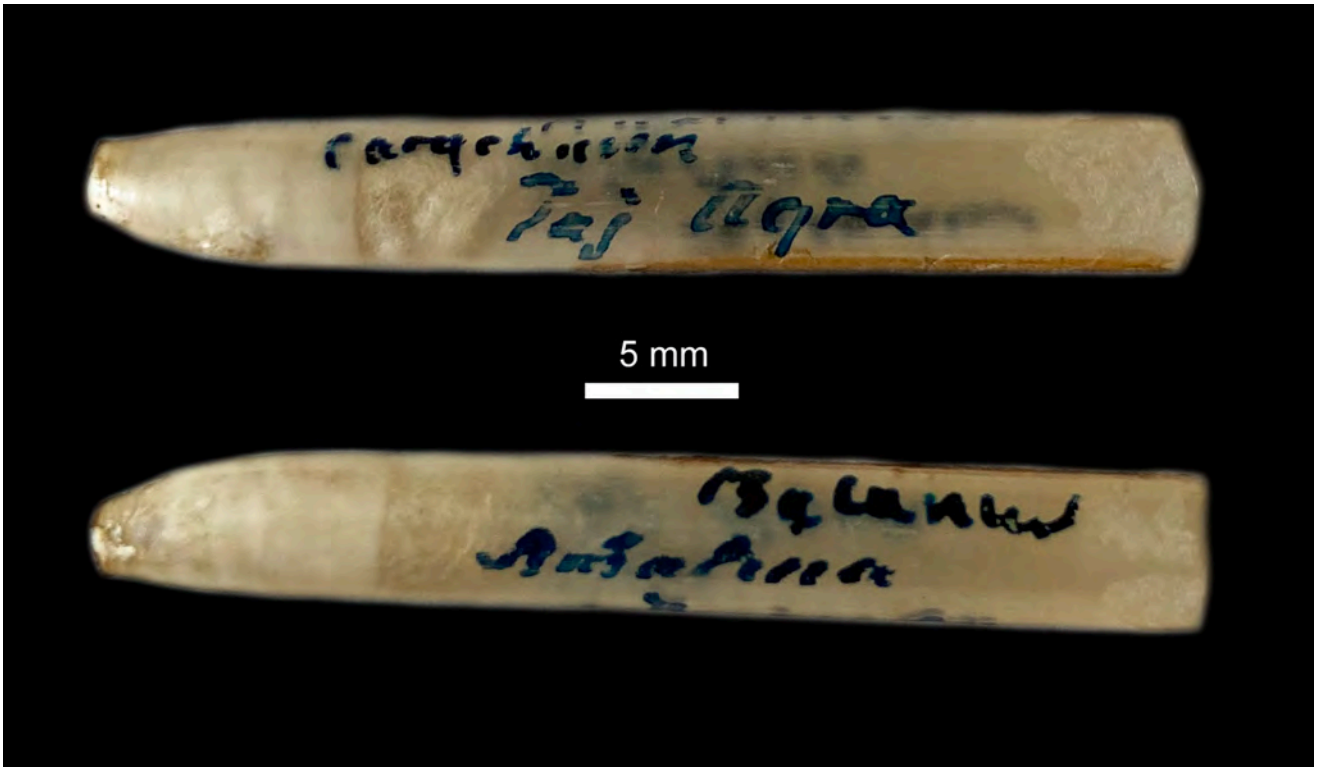


FIGURE 5. A quill adapted for use as a specimen tube (UMZC I.102435) that contained the holotype of *Carychium boysianum*, collected from Taj Agra (see Benson, 1864c: 210).

settlement at Panchgani by various means, including the planting of flora from the western world that would have been familiar to potential European settlers. He also became the local magistrate and Superintendent. Panchgani is now a famous hill station renowned for its premier residential educational institutions. Many hill stations had such a prominent individual whose role seemed akin to that of a country squire. Their doors were always open to guests, and they formed a proprietary interest in the land, its people, its wildlife and its potential for agriculture (Kennedy, 1996).

Robert Trotter (1807–1878) was another useful contact who worked for the Bengal Civil Service between 1827 and 1852 (see Doss, 1844). Like Benson, Trotter served as a District Collector in Bengal, and was the chief administrative official for that district with responsibilities that would have included work as a magistrate, and chairmanship of committees for local hospitals and schools. He travelled widely in India (and elsewhere) and undertook a journey down the Ganges from Patna to Calcutta, which he described in a journal now archived in the British Library (MSS Eur. Photo. Eur. 312). He collected numerous important land snail specimens from Darjiling, including several taxa later described by Benson (*Helix castra*, *H. cycloplax*, *H. lubrica*, *H. tugurium*, *Alycaeus urnula* and *Clausilia ios*). Trotter also spent time in the Cape in 1846, from where he undertook to collect further material for Benson on a trip from Cape Town to the interior. It was on this trip that Trotter discovered a new species of land snail at Uitenhage that Benson named in his honour (*Helix trotteriana*).

Lastly, mention should be made of **Joseph Doyle Smithe** (born 1838), who like Benson served as a magistrate in the Indian Civil Service. Both he and his brother, the Rev. Frederick Doyle Smithe (1822–1900), from Churchdown, Gloucestershire, were keen geologists and both were fellows of the Geological Society of London. Joseph ("of Madhopore") discovered the original specimens of *Helix hyba* in the mountains near Bari Do-ab, and he also collected specimens from the Punjab, including *Bulimus smithei* that was named by Benson in his honour.

Military

Many of Benson's correspondents were serving officers in the military, and some of them were eventually killed during various campaigns in India and Afghanistan, including **Frederick White Burkinyoung** (1808–1842) of the 5th Bengal Native Infantry, who was killed in action during the retreat from Kabul. **Captain** (later **Major**) **Thomas Hutton** (1807–1874), who was born to a Calcutta family, followed a career in the

Bengal Infantry, and was a long-standing friend and correspondent who was based in India throughout his life. He published numerous papers and notes on a wide range of subjects, including a book on silkworms (Hutton, 1860). Unlike most of Benson's other contacts in the army, who merely provided specimens, Hutton was sufficiently confident to describe some of the material himself, which he duly did, including a paper jointly authored with Benson (Hutton and Benson, 1838). He also wrote a paper expanding on Benson's (1830c) earlier observations on the ecology of a species of "*Paludina*", describing its behaviour during the dry season (Hutton, 1832). Hutton's military duties took him to various locations in India and Afghanistan, but he was nevertheless able to collect material from these hazardous places (Hutton, 1834, 1850). He also participated in excursions into the Himalaya, reaching altitudes of about 17,000 feet [5,182 m], where he made new observations on the flora and fauna from places like the Burenda Pass (Hutton, 1837). This Himalayan fieldwork resulted in the discovery of several new species of land snail, including some later named by Benson (e.g. *Pupa himalayana*). The fate of Hutton's main shell collection, which was sent to his sister in Australia after his death, is unknown. However, he donated specimens to the Asiatic Society Museum in 1834 (Hutton, 1834: 81), amongst which were shells described by Benson in 1836 as part of his study of the Society's collections (Benson, 1836a, b). Another surviving portion of Hutton's collection, which includes representatives of most of the taxa that he had described jointly with Benson in their 1838 paper, was donated to the BM in September 1856.

In the early 1850s Hutton became embroiled in Benson's dispute with **Dr John Edward Gray** (1800–1875), the Keeper of Zoology at the BM, over the taxonomic placement of *Diplommatina* (Benson, 1849a; 1852b; Gray, 1853, 1855). Both Hutton and Benson believed that this genus of minute land snails from the Himalaya did not possess an operculum, whereas Gray was adamant that it did. Hutton and Benson's failure to detect the operculum is understandable because it is transparent and extremely difficult to observe on the foot of the extended living snail and, in retracted snails, the operculum is moved deep into the interior of the shell where it is recessed out of view at an internal constriction (see also Macdonald, 1869). Unlike the situation in most operculates where the operculum seals the aperture and becomes dislodged after death, the operculum of *Diplommatina* remains fixed in this interior position and can only be revealed by breaking the shell (Naggs, 1997: Fig. 11). If this mistake is understandable, some of Hutton's others scientific ideas were, to say the least, fanciful and he was, in reality, rather a dilettante student of the natural sciences (Naggs, 1997). Nevertheless, he was consulted by Charles Darwin about hybridization in geese and is even mentioned in relation to this subject in *On the Origin of Species* (Darwin, 1859: 253). Benson commemorated Hutton by naming the Himalayan species *Gastrocopta huttoniana* after him (as *Pupa huttoniana*) and Louis Pfeiffer named both *Landouria huttonii* and the streptaxid genus *Huttonella* in his honour. Hutton's name is also well-established in malacological literature because he introduced the names of several synanthropic species (e.g. *Allopeas gracile*, *Pupoides coenopictus* and *Gulella bicolor*) that are widespread throughout tropical regions of the world (Hutton, 1834).

Another military contact, **Capt. William John Edward Boys** (1809–1854), served in the 6th Bengal Light Cavalry and was Assistant to the Commissioner of Kemaon and Gurwhal. According to Benson (1854b: 413), Boys was "an indefatigable collector in several branches of zoology", with interests in birds and insects (see Westwood, 1849) as well as molluscs. Indeed, his important entomological collection was auctioned by Stevens' Auction Rooms on October 31st, 1848 and his "Indian collection" on June 22nd, 1849 (Chalmers-Hunt, 1976), although Westwood (1852: 85) later noted that his types had already been purchased by "various English collectors". The Boys shell collection is not mentioned specifically in surviving sale catalogues, but entries in the NHM Mollusca section registers (NHMUK 1848.9.13.1–202 and NHMUK 1848.9.15.1–390) detail almost six hundred specimens "Purchased at Stevens', Collection of Capt. Boys". Older NHM registration numbers take the form of a date, so these entries indicate that the Boys collection was acquired prior to 13th September 1848 and was therefore not part of the aforementioned sales. Boys was a resident of the hill stations of Landour and Mussoorie at the same time as Benson, Hutton and Dr J.F. Bacon (see below), and many of the lots listed in the Boys collection represent Benson taxa collected from the type localities in this area. He is honoured in the names of several species and genera, including *Carychium boysianum* Benson, *Pseudonapaeus boysianus* (Reeve), *Boysia boysii* (L. Pfeiffer), *Boysidia* Ancey and *Paraboysidia* Pilsbry.

Lieutenant Colonel Robert Gordon (1808–1875) joined the Madras Army as a Cadet in 1829 and saw active service in various places including China during the early 1840s. In 1855 he was employed in the Public Works Department in Sangor and Narbudda territories, Jubbulpore division. During the early 1860s he and his wife were resident in Moulmein, Burma, where he collected several new species of land snail (*Helix*

brachyplecta and *Helix scenoma*) including one that Benson named after him (*Cyclotus gordoni*), and another that he named after his wife (*Hemiplecta gordoniae*). He was promoted to Lieutenant Colonel in 1861, the same year that he retired (Skelton and Bulloch, 1912: 287). On his return to England, Gordon settled in Surbiton (a suburb of south-west London) and began to correspond with J. Sydney Hawkins, with whom he exchanged shells. Gordon sent Hawkins a collection of Burmese land snails collected at Moulmein, together with a letter describing the circumstances of the discovery of the new species named by Benson (NHM Zoology Manuscripts ZOO_MSS_HAW). Some of these specimens were clearly collected at the same time as the type specimens sent to Benson but are not part of his type series (see remarks under individual species entries).

William Erskine Baker (1808–1881) rose to become a General in the military but is best known for his work as an engineer, especially his contributions to irrigation schemes. He was a subscriber and contributor to the *Journal of the Asiatic Society of Bengal*, which is possibly how he made his acquaintance with Benson, whom he provided with land snails from Sind. Two of these (*Bulimus estellus* and *B. pertica*) Benson described as new species. Little is known about three of Benson's other military contacts, **Lieut. G.W. Cox**, **Major Rowlatt** and **Col. Jenkins**, except that Cox found a gigantic specimen of *Helix basileus* at Nellyampatly and Jenkins (after whom *Lamellidens jenkinsianus* is named) and Rowlatt provided Benson with freshwater mussels from the Brahmaputra River in Assam. Several type specimens described by Hanley (1856) using material from Benson's collection (*Unio involutus*, *U. corbis*, *U. radula* and *U. scobina*) had originally been collected by Jenkins (Benson, 1862b: 186).

Far more is known about **John Colpoys Haughton** (1817–1887), who supplied Benson with material from various locations, most notably from the Andaman Islands and Burma. He also sent specimens to William Theobald, who used them to describe several new species himself (including *Cyclophorus haughtoni* Theobald, 1858) and passed others on to Benson for description. Haughton joined the Bengal Army in 1837 and was Adjutant of the 4th Gurkhas of Sha Shuja's force during the 1st Afghan War (1839–1842). He participated in the defence of Charikar, a town near Kabul, which was besieged by a huge Afghan force in November 1841. Haughton lost a hand during the siege, and after returning to the Afghan capital was taken hostage by Akbar Khan on 29th December 1841. He was eventually released in September 1842 and subsequently undertook regimental duties in the Andaman Islands and Assam, where he joined both the Khasi-Jaintia Expedition of 1863 and the Garo Expedition of 1872–1873. He also served as Commissioner of Cooch-Behar (1865–1873) and was appointed a Companion of the Star of India in 1866. He returned to Britain in 1873 and in 1882 was promoted to Lieutenant General. Benson named two Andaman Island endemics after him (*Helix haughtoni* and *Spiraxis haughtoni*), and another species from Burma (*Rhiostoma haughtoni*).

Another person who collected specimens for Benson on the Andaman Islands was **Dr James Pattison Walker** (1823–1906), a military doctor in the Bengal Medical Service. Following the Indian Rebellion in 1857, the Andaman Islands assumed an important role as a natural holding area for any rebels who were captured, especially as Indian prisons were full to capacity. Walker was chosen to be the first superintendent of the settlement and he arrived at Port Blair aboard an EIC steam frigate carrying 200 convicts on 10th March 1858. Walker developed a notorious reputation for the brutal way in which he dealt with prisoners under his charge and, although not officially censured, he was relieved of his post in 1859 and returned to a medical career in India. Indeed, Walker was replaced by John Colpoys Haughton (see above) as Superintendent of the Penal Settlement at Port Blair for a short period from 1859. While on the Andaman Islands Walker found the original specimens of *Helix choinix*, and Benson named *Spiraxis walkeri* after him.

Other naturalists

One other person should be mentioned in connection with the Andaman Islands. This was **Jan Vilém Helfer** (1810–1840), a naturalist born in Prague, who made extensive collections of insects, birds and plants from the Andaman Islands, Burma and the Mergui Archipelago (Wolcott and Renner, 2017). He had been hired by the EIC and was tasked to report on the natural resources of the Tenasserim provinces, which Britain had acquired as a result of the Anglo-Burmese war (1824–1826). He wrote a series of reports on his findings, noting that the timber trade was causing destruction of teak forests and that state intervention was needed to prevent further damage (Wolcott and Renner, 2017). He also visited the Andaman Islands, where he died in tragic circumstances when his party was attacked by a group of native islanders. Helfer, who was struck by an arrow while swimming back to his ship, was the only fatality. Although there are no records of specimens collected by Helfer specifically for Benson, they knew each other through the Asiatic Society of Bengal, both presenting papers at a meeting of that society on 7th December 1836 (Anon, 1836:

758). His major contribution to the natural history of the region was later commemorated by Benson in the name of an Andaman Island endemic (*Helix helferi*).

Benson's brief visit to Ceylon on his final journey back to Europe suggested to him that this island also supported many undescribed endemic land snails (Benson, 1851a). This prediction proved prescient and many undescribed species of land snail were subsequently discovered, especially by two members of the Layard family, Frederick Layard and his cousin Edgar Layard, both of whom shared an interest in natural history and then lived on Ceylon. **Frederick Charles Layard** (1823–1872), the third son of Charles Edward Layard, was born in Ceylon, where he spent much of his life working for the Civil Service as a Writer, Assistant Government Agent and District Judge. He was also the curator of conchology at the Museum of the Ceylon branch of the Royal Asiatic Society, which had been founded by Edgar (Layard, undated). Frederick, who had fostered Edgar's interest in snails (Naggs, 1997: 52), made a significant collection of land snails from Ceylon, which he donated to the BM in 1849 (NHMUK 1849.12.29.11–360). He remained a member of the Ceylon Civil Service until 1862 and died at the early age of 48 in Venice, Italy (Lewis, 1913: 293). Benson acquired specimens from both cousins (e.g. Benson, 1856d; 1860b), but it was Edgar who was to prove the most valuable contact.

Edgar Leopold Layard (1824–1900, Fig. 3B) came from a distinguished family of Huguenot extraction, who could boast of some 150 years' service to the British Crown. Edgar's father, Henry Peter John Layard, was a senior government official, who had lived for some time at Matara in the south of Ceylon before moving to Italy where Edgar was born. Other relatives held similar positions in the Colonial Service, including Sir Charles Peter Layard, who became the first Mayor of Colombo (1866–1893) and the Government Agent for the Western Provinces of Ceylon. Edgar was the youngest of seven sons. His eldest brother was Sir Austen Henry Layard (1817–1894), celebrated as the archaeologist who excavated Nineveh and who later became Ambassador to Constantinople. Other family members also shared an interest in natural history and archaeology, including Nina Frances Layard (1853–1935), one of the first women to undertake an archaeological excavation (White and Plunkett, 2004). Shortly after his marriage in 1845, Edgar travelled to Ceylon with his wife, Barbara Anne (née Calthrop), with the intention of starting work on a coffee estate managed by one of his cousins, but this venture failed and he eventually found alternative employment as an administrative assistant to a circuit judge (Layard, undated; Naggs, 1997). He studied law and qualified as a barrister and was eventually appointed the Sheriff and Magistrate of the Point Pedro District in the north of Ceylon, before finally obtaining a senior administrative post in Colombo (Naggs, 1997). After nearly a decade in Ceylon, both he and his wife were forced to return to England for health reasons. He was an accomplished field naturalist, with particular interests in entomology and ornithology (Layard, 1853), although he soon became fascinated by the local snails about which he became quite knowledgeable. However, he had been discouraged from describing new species (Naggs, 1995) and, although he could easily have done so, he chose to pass on his new land snail specimens to Benson for formal description (e.g. Benson, 1853c, 1856c). He did, however, describe several species of freshwater snail (Layard, 1849, 1855).

The fieldwork conducted by the Layards greatly improved the knowledge of the molluscan fauna of Ceylon, but Benson (1856d) still regarded it as essentially Indian, with close links to the fauna of the Western Ghats (see Raheem et al., 2014). Benson provided this new information to **Samuel Pickworth Woodward** (1821–1865), who was assembling biogeographical data for his *Manual of the Mollusca* and who fully recognized the distinctive character of the Sri Lankan snail fauna, defining it as a separate province of the Indian region (Woodward, 1856a). William Blanford, however, remained sceptical, taking the view that "there can be no rational doubt that, with the further exploration of the South-Indian hills, the claims of those of Ceylon to be considered a distinct zoological province will completely vanish" (Blanford, 1864: 22). The snail faunas of India and Sri Lanka undoubtedly share common origins but, in addition to a high level of endemism, Sri Lanka possesses several species of acavids, Gondwanan relicts that are absent from India (Naggs and Raheem, 2005).

In December 1854, Edgar Layard moved to the Cape Colony (South Africa) to work as private secretary to the Governor, Sir George Edward Grey (1812–1898). From 1855 he began to collect natural history specimens, especially birds, for the South African Museum, Cape Town, where during his spare time he became their first curator (Layard, undated; Summers, 1975). He moved into the curator's quarters but the poverty of the museum at that time is emphasized by the fact that he was expected to pay a very considerable amount out of his own pocket towards the costs of creating the museum of which he was curator. Shortly after his arrival in South Africa he began to make detailed notes of the birds that he encountered, which he eventually collated into a book

(Layard, 1867), providing one of the early accounts of the avifauna of that region.

After leaving South Africa, Layard had posts in Brazil, Fiji (where he was administrator to the Government), New Caledonia (Honorary British Consul) and New Zealand (private secretary), and he travelled widely (with his son E.L.C. Layard) to many other locations in the Indo-Pacific (Mennell, 1892). He continued to collect specimens in these places (mostly birds), but much of this activity occurred after Benson's death. He therefore only provided Benson with shells from Ceylon, South Africa, St Helena and the Cape Verde Islands. Benson subsequently described several species of land snail from Ceylon (e.g. *Spiraxis layardi*, *Streptaxis layardiana* and *Vitrina edgariana*) and South Africa (*Pupa layardi*) after Layard, and he was similarly honoured by other people who commemorated his name in that of a beaked whale (*Mesoplodon layardii*), a bird, Layard's tit-babbler (*Sylvia layardi*), a squirrel (*Funambulus layardi*) and an endemic Sri Lankan skink (*Nessia layardi*).

Benson also had dealings with the naturalist **Frederick Strange** (1826–1854), celebrated for his collecting in Australia and New Zealand, who was killed by Aboriginal peoples on a collecting expedition to Percy Island, Queensland, in 1854 (Hedley, 1906; Whittell, 1947; Comben, 2017). Strange, who supplied shells to many notable 19th century collectors such as Hugh Cuming and the Sowerbys, briefly returned to Britain in 1852, giving Benson the opportunity to examine his collections, from which he obtained specimens of what he later named *Diplommatina australiae* (Benson, 1852b: 351, 1853d: 286, 1855d: 331).

Finally, the celebrated Cornish naturalist **Jonathan Couch** (1789–1870) appears to have acquired specimens from Benson, who had links to Cornwall and visited the county on each of his return trips to England in 1832 and 1848 (see Appendix 1), writing at least one of his papers in Falmouth (Benson, 1848a). He also deposited his Will with a Cornish solicitor just before departing for India in 1834 (see below). Parts of Couch's extensive natural history collections were donated to the BM in 1870, including his shell collection, amongst which are several Indian species described by Benson. Given that Couch never visited India, and his collection was otherwise formed of predominantly British species, it seems likely that Benson was the source of this material.

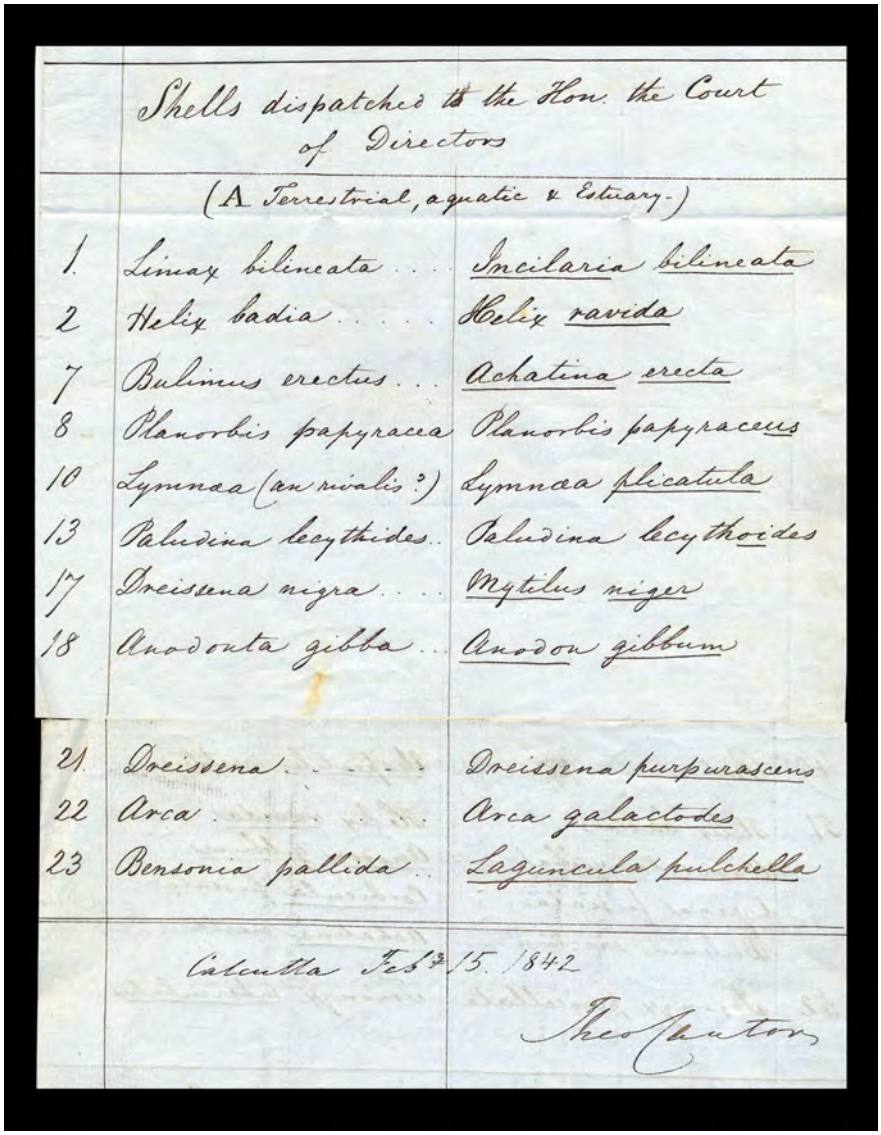
Physicians

Several physicians also became important contacts. One very early contact was **Dr Henry Chapman**, who in 1836 had been tasked with exploring the possibility of establishing a hill station sanitorium at Darjiling. As part of this enterprise, he was provided with meteorological instruments in order that he could make an accurate assessment of the climate of any locality proposed for a sanitorium. The data from Darjiling, where the sanitorium was eventually established, were published by the Asiatic Society (Chapman, 1837) and as an Appendix to a monograph on "Dorjé-ling" (Chapman, 1838). Once established in Darjiling, Chapman began assembling "an interesting collection made for Mr Benson" that included "forms peculiar to the *Siccim* mountain forests, as well as others met with at both extremes of the Indian *Himalaya*" (see Hutton and Benson, 1838: 217; Benson, 1854b).

Dr William Bland, Surgeon of HMS *Wolf*, was another medical contact during the 1830s. He provided descriptions of two new species of *Pterocyclos*, although he did not formally name them (Bland, 1836), together with illustrations that were never published by the *Journal of the Asiatic Society of Bengal*. Benson, who was hoping to see these shells, did nothing for several years until he came to realize that Bland was unlikely to publish anything further. Benson's (1851d) descriptions of *P. blandi* from Malaysia and *P. troscheli* from Ceylon were therefore based entirely on Bland's notes and his own sketches of Bland's unpublished drawings, which he had been shown some years earlier. Apart from natural history, Bland is also known for his transcription of the surviving text inscribed on the Singapore Stone (Prinsep, 1837) before its destruction in 1843.

Dr Thomas Claverhill Jerdon (1811–1872) was an Assistant Surgeon in the Madras service (1835–1864) and a keen natural historian with a particular interest in birds, mammals and plants (Fig. 3C). He wrote several books on the birds and mammals of India and is credited with laying the foundations for the *Fauna of British India* series (see below). In 1841 he visited the Nilgiri Hills in the Western Ghats and made important collections of land snails from this biodiversity hotspot, which he sent to Benson for description. Jerdon has the unusual distinction of having a genus of plant and land snail named after him, both called *Jerdonia*. Several other species of land snail bear his name, as well as a few species of mammal, such as the Brown Palm Civet (*Paradoxurus jerdoni*). However, perhaps his best-known discovery was that of a rare nocturnal bird from southern India that became known as Jerdon's Courser (*Rhinoptilus bitorquatus*). Since its discovery by Jerdon in 1848, this bird had only been seen a few times up until 1900 and was presumed extinct until its rediscovery around Lankamalai in 1986 (Bhushan, 1986).

Dr John Fergusson Bacon (1806–1854), a physician with the Bengal Medical Service who served



Shells dispatched to the Hon. the Court of Directors

(A Terrestrial, aquatic & Estuary-)

1.	Limax bilineata	Incilaria bilineata
2	Helix badia	Helix ravida
7	Bulimus erectus . . .	Achatina erecta
8	Planorbis papyracea	Planorbis papyraceus
10	Lymnaa (an rivalis ?)	Lymnaa plicatula
13	Paludina lecythides . .	Paludina lecythoides
17	Dreissena nigra	Mytilus niger
18	Anodonta gibba . . .	Anodon gibbum
21	Dreissena	Dreissena purpurascens
22	Arca	Arca galactodes
23	Bensonia pallida . .	Laguncula pulchella

Calcutta Feb^{y} 15. 1842

Theo Cantor

FIGURE 6. Extract from a catalogue prepared by Theodore Cantor in February 1842 listing shells transferred to the EIC's India Museum in London, including many that had been described by Benson from Chusan.

as Assistant Surgeon (and also later Postmaster) of Moradabad, was another regular source who supplied Benson with land snails from Australia, Borneo, Singapore and India. Benson also enjoyed several collecting trips in different parts of India with "my friend, Dr Bacon" whom "he had first imbibed" with his taste for natural history. As well as conchology, they both also shared a passion for entomology, and Benson named a species of beetle after Bacon (*Paussus baconi* Benson, 1846), later noting that Bacon's "collection of species, in all the orders, amounts now to 3716, of which 2103 are *Coleoptera*" (Benson, 1847: 32). Bacon discovered several important molluscan species, including *Camptoceras terebra* in deep water on "the wide alluvial bed of the Ramgunga north of the station and race-course of Moradabad" (Benson, 1843), and the unique specimen that Benson named "*Helix baconi*" collected from a bush on the bank of the Gungun River, near Moradabad (Benson, 1850b). Benson also described several new species of land snail from Australia using specimens provided by Bacon. Bacon's own shell collection was sold in 1856 by Stevens' auction house in Covent Garden (Chalmers-Hunt 1976: 96) and appears to have been purchased by Hugh Cuming, who frequented these sales (Melvill, 1895: 64). Several specimens labelled "Bacon" are present in the Cuming collection, purchased by the BM in 1866, some of which may have been collected at the same time as the specimens sent to Benson.

Dr John Thomas Pearson (1801–1851) was a doctor in the Bengal Medical Service, although he assumed part-time curatorial responsibilities at the Museum of the Asiatic Society in Calcutta for a period during the mid-1830s before they appointed a

permanent curator (Mathew, 2015). He published some supportive remarks in response to one of Benson's first published articles on *Ampullaria* (Pearson, 1830) and at least one paper on molluscs in which he described new taxa (Pearson, 1833a). He also supplied numerous specimens to Benson and others for description: *Cyclostoma pearsoni* from the Khasia Hills was named after him by Benson, and the cyclophorid genus *Pearsonia* was also named in his honour by Kobelt (1902: 171). Pearson was also instrumental in establishing an agreement with **Dr Thomas Horsfield** (1773–1859), a celebrated naturalist and curator of the EIC's India Museum in London, to supply natural history specimens from the Asiatic Society to the India Museum (Correspondence, ZOO_MSS_IND; see also Desmond, 1982; MacGregor, 2017). These consignments included some of the Asiatic Society's type material described by Benson in the 1830s (see below). Pearson's offer was not entirely altruistic, as he revealed in a letter to Horsfield that, in order to fulfil his side of the bargain, he would require his support in order to remain in Calcutta "without lots of work in the service", rather than being promoted to a more onerous post elsewhere (ZOO_MSS_IND).

One of Benson's medical contacts proved to be especially valuable in supplying him with material from Asian localities outside India, and especially from China. **Dr Theodor Edvard** (anglicized to **Theodore Edward**) **Cantor** (1809–1860) was a Danish physician who travelled to India to work in the Bengal Medical Service in 1835. Cantor's uncle, **Nathaniel Wolff Wallich** (1786–1854), was heavily involved in the establishment of the Asiatic Society Museum in 1814 (which would later become the Indian Museum) and served as its first curator before becoming Superintendent of the EIC's Botanic Garden in Calcutta. He was consequently well known in scientific circles in both India and Europe. Theodore, like his uncle, had a keen interest in natural history and once settled in India he began to investigate its fauna, especially its reptiles, amphibians and fishes. The year after his arrival in India, he was responsible for the description of one of that country's iconic animals, *Ophiophagus hannah* (Cantor, 1836), the King Cobra. He was a member of Council of the Asiatic Society of Bengal when **J.W. Laidlay** (1808–1885), of *Helix laidlayana* fame, was its Secretary (1846–1847) and, together with others, reported on the poor state of the natural history collections in the Asiatic Society Museum and the inadequate care of the shells provided by **Edward Blyth** (1810–1873), the curator recruited from Europe (Grant et al., 1848; Naggs, 1997).

In 1840 Cantor volunteered for military service for the chance to visit China and investigate its poorly known fauna. Indeed, he was requested by Lord Auckland, the Governor-General of India, to use the opportunity to collect specimens for the EIC. He served as Assistant Surgeon/naturalist on the Expeditionary Force sent to browbeat the Chinese into accepting imports of opium during the First Opium War (1839–1842). He travelled from India to China via Penang (Malaysia) and Singapore and from July to November 1840 conducted a detailed zoological survey of the Chinese island of Chusan (now Zhoushan). Despite spending only four months on the island, being forced to leave through illness, he managed to amass a considerable number of specimens requiring identification and description. He sought assistance from William Griffith with the identification of the plants, Edward Blyth with the birds, Frederick Hope with the insects and William Benson with the molluscs. A list of molluscs from Chusan that were transferred to the EIC's India Museum in London was drawn up by Cantor in February 1842 (Fig. 6). Later that year Cantor published an account of the fauna and flora of Chusan spread across three issues of the *Annals and Magazine of Natural History* (Cantor, 1842a), which included contributions from the various specialists including one on the molluscs (Benson, 1842b). This overview was subsequently published as a reprint in book form, with Cantor's own beautiful colour illustrations of representative species drawn from life (Cantor, 1842b). The account published in 1842 included only Benson's Latin descriptions and a few cursory notes in English, but an expanded version with additional notes on habitat provided by Cantor eventually appeared in 1855 (Benson, 1855a), although this had evidently been written in 1841. Cantor also submitted work on Chusan for publication elsewhere, but for various reasons this was much delayed and did not appear as intended (Turner, 2016). Cantor continued his career in the Bengal Medical Service with a posting to Penang as Civil Surgeon, enabling him to investigate the fauna of the Malay Peninsula. His last appointment was as Superintendent of the European Asylum at Bhowanipur (Turner, 2016). Cantor died at sea in March 1860 "whither he had been sent for a change of air", causing Benson to comment that "He was indefatigable in his profession; and his researches have added largely to our knowledge of the natural history of Asia" (Benson, 1860e).

One of Benson's later medical contacts was **Dr Francis Day** (1829–1889), who was a prominent ichthyologist and a Fellow of both the Zoological and Linnean societies. The southern Indian shrew *Suncus dayi* was named after him. Day qualified in medicine in 1851, joining the Madras Medical Service the following year and serving in the second Burmese

War. He became Inspector General of Fisheries in India and Assistant Surgeon General, from which post he retired in 1876. In the early 1860s Day made a collection of land snails from Travancore, amongst which were two species later described by Benson (*Helix basilessa* and *Helix anax*). Like Benson, Day also spent time in Cheltenham, giving his address in the BM register as "Andover Lodge, Cheltenham", so it is probable that they met there in the mid-1860s.

Geological Survey of India

Benson also had important relationships with members of the Geological Survey of India (GSI), although that organisation, formed by the EIC in 1851, did not exist while he was resident in India. Several of these contacts (Fig. 7) were destined to become the next generation of malacologists working in India. In 1850 **Thomas Oldham** FRS (1816–1878), who had been Local Director of the Geological Survey of Ireland and Professor of Geology in Dublin, was recruited by the EIC to head the newly established GSI. On arrival in India in March 1851, Oldham found that there were no field geologists on the staff, which then consisted of just two people, both occupying clerical positions (Auden et al., 1951; Leviton and Aldrich, 2004). He therefore began to recruit suitable staff and to formulate research programmes.

Amongst the first recruits to join the GSI was **William Theobald** (1829–1908). Little is known of Theobald's early life, although he is often cited as "Wm. Theobald, junior", leading some to suggest he had American origins (Mabberley, 1985). He had arrived in Calcutta on the S.S. *Hindostan* via Suez in March 1847 (*Bengal Directory* 1848: 486), the month before Benson retired and returned home to Europe. He was initially engaged in the geological exploration of



FIGURE 7. Staff of the Geological Survey of India in about 1872, including some well-known malacologists. Many collected animal and plant specimens while engaged in their survey work, supplying shells to Benson, Theobald, Stoliczka and others for description. Standing (left to right): Ferdinand Stoliczka, Robert Bruce Foote, William Theobald, Frederick Richard Mallet, Valentine Ball, Wilhelm Heinrich Waagen, Walter Lindsay Willson. Sitting (left to right): Ambrose Tween, William King, Thomas Oldham, Henry Benedict Medlicott and Charles Augustus Hacket (from Auden et al., 1951).

the upper Damooda and Son (Soane) valleys in India under David Williams and was subsequently appointed assistant to John McClelland after Williams's death from malaria in 1849. In 1855 Theobald moved to Burma, where he took charge of the Pegu Survey. This posting allowed him to collect land snails extensively in the Tenasserim Valley and elsewhere. He supplied Benson with numerous specimens (e.g. Benson, 1856e, 1859e, f) but also provided his own accounts of the fauna (e.g. Theobald, 1857, 1858, 1859, 1876a, 1876b). Theobald's zoological expertise also included herpetology, which led him to publish the first detailed accounts of the reptiles of "British Birma" (Theobald, 1868a) and "British India" (Theobald, 1876c), as well as to catalogue the reptiles in the Asiatic Society's collection (Theobald, 1868b).

Theobald also made his collection of shells available to the **Reverend Francis Mason** (1799–1874) for early editions of his great work entitled *The natural products of Burmah, or notes on the fauna, flora and minerals of the Tenasserim provinces, and the Burman empire* (Mason, 1850). Mason, a British-born American Baptist missionary based in Burma, had previously written a short account of the land snails that he had collected in the Tenasserim Provinces (Mason, 1848), which elicited a critical response from Benson (1849b). The third edition of Mason's book, handsomely printed with wide margins and bound into two volumes, was enlarged and completely rewritten by Theobald as *Burma, its people and productions; or notes on the fauna, flora and minerals of Tenasserim, Pegu and Burma* and was published by order of the Chief Commissioner for British Burma (Theobald, 1882–1883). By this time Theobald had become Deputy Superintendent of the GSI. In recognition of his valuable contributions, the caenogastropod genus *Theobaldius* was named in his honour by Nevill (1878), and several other species of land snail were named after him by Benson (e.g. *Cyclophorus theobaldianus*, *Camptonyx theobaldi* and *Streptaxis theobaldi*). Theobald also had a keen interest in plants and, as part of correspondence concerning the unusual foot of the land snail *Otopoma clausum*, sent Benson examples of thin-stemmed plants on which the species was known to climb (Benson, 1859j: 92). Benson duly had these identified by **Sir William Jackson Hooker** (1785–1865), the first Director of the Royal Botanic Gardens at Kew. Theobald knew several other eminent botanists, including **Joseph Dalton Hooker** (1817–1911), who succeeded his father as Director at Kew. The pair spent time in the field when Hooker visited the Himalaya and India between 1847 and 1851. Theobald had a particular interest in taxonomy and was an early advocate of priority in specific epithets in the face of British colonial botany, validly publishing some 26 binomials for Burmese plants, an act for which he has been considered an unwitting reformer of botanical nomenclature (Mabberley, 1985).

Theobald also collaborated with **Sylvanus Charles Thorp Hanley** (1819–1899) on their monumental work *Conchologia Indica*, which set out to review the non-marine molluscan fauna of British India, including Burma, Nepal and Ceylon (Hanley and Theobald, 1870–1876). The plates were prepared by G.B. Sowerby the younger, who was the best illustrator of his time, especially of conchological works. However, in their preface Hanley and Theobald regretted that some of the figures of the more minute species were not as well executed as they had expected, noting that "lithography is scarcely compatible with sharp definition, and to correctly magnify such little objects strains the eyesight to an extent few artists will dare to venture". *Conchologia Indica* was never intended to be comprehensive but "merely to assemble in one book species which were dispersed in scores of other volumes". The partnership between Hanley and Theobald proved to be extremely frustrating for Theobald because the two authors were based in different parts of the world and Lovell Reeve, the publisher, declined to provide proofs to Theobald in India. Moreover Theobald, who had undertaken much of the relevant fieldwork, did not always agree with Hanley's taxonomy and complained that details of many Indian localities had become garbled, a problem that Theobald attributed to the fact that Hanley had never visited India. Theobald consequently felt compelled to issue a supplement in which many of the errors in *Conchologia Indica* were corrected (Theobald, 1876a; see also Theobald, 1878: 145), although this supplement was also heavily criticized (Blanford, 1880: 182–183). Theobald retired from the Survey in June 1881 and returned to England, where he spent time at Bembridge on the Isle of Wight before moving to Devon, where he died at Ilfracombe on 31st March 1908. His main collection of Asian land and freshwater molluscs, which contains numerous type specimens and shells from the type localities of Benson's species, was purchased by the BM(NH) in 1888 (NHMUK 1888.12.4.1–2114), but other material survives in the UMZC, the National Museum of Wales, Cardiff, Bristol Museum and Art Gallery and in the Indian Museum (now in the ZSI). Another part of it was acquired by **Miss Juliana Emma Linter** (1844–1909), a notable shell collector who incorporated it into her own collection now in the RAMM, Exeter (Morgenroth et al., 2018).

William Thomas Blanford (1832–1905, Fig. 3D) and **Henry Francis Blanford** (1834–1893, Fig. 3E) were brothers who both trained at the Royal School of Mines in Jermyn Street (now part of Imperial College London) under Henry de la Beche, Lyon Playfair and Edward Forbes. They subsequently obtained posts in the GSI in 1855 under Thomas Oldham. On arrival in India, they spent their first field season (1855–1856) with William Theobald, surveying the Talcheer [Talchir] coalfield in Orissa, which provided the basis for a stratigraphical subdivision of Indian coal-bearing sequences (Blanford et al., 1856). They also recognized the effects of glacial activity in the boulder bed now known as the Talchir tillite, thereby providing some early evidence for a Permian glaciation in the Southern Hemisphere (the Gondwana glaciation). Indeed, the term "Gondwana", meaning 'land of the Gonds' (a tribe who once ruled a kingdom in central northern India), was first used in a geological context in 1872 by **Henry Benedict Medlicott** (1829–1905), their colleague (Fig. 7) who would later become Director of the GSI.

The Blanford brothers subsequently undertook fieldwork in other regions, leading to new perspectives that challenged several conventional European positions, including the non-contemporaneity of similar palaeofloras in Europe and Southeast Asia, a terrestrial rather than marine origin of flood basalts, the recognition of rivers as agents of deep erosion in tropical and arid regions, and a Permo-Carboniferous link of India, Australia and southern Africa (Leviton and Aldrich, 2004). Henry, while still retaining an interest in geology (e.g. H.F. Blanford, 1875), subsequently became Meteorological Reporter to the Government of India, with the object of organizing a comprehensive pan-Indian system of data gathering, analysis, and dissemination (Grout, 2004). Meanwhile his elder brother became a distinguished geologist, undertaking often arduous fieldwork not only in India but in Burma, Abyssinia, Baluchistan, Tehran, the Alborz Mountains and the Caspian Sea (Anon., 1905; Moore, 2004; Leviton and Aldrich, 2004). William was also one of the most active agents in the foundation of the Indian Museum as a Government institution and also in the negotiations connected with the first zoological work of the *Investigator*, a marine survey ship designed to undertake work in the Indian Ocean following the success of the voyage of the *Challenger* (Anon, 1914). Both brothers were active in the Asiatic Society, Henry serving as Secretary (1863–1868) and subsequently as President (1884), whereas William had been President just a few years earlier (1878–1879). They were both fellows of the Geological Society of London (William was President from 1888–1890) and Fellows of the Royal Society, William being elected FRS in 1874 and Henry in 1880. The Blanford brothers sent numerous land snails to Benson for description (e.g. Benson, 1859g and h), for which they were honoured in the usual way (e.g. *Diplommatina blanfordiana*, *Streptaulus blanfordi*), but from the 1860s they also began to describe material themselves (e.g. Blanford and Blanford, 1860, 1861, 1862–1870). William, in particular, was especially prolific in this regard and was responsible for introducing the names of several genera and many species of land snail from various parts of India, Burma, Ceylon and the Andaman Islands. He also had a keen interest in biogeography and argued that Earth history profoundly affects patterns of distribution of animals and plants, challenging the notion of determinate zoogeographic realms as advocated by **Alfred Russel Wallace** (1823–1913) in his *Geographical distribution of animals* (Blanford, 1876a, b, 1901). After his retirement from the GSI due to ill health in 1882, William Blanford continued to publish articles on a range of subjects, including one highlighting the importance of a great glacial epoch at the close of the Palaeozoic and the large biotic turnover that occurred around this time (Blanford, 1886). He also became the editor of the early volumes of the monumental series *Fauna of British India* (1888–1943), contributing sections on mammals and birds but dying in 1905 before he could complete the section on molluscs.

H.H. Godwin-Austen's contribution and the *Fauna of British India* Series

Building on the work begun by Benson and his early scientific network, the contribution of **Henry Haversham Godwin-Austen** (1834–1923), the last significant figure in the golden age of malacology in British India, merits special mention. Compared with Benson, we know a great deal more about Godwin-Austen's fascinating life from his surviving diaries, letters, manuscripts and artwork. Importantly, he also went to great lengths to safeguard his malacological collections for future generations. A detailed biography focused on his mountaineering exploits and family history (Moorhead, 2013) contains relatively little insight into the importance of his scientific collections or related research.

Godwin-Austen (Fig. 3F) was the eldest of 17 children of the celebrated geologist Robert Alfred Cloyne Austen and his wife Maria (née Godwin). As landed gentry on the fringes of the aristocracy, his family had political influence with extensive scholarly and military connections. This greatly facilitated Godwin-Austen's early career opportunities, allowing him to develop his undoubted and outstanding

capabilities. He was a competent artist, particularly of landscapes, the painting of which became an integral part of his survey work. He also took a keen interest in the cultures, religions and architecture that he encountered, and often included these as subjects of his artwork. His broad and passionate interest in natural history extended to palaeontology, geology and physical geography, subjects that were all well served by his artistic skills.

Godwin-Austen's maternal grandfather, General Sir Henry Thomas Godwin, was set on directing him to a military career. Haversham, as Godwin-Austen was known, was admitted to Sandhurst Military Academy aged thirteen, gaining his commission three years later. His first posting was in Burma and he sailed for Rangoon in 1852 via Cape Town and Calcutta. His career had an inauspicious start, his departure being delayed by a serious riding accident in Calcutta in which he broke his leg. He then contracted smallpox on the ship, although he had recovered sufficiently when he arrived in February 1853 to take up the position of aide-de-camp to his grandfather. The months spent on this first visit to Burma allowed him to experience the wonders of tropical biodiversity, pursue his interests in natural science and develop his landscape recording skills. Godwin-Austen did not see significant military action since the Second Burmese War and the succession of Pegu were largely over before his arrival in Burma. On completion of his military campaign, General Godwin was recalled to India where, together with his grandson, he travelled up to the summer capital, Simla. It was there that General Godwin died on 26th October 1853 following an acute episode of fever and dysentery. In the absence of his grandfather's patronage, at a time when career development greatly depended on such support, things became uncertain for Godwin-Austen. In November his regiment was initially deployed to Sialkot in the Punjab, before being posted to Peshawar. From Peshawar he was sent to the then independent state of Kashmir to join a team of the Great Trigonometrical Survey of India, run by the military. His skills had been recognised, and while lobbying from his father may have influenced events, he was to prove his worth. This was Godwin-Austen's forte, something he could wholeheartedly embrace, and he was formally appointed to the Survey in 1857. He overcame the occasional sense of disenchantment that the extreme demands of surveying understandably generated. Such rare reservations should be viewed in the context of the need to be in excellent health in order to carry out pioneering, frequent and protracted surveys at the limits of human endurance. Throughout his career Godwin-Austen's diaries often refer to his being plagued by gastrointestinal infections, bouts of malaria and no doubt other mosquito-transmitted pathogens, tick-borne and other tropical diseases. Nevertheless, to achieve what he did, Godwin-Austen must have been exceptionally fit, at least for the most part. With accompanying determination, he undertook extremely demanding surveys in the most inhospitable terrain with the minimum of basic equipment, occasionally scaling mountains in excess of 20,000 feet [6,096 m].

Godwin-Austen experienced relatively little military action, his most dangerous encounter being an attack by a mob in November 1858, allegedly linked to the Indian Rebellion of the previous year. The attack was serious enough to require hospitalization, leading him to return to England in April 1859 to complete his recuperation. Moorehead (2013: 87) has speculated that the location and timing of the attack on Godwin-Austen suggests that its true motivation might have been retribution perpetrated or instigated by relatives of his first wife, Kudikji. She was the daughter of a land-owner from Poonch, Jammu and Kashmir, and probably a member of the Sudhama community of Afghan origin. Their marriage in May 1858, which was only made possible by Godwin-Austen adopting Islam, would certainly have presented difficulties for both of them in their respective communities and was further complicated by their having had an illegitimate son, Edward, who was born in March 1857 (Moorehead, 2013: 83). Godwin-Austen later gave the year of Edward's birth as 1859 (letter to Mrs H. Barclay, 12th June, 1923, see Moorehead, 2013: 216–217), which was either a mistake or an attempt to legitimise the birth. Kudikji accompanied Godwin-Austen in August 1860 on his field season in Baltistan, the mountainous area in Kashmir just south of the Karakoram range known as Little Tibet. Nothing is known of her subsequently and their short-lived marriage appears to have been passionate and intense. She presumably died before the end of 1860, although this is not certain and her fate is unknown (Moorehead, 2013: 86). Regardless, by the winter of 1860 Godwin-Austen had met seventeen-year-old Pauline Plowden, to whom he was married in April 1861 (Moorehead, 2013: 120–129). This speedily-arranged and apparently disastrous second marriage resulted in two sons, Alfred (who died after only a few weeks in 1862) and Arthur, born in September 1863.

Godwin-Austen then embarked on several explorations in the Karakoram ranges, Ladakh and into Tibet. The only European on these surveys, he led teams of sixty or so locally recruited assistants, surveying the huge valley glaciers at the base of Mount Godwin-Austen (K2), the second highest mountain in the world, the height of which he measured and

position fixed. For a discussion relating to the naming of Mount Godwin-Austen, provisionally named K2 because it was the second peak measured in the Karakoram Range, see Moorehead (2013: 186–188). Described as "probably the greatest mountaineer of his day" (Mason, 1955), he collected geological and zoological specimens in many remote mountainous regions of India and was one of the first to search the Siwalik range of Himalayan foothills for fossil evidence of their formation (Mason, 2004). His enquiring mind considered numerous issues relating to evolution, Earth history and biodiversity loss. For example, he recognised the significance of Eocene marine fossils discovered by Joseph Hooker in 1849 in Dongkha La, north-eastern Sikkim, understanding their importance for recognising the age of the Himalaya (Godwin-Austen, 1921a). Writing to a local newspaper in 1899 (Moorhead, 2013: 177), he expressed concern about the depletion of the local biota in Surrey and was remarkably perceptive in anticipating that large-scale global extinctions were in prospect. He commented: "One of the saddest things after a visit to the Zoological Gardens at the Regent's Park is the thought that in 50 to 100 years so many of the beautiful animals and birds there will have ceased to exist".

He began collecting molluscs seriously in 1862 and sent specimens from Skardu, Kashmir (currently in Pakistan-administered Gilgit–Baltistan) to S.P. Woodward at the BM for examination (Godwin-Austen, 1899: 243; see also Archer, 1864), although Woodward's health had by then deteriorated and it appears that he was unable to do so before his death. He was forced to turn back after entering Tibetan territory in 1863, but not before he had noted the occurrence of planorbids, lymnaeids and a *Pisidium* shell in the saline water of Lake Pangongon on the Tibetan plateau (Moorehead, 2013: 110). He was then sent east to accompany political and survey missions to the opposite side of the Himalaya, initially to the independent Kingdom of Bhutan. The eastern Himalayan terrain was very different to that of the northwestern Himalaya. Annual rainfall generally increases from west to east across the Indian Himalaya, supporting increasingly dense rainforest habitats, quite unlike the much drier, seasonally colder and generally open environment of the northwestern Himalaya and its foothills. The valleys through Bhutan and what is now the Indian state of Arunachal Pradesh to the east possessed dense and extensive canopied forest, including dipterocarps, with stands of massive trees that are in India now much degraded. At their most southerly extent, ~360 km north of the Tropic of Cancer, these forests nevertheless exhibit a rich botanical diversity including *Cyathea* tree-ferns, bananas and palms. This floristic diversity, famously explored by Hooker (1854) and in the 20th century by Frank Kingdon-Ward (Lyte, 1989), was matched by a rich diversity of land snails. The relative paucity of the predominantly Palaearctic land snail fauna in the northwestern Himalaya gives way eastwards to an increasingly diverse Indo-Malaysian one. For the next five years Godwin-Austen surveyed in the Khasi Hills and the Burrail Ranges in current day Meghalaya and Assam before his health became "seriously broken", forcing him to return to England on furlough in 1870 with his son, Arthur, who was destined for boarding school there. His wife Pauline, who was also unwell, was left behind in Calcutta, where she died in their absence in 1871.

On his return to India in 1872, Godwin-Austen was posted to the frontier regions of the far northeast (now eastern Arunachal Pradesh, Nagaland, Manipur and Mizoram) and to Upper Burma (now Chin, Sagaing and Kachin States). Much of the survey work involved climbing a succession of peaks and spending long hours waiting for colleagues to signal their readiness to take readings from adjacent peaks. At these high altitudes, rainfall was far more frequent than on the surrounding lower terrain, providing ideal conditions for collecting snails and semi-slugs, which emerged following the rain. Godwin-Austen was presented with an abundance of molluscs for examination and collection, relieving the long and tiresome waiting required by the survey work. He used every opportunity to build collections of land snails, an enthusiasm that came to be shared by several of his surveying team (Godwin-Austen, 1899). These densely forested, roadless, hilly and mountainous regions were peopled by diverse tribal groups, some of whom were notorious head-hunters, a practice that continued in Nagaland until the 1960s (Tinyi, 2017; Werner, 2021). However, the greatest threats remained the rampant and virulent diseases endemic to the region. Godwin-Austen became progressively worn down by a succession of potentially lethal fevers that also exacted a heavy toll on his survey colleagues. His final field season (1874–1875) was conducted in the Dafla Hills that range north of the Brahmaputra in what is now western Arunachal Pradesh. He took a short period of sick leave in England in 1876 and, following a brief return to Calcutta, decided to resign on the grounds of poor health. This was accepted, and he retired with the rank of Lieutenant Colonel. He transferred briefly to the Indian Museum, where he organized the bird collections, before finally leaving India in 1877.

Godwin-Austen's health recovered after his return to England and he was able to establish himself as a member of English society. He married Jessie Robinson

in 1881 and had at last found a contented relationship in his third marriage. He settled into the life of a local squire, involved with local affairs. He was a local Conservative councillor and engaged in numerous local committees involving the church and school. On the death of his father in 1884, he inherited the family estate, including the main residence, Shalford House and Park, together with other properties and land. With over 70 rooms and an extensive complement of staff, Shalford House was a massive financial burden for which the family lands no longer generated sufficient income. The Great Depression of British Agriculture had been felt for about a decade. It became progressively worse with numerous landed families enduring financial collapse. This followed from the opening up of the American prairies, the advent of cheap and rapid steamship transportation and the consequent fall in grain prices. He filed for bankruptcy in 1898 but on the sale of Shalford House and much of its contents he was soon able to discharge the bankruptcy and moved to a still substantial estate property, Nore House (now Cobblestone House), south of Godalming, Surrey. Nevertheless, financial worries seemed to have plagued Godwin-Austen for the rest of his life, and he remained rich in assets but with a limited income.

Following Jessie's death in 1913, age and infirmity increasingly took their toll and Godwin-Austen visited London less frequently and concentrated on farming his estates and studying the snail collections that he had taken to Nore. As an elderly pillar of the establishment and exemplar of traditional early 20th century values in England, his life was far removed from his early days on the Northwest Frontier. It is possible that his past was an open secret and the subject of widely circulated gossip. However, it is more likely that his first marriage to Kudikji, adoption of Islam and the fact that his son Edward was given up for adoption may have been closely held family secrets. Edward died in 1917, which might have closed that early episode of Godwin-Austen's life since there was no written record of it in any of Godwin-Austen's surviving diaries or correspondence. However, Edward had married and had 15 children. One of his daughters visited England and tried to contact Godwin-Austen but received only a letter from his solicitor in response. A second daughter wrote to Godwin-Austen from near Delhi in May 1923, to whom he responded acknowledging that he was her grandfather and detailing all that we know of his marriage to Kudikji. However, when she happily wrote back addressing him as grandfather, he coldly informed her that she must not do so and that he preferred her to address him as Colonel Godwin-Austen (letter to Mrs Barclay 6th October, 1923, see Moorehead, 2013: 220–221). This was the last contact that Godwin-Austen had with this branch of the family before his death two months later.

One final aspect of Godwin-Austen's life that has led to speculation was his apparent interest in Buddhism. He had doubtless seen many of the numerous archaeological remains of Buddhist culture on the Northwest Frontier and witnessed it in the regions that he surveyed from Sikkim, through Bhutan and to the west and in areas of Burma as a deeply rooted belief system. He was clearly interested in Buddhist beliefs, culture, architecture and art, but despite assertions to the contrary (Moorehead, 2013: 212–215; Kingsley, 2017), there is no substantial evidence to support claims that he ever converted to Buddhism.

During the years spent surveying in northeast India and Upper Burma, between 1863 and 1875, Godwin-Austen accumulated an enormous collection of land shells and preserved specimens that has not been matched to this day. Furthermore, many of the habitats in which he collected have been severely degraded or destroyed, making his material all the more valuable. On returning to England in 1877, he attended the six-month course run by **Thomas Henry Huxley** (1825–1895), who was then Professor of General Natural History at the Royal School of Mines in South Kensington. He had already published a significant number of papers on geology, ornithology and a dozen papers on non-marine Mollusca. From the 1860s Godwin-Austen, like the Blanfords, began to publish mainly on land snails from India and elsewhere and became one of the major figures in Indian malacology (Woodward, 1924). He was not merely interested in shells but wherever possible included detailed drawings of internal anatomy, which enabled him to characterise dozens of undescribed species and relate them to appropriate families. Indeed, the total number of species attributable to Godwin-Austen even exceeds the tally assignable to Benson.

Godwin-Austen embarked on the massive task of working up his molluscan collections, laying the foundations for the numerous publications that were to follow. For many years he travelled into London on a regular basis, working on Mollusca collections at the BM in Bloomsbury, then at the BM(NH) after the collections were transferred to South Kensington. He had been in contact with William Blanford, who was working on the first volume of the *Fauna of British India* series dedicated to terrestrial Mollusca. This covered streptaxid and limacoid groups, the latter representing a major stylommatophoran component of the Indian molluscan fauna. Blanford had been the original editor of the series, but the volume was finally

published in 1908, three years after his death, under the editorship of Charles T. Bingham. In his Preface, Bingham commented that the work was founded on a manuscript by Blanford, who had dealt with conchological aspects, and concluded by Godwin-Austen, who added details of anatomy. This was a fair comment, as Blanford had clearly undertaken most of the work up until his death (Godwin-Austen in Blanford and Godwin-Austen, 1908: xvii). Bingham added that Godwin-Austen's contribution necessitated a considerable amount of further study and dissections, "all of which retarded the publication of the work". This carries a negative tone that seems to have influenced subsequent editors of the series. Bingham died in 1908 and Arthur Shipley, a parasitologist at the University of Cambridge, took over the editorship, assisted by Guy Marshall, Director of the Imperial Bureau of Entomology. Marshall was a practising taxonomist specialising in beetles, particularly weevils. His approach was to provide basic descriptions of large numbers of species, well over 2,000 in some 200 papers. This was a useful but pedestrian undertaking and Godwin-Austen's in-depth studies were a world apart.

Godwin-Austen had progressed with work on the second volume on Mollusca but Shipley and Marshall did not entrust him with leading further contributions. This was apparently motivated by a desire to produce a basic summary of existing knowledge within a short period, rather than embarking on a revisionary study dependent on an elderly individual who might not live long enough to see it through to publication. Instead, it was **Gerard Pierre Laurent Kalshoven Gude** (1858–1924), always abbreviated to G.K. Gude (Fig. 3G), who was given the task. Gude was born in Amsterdam of Huguenot descent but spent some early years in America before returning to Europe and undertaking studies in Germany. He travelled widely in Europe and became proficient in several languages before settling in England in about 1880. He held various jobs at James Veitch & Sons, one of the largest plant nurseries in Europe, and was Private Secretary to Mr (later Sir) Harry J. Veitch, the eminent horticulturalist who was instrumental in establishing the Chelsea Flower Show. Subsequently, he worked on the molluscan collections at the BM(NH), especially its collection of land snails (Woodward, 1925). From the mid-1890s he began to publish papers on Asian taxa (e.g. Gude, 1896a, b, 1897a–f, 1898a–e, 1899a–e, 1901, 1903, 1914b). With access to the BM(NH) collections and the most comprehensive Mollusca library in the world, he was well placed to produce a traditional museum-based synthesis. Gude was working with **Edgar A. Smith** (1847–1916), Assistant Keeper of Zoology at the BM(NH), until Smith's retirement in 1913. As a museum-based scientist publishing on conchology, Smith was likely to have promoted Gude's involvement and supported his methods. In any event, Gude and Godwin-Austen could not work together; their scheduling and approaches were very different and were incompatible. Godwin-Austen (1920: 2) accepted that Gude could work at a faster pace, since the latter's work was based on shell morphology and did not take account of evolutionary relationships or analysis of distributions. Godwin-Austen considered that the pursuit of solely shell-based studies was a retrograde step. In addition, he was not prepared to share access to his hard-won collections during his lifetime when he wanted to use them for his own research.

Gude published the third molluscan volume of *Fauna of British India*, covering caenogastropods and neritimorphs, in 1921. He paid tribute to Godwin-Austen in the introduction and credited him with having described 170 species (also crediting 85 to Benson) and having a knowledge of the subject "equalled by no man living" (Gude, 1921: iii). However, Godwin-Austen was kept in the dark and it seems that his involvement was perceived as being a hindrance to the delivery of Volume 3 on schedule and he was side-lined. Godwin-Austen was clearly hurt by this and highly critical of the content (Godwin-Austen, 1921b). In a scathing review of Gude (1921) in *Nature* he questioned why Gude, with no experience of field work in India, was selected to write the volume and why he "with more than forty years connection with these land operculates, both in the field and in collections, was in complete ignorance that such a work was under compilation" (Godwin-Austen, 1921b). Many of his criticisms were justified. There were inaccuracies, the approach was very limited and some taxa were based on examples that belonged to different species. However, Godwin-Austen's expectation that knowledge of these groups was on the threshold of extensive new advances and that publication was premature did not materialise. Despite its inaccuracies and limited approach, in the absence of an alternative source for the past century, Gude's two volumes remain standard works of reference.

Godwin-Austen did not need the *Fauna of British India* series as an outlet for his research. At this stage in his life Godwin-Austen performed best when working alone and at his own pace. In addition to almost 100 papers on Mollusca, in 1882 he started work on the *Land and Freshwater Mollusca of India, including South Arabia, Baluchistan, Afghanistan, Kashmir, Nepal, Burmah, Pegu, Tenasserim, Malay Peninsula, Ceylon, and other islands of the Indian Ocean*. Between 1889 and 1920 these were published in 13 parts (vol. 1 (parts 1–6), vol. 2 (parts 7–12), vol. 3

(1 part)). He regarded this series as being supplementary to Hanley and Theobald's *Conchologia Indica* and the figures were printed in an identical format. The final contribution consisted of a single part of volume 3 on the glessulids, following on from other stylommatophoran groups that he studied. In addition to describing the shells, whenever he had suitable material, he described key features of the internal anatomy. Concentrating on the reproductive system proximal to the genital orifice, he took every opportunity to describe spermatophores and the penial flagellum, which he recognised as the organ of spermatophore formation and of value in species level discrimination. He also described radula teeth and the distinctive forms of mantle that extended across the shells of such genera as *Macrochlamys* [*Tanychlamys*] and the variation exhibited between different mantle extensions in genera of semi-slugs, impressively summarised in a beautifully coloured plate of species from northeast India (Godwin-Austen, 1914, plate LX). He was actively working on further contributions to *Land and Freshwater Mollusca of India* up until the time of his death. A manuscript on subulinids, including descriptions of new species and genera, was prepared for publication but this, together with the specimens to which it relates, has remained in the NHM archives. Godwin-Austen had also worked up the South Asian Clausiliidae collections, with a drawer of material including new species with manuscript names (Szekeres et al., 2021). The broad geographical coverage that Godwin-Austen sought was not achieved, and most of the material that he studied came from British India, including Burma. However, he also described important collections from elsewhere, including Borneo, the Andaman and Nicobar Islands, and Socotra. Despite the series title, he became so absorbed in the land snails that he did not achieve his ambition of including freshwater species. He was forever mindful of geographical ranges and relationships between the snail faunas of different regions in his attempts to interpret the evolutionary history of different groups and how the fossil record could contribute to such understanding.

He played an active role in a number of London's scientific societies, as well as engaging in an active social life with Jessie, both locally and in London. He was elected a Fellow of the Royal Society in 1880, he was President of the Geography Section of the British Association (1883), President of the Malacological Society of London (1897–1899), President of the Conchological Society of Great Britain and Ireland (1908–1909) and Vice President of the Zoological Society of London (1895). His Presidential address to the Malacological Society in 1899 was a scholarly review of land snail research in British India, including his own contribution (Godwin–Austen, 1899). He did not fail to pay tribute to his predecessors and recognised the pioneering contribution made by Benson. In 1910 he was awarded the Founder's Gold Medal of the Royal Geographical Society. It seems likely that he would have received this prestigious award earlier but this was probably blocked by Clements Markham, President of the RGS between 1893 and 1905, who seems to have taken against Godwin-Austen (Moorehead, 2013: 185).

Godwin-Austen developed a large network of contacts, who would regularly receive his latest papers (Verdcourt, 1995). These included descriptions of many additional species and observations made by other workers including **Dr Ferdinand Stoliczka** (1838–1874), a Moravian geologist who worked with William Blanford for the GSI (Fig. 7). Stoliczka was an outstanding comparative morphologist and a major influence on Godwin-Austen, introducing him to the study of molluscan anatomy as a powerful means of recognising species relationships and limits. Born in Hukvaldy, now in the east of the Czech Republic, Stoliczka gained his doctorate at the University of Vienna where his interest in molluscs was inspired by Moritz Hörnes, Curator of the Imperial Cabinet in Vienna, who worked on the Tertiary Mollusca of the region (Kolmaš, 1982). In 1861 Stoliczka was appointed to the Austrian Geological Survey, in which capacity he attended the British Association for the Advancement of Science at its annual meeting in Cambridge in October 1862. This meeting was notable for the ill-tempered dispute on evolution between Thomas Huxley and **Richard Owen** (1804–1892), superintendent of the Natural History Department of the BM (see Huxley, 1862). Also at the meeting was Thomas Oldham, who promptly recruited Stoliczka to the GSI to lead work on *Palaeontologia Indica*, a series of memoirs established by Oldham devoted to research on the fossils of India. Working under William Blanford, Stoliczka pursued his research with productive dynamism, working up collections of Cretaceous fossils from southern India, he also had a keen interest in natural history including malacology (e.g. Stoliczka, 1871, 1872a, b, 1873; Theobald and Stoliczka, 1872). Much of Stoliczka's southern Indian Cretaceous research was focused on deposits from the shallow seas that had covered extensive areas of peninsular India. Of particular interest to Godwin-Austen were the land snails that were recovered from these marine deposits. These may have been washed out to sea by seasonal floods or by tsunamis resulting from tectonic activity. The land snail fossils range in age from 90–67 Ma (Naggs, 1997) and closely

resemble the modern genus *Corilla* (Godwin-Austen 1899, 1908). Although ancient land connections between southern continents were widely recognised by geologists the processes that separated them were not then understood. The existence of past land-bridges was sometimes invoked to account for these connections, whereas William Blanford held that past continental connections were far more extensive and not simply linked by narrow causeways. For a detailed discussion of the influence of GSI researchers, in particular those of William Blanford, in developing the geological evidence and ideas relating to a southern continent, see Leviton and Aldrich (2004). Stoliczka had employed Indian artists, skilled in Indian miniatures, to paint shells but he died tragically of altitude sickness returning from an expedition across the Himalaya in 1874 before he could make use of them, leaving the way open for Godwin-Austen to publish them himself (Godwin-Austen, 1880a; 1882).

During the compilation of the *Land and freshwater Mollusca of India* Godwin-Austen was able to examine material collected by other workers, such as the important collection made by W.T. Blanford, acquired by the BM(NH) in 1906 and catalogued by Godwin-Austen over a period of five years. In an undated memo bound in to the second volume of his manuscript catalogue he described this collection as "a typical one and of considerable value & interest, for it was brought together and commenced at a period when the study of the Indian land Mollusca was beginning to be made. The greater number of the species recorded were received from the first Collectors, such as Hutton, Benson, Fairbank, Fedden, Theobald &c., together with those collected by William Blanford and his brother Henry Blanford. Types are in some cases distinguished, but in the early days this was not done. I am able to say in numerous instances the specimens representing species are those from which the original descriptions were made." Godwin-Austen also examined material in the Benson collection that was by then subsumed within the McAndrew collection in Cambridge (relevant correspondence is listed by Rookmaaker, 2004). It is clear from a letter that Godwin-Austen wrote to Sidney Harmer, the Director of the UMZC, that he was then in possession of "a complete set of Benson's papers – many with notes made on them in his handwriting, it is a set he gave to Capt. Thomas Hutton who gave it to me about 1864" (see Naggs, 1997: 50 for the full text). He intimated that these papers should eventually go to Cambridge, but this never happened and after Godwin-Austen's death they were presented to the BM(NH) together with his own manuscripts. The Mollusca Section Library in the NHM has heavily annotated copies of his three-volume set of the *Fauna of British India* devoted to Mollusca. Moreover, the library of the Department of Mollusks in the MCZH contains a copy of *Conchologia Indica* heavily annotated by Godwin-Austen (available via Biodiversity Heritage Library: https://doi.org/10.5962/bhl.title.120669), which must have also belonged to him.

Godwin-Austen tried to sell various natural history collections and eventually succeeded in arranging for the BM(NH) to hold his collections for his exclusive use during his lifetime. An agreement was reached for him to be paid for his curatorial work, cataloguing his and other Indian land snail collections such as those of the Blanford brothers and **Richard Henry Beddome** (1830–1911). It was a protracted struggle to obtain the regular payments he was due for this work. To this end he was obliged to correspond regularly with Sidney Harmer, who had moved from Cambridge to become Keeper of Zoology at the BM(NH) from 1909 and Director from 1919. There is extensive additional correspondence relating to Godwin-Austen in the NHM archives (Z_MOLL_MSS_GOD). Parts of the collection were taken back to Nore for him to work on, before being returned to the BM(NH) and the next batch taken and worked up. One justifiable concern he had was that the curatorial work by BM(NH) staff was not carried out to a high standard, particularly with regard to transcribing place names from labels.

The final molluscan volume of *Fauna of British India* was written by **Hugh Berthon Preston** (1871–1945), and was devoted to freshwater molluscs (Preston, 1915). Preston was born in London but spent several years as a tea planter on the Kirklees Estate at Uda Pussellawa in Ceylon, where he was able to amass a large collection of shells, including many that were undescribed. Although he published numerous papers himself (cf. Adam, 1971), much of the descriptive work of his own material was undertaken by **Ernest Ruthven Sykes** (1867–1954). In 1897 Preston returned to London, where he set up business as a shell dealer. He ceased trading in 1915, when his stock was sold. His collection contained many types, which are now dispersed amongst several institutions including the NHM, the Indian Museum (Calcutta), Musée Royale de l'Afrique Centrale (Tervuren), National Museum of Wales, Cardiff and the Michigan Museum of Zoology (Ann Arbor). He also did some useful work as recorder of Mollusca for the *Zoological Record* (1909–1929) before he retired to live on the continent, first in France and then in Italy (Winckworth, 1946).

Both Godwin-Austen and Gude died within a year of each other, bringing the golden age of Indian malacology begun by Benson a century earlier to an abrupt end.

Appreciation of Benson's early work

Each of the aforementioned figures in Indian malacology acknowledged Benson's pioneering role and the difficulties that he faced while still based in India. Godwin-Austen (1920: 32) summed this up rather well: "We are apt to forget how much we owe to Benson and Hutton, the pioneers in Indian Malacology, who, with little assistance and encouragement, did so much. Looking back to the early thirties and the many papers Benson lived to publish, it is noticeable how much his remarks increase the interest in the species he discovered, how much is suggested as to relationship and distribution. The brothers Blanford followed with the same scientific treatment. In comparison the record of to-day, with few exceptions, is bald to a degree, owing to a want of knowledge of the physical features of the country, its size, and varying climatic conditions."

By the mid 1850s Benson had established himself as the principal authority on the land snails of British India. His opinion was sought not only regarding identifications and descriptions but also on topics of broader biogeographical interest. Even **Charles Darwin** (1809–1882), who was interested in the occurrence of identical species that lived at high elevations on distant mountains, sought his advice. On 7th December 1855, Darwin wrote to Benson to enquire if he could provide examples of land snail species that exhibited this pattern of occurrence in India (Darwin, 1855a). Benson (1855b) furnished Darwin with a few examples which, although not specifically mentioned in *On the Origin of Species* (the topic was covered on pages 365–376), were discussed in *Natural Selection*, the longer manuscript of which *Origin* was an abstract. In this Darwin (1975: 555) commented that "land-shells have either been so frequently created, or as I should infer so easily modified, that there do not appear to be many species in common even on mountain-summits as near to each other as the Alps & Pyrenees, or, as I am informed by Mr. Benson, on the Nilghiri & heights of Ceylon."

Darwin also wrote to Edgar Layard in South Africa on 9th December 1855, explaining his interest "in regard to the variation and origin of species" and requesting assistance in obtaining specimens of domesticated birds, especially local breeds of pigeons, ducks and poultry (Darwin, 1855b). In a footnote, Darwin followed up his enquiry to Benson, asking Layard to confirm that the land snails *Cyclophorus stenostoma* and *Pterocyclos bilabiatus* occur in Ceylon, because Benson had answered "somewhat doubtfully on your authority in regard to the above species". Layard responded to these various lines in enquiry and was thanked by Darwin for his "*very* valuable letter."

Chronology of events

The following chronology relating to William Benson and his malacological network has been compiled from Benson's own publications and correspondence, published sources relating to the EIC Civil Service (e.g. Dodwell and Miles, 1839; Doss, 1844; Edmond, 1845), unpublished archives held by various institutions, most notably the British Library's India Office records and the NHM's Library and Archives, and through a systematic search of *The Asiatic Journal and Monthly Register* (later *Monthly Miscellany*) and *The Indian Mail* (later *Allen's Indian Mail and Register of Intelligence*). Other significant events relevant to Benson or South Asian malacology more generally have also been included.

1803 30th March: William Henry Benson born in St Helier, on the island of Jersey.

1814 Foundation of the Asiatic Society Museum in Calcutta, with Nathaniel Wallich as its first Superintendent.

1819 19th July: Benson nominated by the Right Honourable George Canning for admission to East India College at Haileybury, near Hertford. Admitted on 27th July.

1820 26th May: passed examinations "with great credit."

5th December: passed examinations and awarded prize for political economy.

1821 30th April: awarded rank of Writer.

24th May: passed final examinations and awarded gold medal for political economy; leaves East India College ranked fourth amongst first-class students that year.

4th July: Execution of Covenant.

30th October: Benson arrives in Calcutta.

31st October: notification of appointment from the Honorable the Court of Directors of the East India Company.

1822 3rd October: appointed Assistant to Mofussil Special Commission.

1824 Earliest references to Benson's interest in malacology, collecting the holotype specimen of *Unio favidens* from the River Ganges at Bhitoura, between Cawnpore and Allahabad, and specimens of *Helix asperella* in Bundelcund.

1825 Appointed Officiating Register of Banda.

1825 21st October: appointed Officiating Register of the Civil Court and Assistant to the Magistrate of the Northern Division of Bundelcund.

1827 3rd August: Benson marries Maria Scott at Humeerpore.

20th September: appointed Acting Judge and Magistrate of the Southern Division of Bundelcund.

1829 Publishes first scientific articles in *Gleanings in Science*, representing the dawn of the golden age of malacology in India.

21st November: birth of first son, Arthur Edward Benson.

15th December: appointed Deputy Collector of the Southern Division of Bundelcund.

1830 5th October: appointed Acting Judge and Magistrate of the Southern Division of Bundelcund.

1831 8th February: appointed Joint Magistrate and sub-Collector of Etawa.

3rd July: birth of second son, Charles Annesley Benson.

1832 21st January: permitted to proceed to Europe on Furlough [Leave].

25th January: departs Bengal for Europe aboard the *Malcolm*, arriving in Portsmouth with his wife, Maria, and two sons on 29th May.

8th February: Benson's donation of "a series of the land and freshwater shells of the Doab, and of the Gangetic provinces", together with his copy of Lamarck's *Histoire Naturelle des Animaux sans Vertèbres*, registered by the Asiatic Society Museum.

14th June: visits Dublin.

11th July: visits Cornwall.

23rd July: meets George Brettingham Sowerby I in London, with whom he exchanged specimens including a living *Cerithium telescopium* brought from Calcutta.

1833 Summer: last of Benson's population of *Tanychlamys*, captured in India in December 1831 and brought alive to England, dies.

1834 25th August: makes Will just before leaving England.

27th August: the *Malcolm* departs Portsmouth for India.

1835 23rd January: Benson arrives back in India.

18th February: birth of daughter, Sophia Mary Benson, at Bishop's College, Calcutta.

11th April: appointed Civil and Session Judge of the 24-Pergunnahs [24 Parganas, a former district of West Bengal ceded to the EIC in 1757].

8th December: appointed Commissioner of Revenue and Circuit, 4th or Allahabad Division (during Mr Turner's leave of absence).

1836 21st February: Thomas Jerdon arrives in Madras.

24th February: appointed Officiating Civil and Session Judge of Juanpore.

1837 16th January: appointed Magistrate and Collector of Bareilly and officiating as Civil and Session Judge of Juanpore.

13th June: officiating Magistrate and Collector of Dinagepore.

1838 13th March: appointed Officiating Judge of Meerut (during Mr Glyn's absence on leave).

3rd September: appointed Officiating Judge of Delhi.

1839 30th January: appointed Civil and Session Judge of Azimghur and officiating as Civil and Session Judge of Delhi.

5th March: appointed officiating Civil and Session Judge of Moradabad (during absence of Mr Okeden on leave).

11th October: appointed officiating Additional Judge of Rohilcund, stationed at Shahjehanpore.

1840 July–November: Theodore Cantor undertakes zoological survey of the Chinese island of Chusan.

18th November: officiating as Judge of Moradabad, stationed at Shahjehanpore.

1841 Thomas Jerdon collects land snails for Benson in the Nilgiri Hills.

Edward Blyth recruited from Europe to be curator of the Asiatic Society Museum.

11th December: appointed Civil and Session Judge of Moradabad.

1842 Theodore Cantor publishes his general account of the fauna and flora of Chusan.

1843 7th February: appointed Civil and Session Judge of Futtehpore, from which he took a three-month leave of absence to deal with 'private affairs' on July 22nd, extended to November 15th for medical reasons.

1844 2nd August: appointed Civil and Session Judge of Saharunpore.

1845 16th April: takes 6-month leave of absence, presumably due to continuing ill health.

Resident at his estate known as "Rockville", Landour hill station, approximately 30 miles northeast of Saharunpore.

Edgar L. Layard marries and sails to Ceylon.

30th October: granted leave to the Cape of Good Hope.

1846 5th February: departs for the Cape aboard the *Gloriana*, visiting Ceylon en route with his wife and daughter.

Spends the rest of the year in Cape Colony (South Africa) in the hope of recuperating his health. His descriptions of collecting beetles (Benson, 1847) indicate he was there from at least 26th April.

1847 February: returns to India on the steamer *Haddington*, visiting Mauritius en route.

March 10th: William Theobald arrives in India aboard the steamer *Hindostan.*

March 12th: Benson arrives back India; resumes his duties on March 15th.

1st April: permitted to resign the service in India and retire on the Company's Annuity Fund.

Returns to Europe via Ceylon.

1851 4th March: Thomas Oldham arrives in India to head the newly established Geological Survey of India. William Theobald recruited soon afterwards.

1854 Edgar Layard moves to Cape Colony.

1855 William Theobald takes charge of the Pegu Survey and makes collections of land snails in the Tenasserim Valley and elsewhere.

William Thomas Blanford and Henry Francis Blanford join the Geological Survey of India.

5th October: Benson's wife, Maria, dies in Spa, Belgium, aged 47.

5th December: answers a letter from Charles Darwin about the distributional and elevational ranges of land snails in India.

1856 Henry Haversham Godwin-Austen joins the Great Trigonometrical Survey of India to help with the first survey of Kashmir, including the Karakoram.

1857 Benson takes up residence in Cannes, France, during the colder early part of the year.

10th May: beginning of the Indian Rebellion in Meerut.

1858 2nd August: liquidation of the East India Company under the Government of India Act.

16th October: daughter, Sophia Mary Benson, marries Richard Hieram Sankey at Ootacamund.

1859 Richard Sankey serves as executive engineer and Superintendent of the convict gaol at Moulmein, Burma. Collects land snails for his father-in-law.

1860 Godwin-Austen appointed to a permanent post as topographical assistant in the Great Trigonometrical Survey of India.

Theodore Cantor dies at sea.

1862 Ferdinand Stoliczka recruited by Oldham to join the Geological Survey of India.

1863–1868 Henry Blanford appointed Secretary of the Asiatic Society of Bengal.

1865 Publishes last scientific paper.

Lovell Reeve, the author of *Conchologia Iconica*, dies; work continued by G.B. Sowerby II.

1866 14th July: eldest son, Arthur Edward Benson, dies at Aix la Chapelle (now Aachen, Germany).

Transfer of the collections of the Asiatic Society to the Indian Museum.

1867 William Theobald visits England for the first time in 20 years and asks Sylvanus Hanley to co-author a work on the land and freshwater shells of India, which would become *Conchologia Indica*.

1870 27th January: William Henry Benson dies and is buried in Cheltenham cemetery on 2nd February.

July: first part of *Conchologia Indica* published by Hanley and Theobald. Work completed in 1876.

1872 12th June: Thomas Jerdon dies and is buried in West Norwood cemetery, London.

1873 Robert McAndrew's collection, containing most of the 'Benson collection', bequeathed to the UMZC.

1874 19th June: Ferdinand Stoliczka dies of altitude sickness during an expedition across the Himalaya and is buried in Ladakh, northern India.

Henry Blanford appointed Meteorological Reporter to the Government of India.

William Blanford elected Fellow of the Royal Society.

1877 Godwin-Austen retires from the Great Trigonometrical Survey with the rank of Lieutenant Colonel and returns to England.

2nd October: Louis Pfeiffer dies.

1878–1879 William Blanford elected President of the Asiatic Society of Bengal.

1880 Godwin-Austen and Henry Blanford elected Fellows of the Royal Society.

1882 Godwin-Austen publishes the first part of his *Land and Freshwater Mollusca of India*, which was not completed until 1920.

26th October: Benson's daughter, Sophia Mary Sankey, dies.

1883 12th March: Geoffrey Nevill, Assistant Secretary and Librarian at the Indian Museum, retires and returns to Europe.

William Blanford awarded the Wollaston Medal by the Geological Society of London.

1884–1885 Henry Blanford elected President of the Asiatic Society of Bengal.

1885 Geoffrey Nevill dies.

1888–1890 William Blanford serves as President of the Geological Society of London.

1893 23rd January: Henry Blanford dies.

1897–1899 Godwin-Austen becomes President of the Malacological Society of London.

1899 5th April: Sylvanus Hanley dies.

1900 1st January: Edgar Layard dies.

1901 William Blanford awarded the Royal Medal of the Royal Society "for his work in connection with the geographical distribution of animals."

1904 William Blanford made Companion of the Indian Empire.

1905 23rd June: William Blanford dies and is buried in Highgate Cemetery.

1906 28th January: Benson's youngest son, Lieut. Col. Charles Annesley Benson, dies.

1907 T. Nelson Annandale becomes Director of the Indian Museum.

1908 31st March: William Theobald dies.

11th November: Sir Richard Hieram Sankey dies.

Godwin-Austen publishes the first volume on land snails in the *Fauna of British India* series (with William Blanford as posthumous first author).

1908–1909 Godwin-Austen becomes President of the Conchological Society of Great Britain and Ireland.

1910 Godwin-Austen awarded the Founder's Gold Medal of the Royal Geographical Society.

1914 G.K. Gude publishes the second volume on land snails in the *Fauna of British India* series.

1915 H.B. Preston publishes a volume on freshwater molluscs in the *Fauna of British India* series.

1916 Foundation of the Zoological Survey of India (ZSI) with T. Nelson Annandale as its first Director. Zoological collections transferred to the ZSI from the Indian Museum.

1919–1922 G.K. Gude becomes President of the Malacological Society of London.

1921 Gude publishes the third and final volume on land snails in the *Fauna of British India* series.

1923 2nd December: H.H. Godwin-Austen dies.

1924 10th April: T. Nelson Annandale dies.

8th November: G.K. Gude dies, drawing to a close the golden age of Indian malacology.

The Benson shell collection

That Benson made no provision in his 1834 Will for the disposal of his shell collection and scientific papers is hardly surprising, since he was only 31 years old and at the very beginning of his malacological career. What remains a mystery is that he never revised his Will, an inexplicable omission for someone who, by the time of his death in January 1870, was relatively wealthy with property in both England and India. His minimalist Will caused significant problems when it came to dealing with his estate after his death, and that he provided no instructions about what was to become of his molluscan collections and records of his lifelong passion is difficult to understand. Benson's daughter, Sophia Mary Sankey, had visited him in Cheltenham in his final months, but had embarked on her voyage back to India just before he died. His son-in-law, Richard Hieram Sankey, was appointed executor of his estate, and the task of dealing with the many issues arising from Benson's problematic affairs fell to a local solicitor and friend of the Sankey family, Thomas Trewren Vizard, as recorded in the England and Wales National Probate Calendar (Index of Wills and Administrations):

> "Benson, William Henry Esq. Effects under £6000 7th December [1870] Letters of Administration (with the Will annexed) of the Personal estate and effects of William Henry Benson late of Cheltenham in the County of Gloucester Esquire a Widower deceased who died 27 January 1870 at Cheltenham aforesaid were granted at the Principal Registry under the usual Limitations to Thomas Trewren Vizard of Dursley in the County aforesaid Gentleman the lawful Attorney of Sophia Mary Sankey (Wife of Richard Hieram Sankey Esquire) the daughter and one of the Next of Kin and interested in the Residue of the Personal estate and effects of the said Deceased now at Sea on her way to India he the said Thomas Trewren Vizard having been first sworn."

The BM might have been the natural home to such an important collection of specimens but the then Keeper of Zoology, Dr J.E. Gray, was a notoriously difficult man. There had been friction between Benson and Gray about whether *Diplommatina* possessed an operculum, a debate that developed into a somewhat acrimonious saga that emerged in a series of published exchanges during the early 1850s (cf. Naggs, 1997). Benson's view about this issue was eventually shown to be incorrect but whether his animosity to Gray was a deciding factor in the fate of his specimens is unknown. Benson's main collection therefore did not go to the BM but was acquired by **Robert McAndrew** (1802–1873; Fig. 3H), a successful merchant and shipowner who had a strong passion for conchology (MacAndrew, 2002, 2008 – these references also explain that it was Robert's son George who changed the spelling of McAndrew to MacAndrew to remove confusion about its pronunciation for foreign business partners). McAndrew incorporated most of Benson's material into his own huge collection that he bequeathed to the UMZC in 1873. However, from June 1872 until his death, McAndrew's sporadic donations to the BM consisted mainly of Asian and South African non-marine species, in contrast to his previous donations of predominantly marine material from the Red Sea and the Gulf of Suez. Many of these lots represented Benson taxa, and a few are labelled as part of Benson's type series. Shortly before his death, McAndrew prepared a *Catalogue of Shells in the Collection of Robert McAndrew 1870*, which filled four small black volumes (UMZC CAT M2). This provided a comprehensive inventory of species of shells (and a few Crustacea and Annelida) in his collection that were listed alphabetically within genera as then understood. Most of this *Catalogue* had been compiled before McAndrew acquired Benson's collection, and details of specimens added after he had purchased it were subsequently inserted between lines in the relevant place or, more usually, written on the facing right-hand page. This provides a useful way of distinguishing between Benson taxa already present in McAndrew's collection and specimens added after his acquisition of the Benson collection, which usually represent material from Benson's type series. We cannot exclude the possibility that McAndrew received material directly from Benson while he was still alive but there is no evidence to support this.

The bulk of the remainder of Benson's collection was acquired by the BM but, apart from four lots donated by Benson himself, it was obtained indirectly amongst the collections of Hugh Cuming, William Theobald, William and Henry Blanford and H.H. Godwin-Austen (Naggs, 1997). Further material was purchased from the London shell dealers Sowerby and Fulton (see below) in 1912, and about 35 lots of Benson specimens were included in the collection of **John Sydney Hawkins** (1828–1884), which was donated to the BM(NH) by his daughter-in-law and registered in 1954. Hawkins, an engineer who had worked abroad in South Africa, regularly corresponded and exchanged shells with Benson between 1859 and 1864 (see manuscript letters, ZOO_MSS_HAW). He also corresponded with other malacologists, including Frederick Layard (at that time living in Somerset) and four others based in South Africa: **Mrs J.F. Hudson (**of *Helix hudsoniae* fame), **George Wing Browning**

(magistrate of Simonstown, of *Helix browningii* fame), **David Arnot** (an attorney in Colesberg, of *Helix arnotti* fame; note the misspelling of the species named in his honour) and the **Rev**. **John Fry** (of *Pupa fryana* fame). Fry was Acting Curator of the South African Museum for short periods during the absence of Edgar Layard (Barnard, 1965). Both Hawkins and Benson also corresponded with **Thomas B. Bland** (1809–1885), whose malacological interests lay mainly in Caribbean and Central American species. Bland corresponded with Benson in the last few years of his life, mentioning that he had written to him regarding his types of *Pupa regia* in a letter to the French malacologist **Joseph Charles Hippolyte Crosse** (1826–1898) on 12th May 1868 (Breure and Hovestadt, 2019).

Hugh Cuming (1791–1865), who amassed what was probably the largest private collection of Mollusca ever assembled by one person (Dance, 1980), supplied material to Benson for examination and description (e.g. Benson, 1856c: 438; 1856g: 501). He also obtained a significant number of specimens that had been collected by Benson, either directly (see Hutton, 1849: 651) or solicited as part of exchanges with the Asiatic Society Museum (Cumming [sic], 1844: 69). Many of these shells were described by **Lovell Reeve** (1814–1865) in his renowned and beautifully illustrated *Conchologia Iconica* and by **Ludwig Karl Georg Pfeiffer** (1805–1877), more commonly known as Louis, in a series of publications but often without figures. The Cuming collection was purchased by the BM in 1866 and was subsequently transferred with the natural history collections to what is now the Natural History Museum in around 1881. All of the surviving Benson types described from the Cuming collection should therefore be in the NHM, unless there is evidence documenting their dispersal elsewhere.

Heinrich Küster (1807–1876) described and figured species collected by Benson but Küster's types have not been located. In fact, Benson provided much material that formed the basis of descriptions of new taxa written up by other people but none of these species is illustrated here.

The BM did receive a few freshwater snails directly from Benson, as well as specimens collected on Chusan Island, China, by Theodore Cantor and described by Benson (1842b, 1855a), which were presented by the EIC via their India Museum in Leadenhall Street. An arrangement had been introduced whereby the Asiatic Society regularly donated material to the EIC for the India Museum (see below). **George Brettingham Sowerby I** (1788–1854) compiled a manuscript *Catalogue of the Mollusca contained in the Museum of the East India Company* (ZOO_MS_89: 89 f S) that listed all of the EIC's shell collections in the Leadenhall Street Museum (Fig. 8A). Amongst the land snails, these included specimens sent by J.T. Pearson from Darjiling and by Griffith from the "Kassya Hills." However, later lists of shells added after Sowerby's Catalogue include some from Cantor (Fig. 6) and one list of 30 lots from Benson, written in his distinctive handwriting (Fig. 8B). The EIC sent at least part of this collection to the BM (registered as NHMUK 1842.9.30.1–61), although some material collected by Cantor from "Chusan" is in Oxford (OUMNH.ZC.M25555–M25568).

The suggestion by Pilsbry (1908–1910: 52) that species limits of *Glessula* might be understood by an examination of apical shell sculpture was pursued by A.J. Peile, a volunteer at the BM(NH) between 1920 and 1940. As part of this work, all the supposed types of Benson's *Glessula* in the UMZC were loaned to the BM(NH) in 1923 for Peile to examine (Naggs, 1997: 55). These 27 nominal species were subsequently donated in 1946 (and registered on October 16th) but Peile never published any results.

Some Benson material also exists elsewhere, for example in the MCZH (Johnson, 1956, 1959; https://mczbase.mcz.harvard.edu), USNM (Dance, 1986: 205), Manchester Museum (McGhie, 2008). Benson material in the collections of the Asiatic Society of Bengal was acquired by the Indian Museum in Calcutta (Nevill, 1878, 1884), before being transferred to the ZSI in 1916. Some of this material is likely to include specimens from his type series, and a few lectotypes have already been designated on the basis of this assumption (e.g. Annandale, 1924; Johnson, 1956, 1959). The Asiatic Society had established a museum in 1814, initially without a curator, but this situation became untenable and the EIC was eventually persuaded to employ one (Mitra, 1885). In fact, it seems to have employed a whole succession of locally recruited curators before the arrival of its first permanent curator, Edward Blyth, in 1841, and even this was not without its problems (see above). During the 1830s Benson studied the land and freshwater molluscs in the collections of the Asiatic Society Museum, to which he himself had donated material (Anon, 1832). One particularly important collection, which came from the area of "Sylhet, Cherra Poonji and the Khasi Hills on the North-East frontier of Bengal", had been purchased jointly by the Society and Dr J.T. Pearson in 1833 (Pearson, 1833b: 588). Benson had no hand in collecting most of these specimens (*contra* Godwin-Austen, 1920: 32), but the collection contained numerous undescribed species (cf. Pearson, 1833b: 589), of which Benson formally named 31 in his published catalogues (Benson, 1836a, b). A portion of this material, which included several specimens from

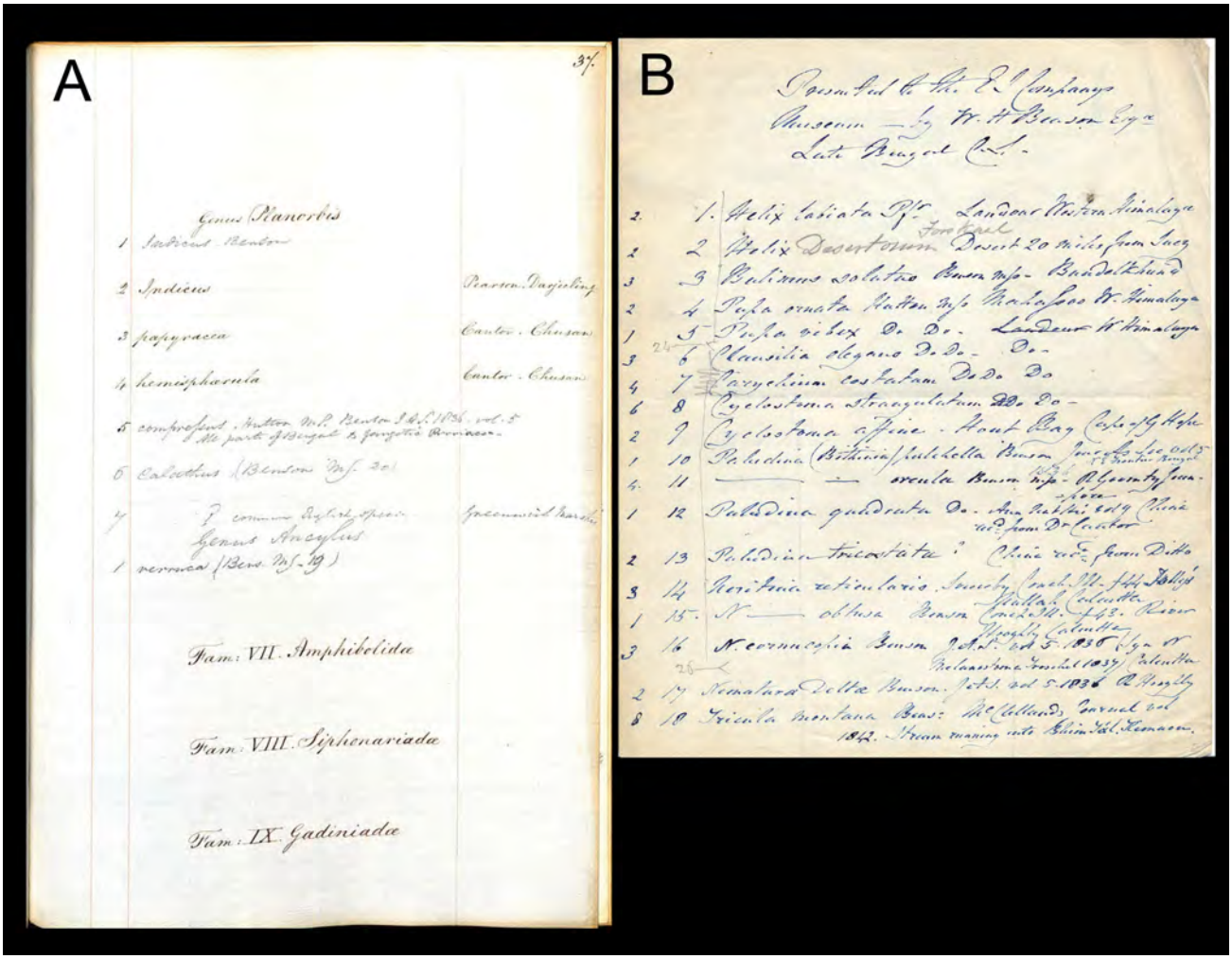


FIGURE 8. A. A page from the Catalogue of the Mollusca present in the EIC's India Museum at Leadenhall Street, London, compiled by G.B. Sowerby I (NHMUK ZOO_MS_89: 89 f S). **B.** The first page from William Benson's list of specimens presented to the India Museum.

Benson's type series, was transferred to the EIC's India Museum in London (not to be confused with the Indian Museum in Calcutta) in 1839 (Pearson, 1840). The shell collections of the Asiatic Society that remained in India suffered serious neglect at the hands of Blyth (Grant et al., 1848), a situation that had not improved by the time that Theobald arranged and catalogued them in 1860, when he noted that dust in some parts of the collection was a quarter of an inch thick. In his Catalogue of the shell collection (Theobald, 1860), only eight of these 14 taxa were mentioned, six were unrepresented and four had documentation showing that they could not be type material, leaving only four with documentation that might allow type recognition (Naggs, 1997: 47). This casts serious doubt on Nevill's (1878, 1885) understandable claim of type status for specimens belonging to these species that were eventually transferred to the ZSI. Surviving manuscripts documenting a donation of specimens made by Benson to the India Museum includes specimens from the "NE Frontier", clearly indicating that Benson had been permitted to retain specimens for his own collection. We therefore consider material representing these taxa in the Benson collection to be part of the type series.

The Indian Museum, which originated from the Museum of the Asiatic Society of Bengal established by Nathaniel Wallich, was offered suitable accommodation by the Government of India on Chowringhee Road (now officially Jawaharlal Nehru Road), close to Park Street and facing the green space of the Maidan across from Fort William, in Calcutta. Following Wallich's resignation, curators were initially paid a salary by the Asiatic Society but, after 1836, this responsibility fell to the Government of India. A temporary grant of 200 EIC Rupees per month (equivalent to £18, 6s, 8d or roughly £2,050 today) was sanctioned for the maintenance of the Museum and

Library, with Dr J.T. Pearson, John McClelland and Edward Blyth appointed curators in quick succession (Anon, 1914). **Geoffrey Nevill** (1842–1885) was the first Assistant Secretary and Librarian in the Indian Museum until his retirement through ill-health in 1883. During his tenure, the shell collections in the Indian Museum received much better treatment; Nevill added new material that he had collected himself, and incorporated material donated by other collectors, such as Edgar and Frederick Layard, Ferdinand Stoliczka and William Theobald. Two parts of a catalogue of the non-marine Mollusca were published (Nevill, 1878, 1885). These are important publications because they are not simple listings of the Museum's holdings but contain new taxonomic arrangements including the erection of several new genera, as well as comments relating to the type status of critical specimens. Apart from the material from the Asiatic Society's collections mentioned above, Nevill (1878) listed only a few specimens that can now be presumed to form Benson's type series (e.g. *Cyclophorus flavilabris* and *Pupina peguensis*). There are, however, many specimens described as "typical", collected from type localities often by the same people who provided specimens to Benson. These include specimens collected at Chusan by Theodore Cantor, which might be verifiable as syntypes. Annandale and Rao (1923: 390) criticized Gude for being unaware that "many Benson types are in the Indian Museum", but they failed to distinguish between material that had been sent to Benson, which would have formed part of his type series, and additional specimens deposited subsequently in Calcutta by various donors, which would not.

T. Nelson Annandale (1876–1924), a Scottish zoologist, travelled to India in 1904 to become Deputy Superintendent of the Indian Museum but in 1907 he became its Director following the resignation of the previous incumbent. During the ensuing decade he succeeded in convincing the Indian Government of the importance of zoology and had the gratification of seeing his department raised to the rank of an Imperial Survey in 1916, with himself as its first Director (Dover, 1924; Kemp, 1925). Annandale worked on a wide range of taxonomic groups that inhabited fresh- and brackish water but had particular interests in malacology, parasitology and freshwater sponges. There was a great deal of concern that soldiers from the Indian Empire returning to India after WW1 campaigns in Africa would bring schistosomiasis with them and that this would lead to this debilitating disease becoming established in India. Annandale carried out extensive research into the possibility of Indian species of freshwater snails acting as intermediate hosts of this disease. This issue stimulated a particular focus on the taxonomy of freshwater gastropods, especially those families that were potential vectors of this and other diseases. In several of these studies Annandale collaborated with **Baini Prashad** (1894–1969), who shared his interest in malacology and ichthyology. Prashad eventually became the third permanent Director of the ZSI and the first Indian to hold the post following the retirement of R.B.S. Sewell in 1934.

Following the foundation of the ZSI in 1916, the zoological reference collections were transferred there from the Indian Museum. The collections have since grown to include material generated by the ZSI's own long-term survey programmes (Ramakrishna et al., 2010) and have been used to generate distributional data from different regions of India. The reliability of such data, however, is uncertain since species identifications have generally not been based on comparisons with type material, most of which is archived in Cambridge (UMZC) and London (NHM) and which is the main rationale for the present study.

The fate of the Benson collection

William Benson's collection of shells has had a chequered history and is beset with problems. We know very little about the handling of the collection or Benson's personal archive of notebooks, manuscripts and illustrations in the months immediately following his death in January 1870. Surviving correspondence between the solicitor Thomas Trewren Vizard and the executor of Benson's estate, Richard Hieram Sankey, reveals that Benson's possessions (including his shell collection, parts of his wife's estate and properties in England and India) were valued in the months following his death so that they could be sold (Gloucestershire Archives D2078/1/1/1). This process took a long time due to complications with the status of Benson's archaic Will, which was not finally settled until February 1871.

The valuation of the shell collection was undertaken by Sylvanus Hanley (Gloucestershire Archives D2078/1/36), who presumably had possession of it from some point in 1870 in order to make his assessment. Hanley probably knew Benson, although no correspondence between the two is known to survive. Hanley had earlier described several bivalve species using specimens from Benson's collection (Hanley, 1856 [in 1842–1856]) and so was already familiar with some of the material. During a visit to England in 1867, William Theobald had proposed the idea of a publication on Indian non-marine molluscs to Hanley (Theobald, 1876: 50), which would eventually become their *Conchologia Indica* (Hanley and Theobald, 1870–1876), and it is also likely that Hanley had corresponded with Benson in the early stages of

this endeavour. Hanley also specifically thanked Richard Sankey in his capacity as executor of Benson's estate in the Preface to *Conchologia Indica*, and it appears that his efforts to value the Benson collection coincided with him using it to produce this work. A later recollection by Theobald (1878: 144) that Hanley had "purchased most of Benson's types" appears to be an error, confusing Hanley's temporary possession of the Benson collection with ownership. The fact that very few Benson taxa are represented in the surviving parts of Hanley's own collection leads us to conclude that he borrowed and returned most of the Benson material that he examined during the writing of *Conchologia Indica*.

The Benson collection was subsequently purchased by Robert McAndrew, although we have not been able to locate any records of precisely when and how this deal was brokered, or how much McAndrew paid for it. McAndrew had begun the process of arranging to bequeath his own enormous collection to Cambridge University in May 1871 (UMZC Archive 2:093), and it was probably with the future of his collection in mind that he prepared his *Catalogue* of specimens in 1870 (UMZC CAT M2). The Benson collection was a late addition to this manuscript, although when these entries were appended is not clear. McAndrew made several donations of Benson type material to the BM in 1872, which might have coincided with him integrating the Benson collection into his own. The McAndrew collection, and with it most of the Benson collection, was finally bequeathed to the UMZC in 1873.

Hanley appears to have retained significant parts of the Benson collection on loan for the purpose of writing *Conchologia Indica* throughout this period. Parcel labels preserved in the UMZC together with Benson collection specimens (Fig. 9) record that he returned at least two packages of "Indian Shells" to Cambridge that were still in his possession after McAndrew's death in May 1873. The fact that some specimens had remained in Hanley's possession might explain why several UMZC lots (e.g. *Hydrocena rawesiana* and *Clausilia ceylanica*) were not labelled

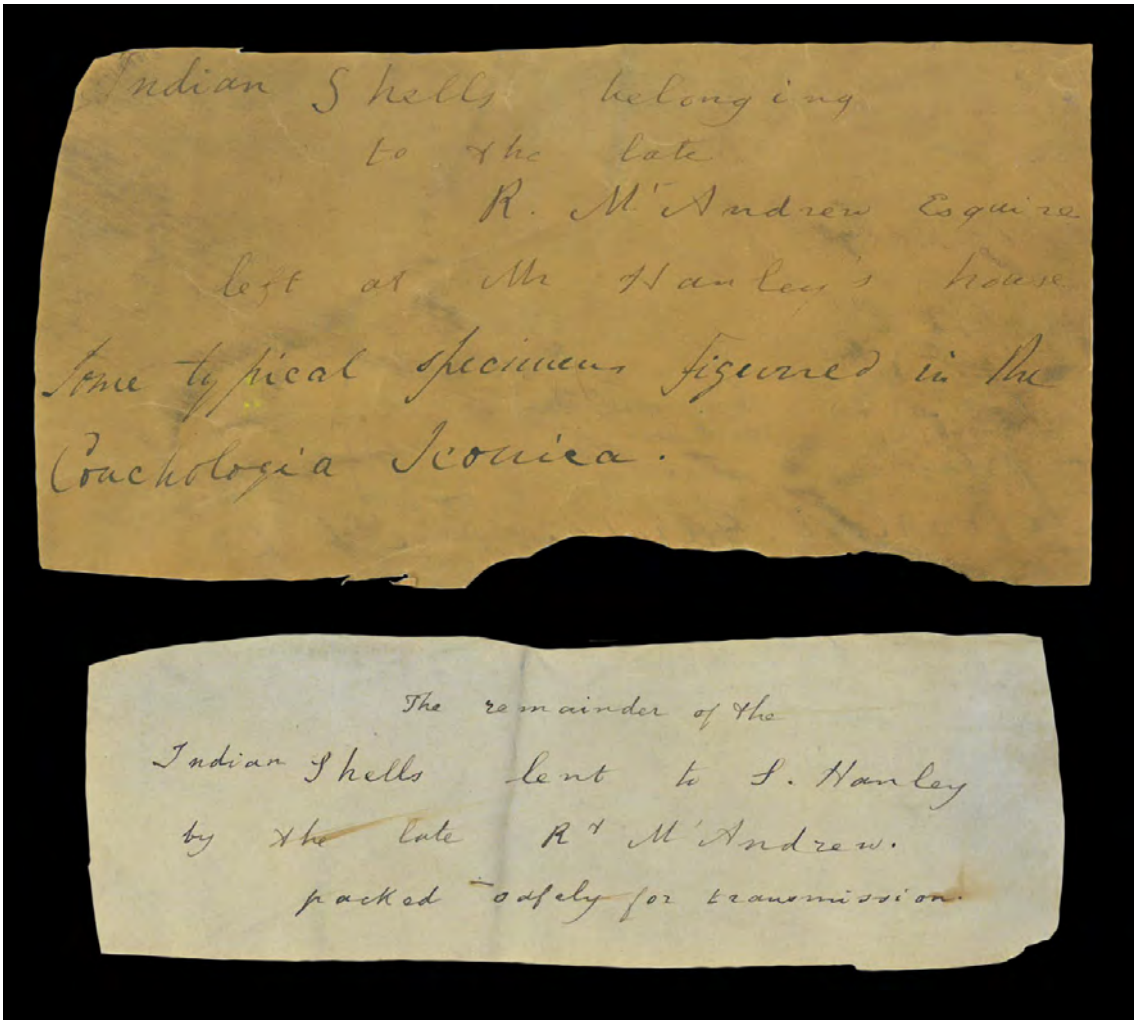


FIGURE 9. Two undated parcel labels, archived in a drawer of Benson specimens in the UMZC, indicating the return to the museum of material that had been loaned to Sylvanus Hanley after the death of Robert McAndrew in 1873.

by McAndrew and retain only Hanley's scant documentation, obscuring their connection to the Benson collection. The same cannot be said for Benson's meticulously compiled notebooks and journals, which were also in Hanley's possession during the writing of *Conchologia Indica*. Benson was a careful and precise natural historian, both as a fieldworker and curator of specimens, and his published papers and surviving correspondence allude to his meticulous methods (e.g Benson, 1851b, letters to J.S. Hawkins ZOO_MSS_HAW). Several footnotes appended to the "Systematic List up to 1874" (Hanley and Theobald, 1870–1876) refer to Benson's unpublished journals and manuscript papers, and also his drawings of species such as *Streptaxis sankeyi* and *Helix seposita*. These now appear to be lost, although it is unclear who was ultimately responsible for this tragedy (Naggs, 1997; Norris and Dance, 2002; Coan and Kabat, 2012). The fortunes of Hanley's own collection have been reviewed in detail elsewhere (cf. Norris and Dance, 2002; Coan and Kabat, 2012). He belonged to a prominent group of 19th century shell collectors and dealers that included Hugh Cuming and Lovell Reeve for whom shells were not primarily considered as biological material of scientific importance. They played a significant role in 19th century conchology because large numbers of specimens passed through their hands. They were particularly interested in novelties and the perceived kudos in possessing new species or in the relatively high commercial value associated with them. They had little or no interest in the fine details of where specimens were collected; more important to them was a tidy arrangement without the encumbrance of what they considered to be superfluous information.

It seems clear that Hanley and McAndrew were primary responsible for the fate of Benson's collection in the immediate aftermath of his death, but one other source of material is worthy of mention. A collection of mainly Indian specimens, some of which have labels in Benson's handwriting, was purchased by the BM in 1871 (NHMUK 1871.9.23.1–232), not long after the final settlement of Benson's Will. This material was acquired from **Robert Damon** (1814–1889), a dealer in natural history specimens based in Weymouth, Dorset, from where he supplied museums throughout the world. This enterprise was later continued by his son, **Robert Ferris Damon** (1845–1929). The date of this particular accession is significant, since it suggests that at least some material from the Benson collection was dispersed through Damon's company, although no documentation to corroborate this has been found. It is also interesting to note that Nevill (1878) listed several specimens in his catalogue of shells in the Indian Museum that were obtained from Damon. What is abundantly clear is that Benson's collection, which he had carefully curated with detailed locality data, suffered badly in the hands of Hanley and McAndrew before it was finally acquired by the UMZC. Godwin-Austen (1881: 291) was the first to record the loss of Benson's original labels: "I regretted to find Benson's original labels, in his unmistakable writing, have been destroyed, and with them his valuable record of exact locality: this fault, however, does not rest, I am glad to say, on the Cambridge Museum." He also later noted: "Benson's collection, after his death, did not receive the care it should have. "India" was substituted for Benson's precise localities; many of the types are not now to be found, and so-called types are not in every case to be depended on" (Blanford and Godwin-Austen, 1908: 54). Although he did not name him in these publications, Godwin-Austen later attributed most of the serious damage to Hanley in a letter to Hugh Fulton (see below), written a few months before he died in 1922: "It was a splendid collection when it first went to Hanley. I remember it well and saw it just as Benson arranged it. He was most particular with locality. Hanley did not believe in geographical distribution and soon removed it [i.e. the locality data]. I could only visit Hanley at times of long interval so he did it all his own way" (Z_MOLL_MSS_GOD; see also Naggs, 1997: 56).

According to Godwin-Austen, Hanley had systematically processed the samples, discarding original labels and degrading the once detailed locality information, which was now often given simply as "India" or "Ceylon". Some labels written by Hanley were added, usually to indicate specimens that had been illustrated in *Conchologia Indica* (e.g. Fig. 78 D). A few of Benson's original labels, written using light blue ink on thin, crumpled paper (e.g. Figs 17 B and 20 E), survived by being inserted into the apertures of the larger gastropods, and some of the larger bivalves also appear to have original data written (possibly by Benson) in pencil on their interior surfaces (e.g. Fig. 108 A). As a result, information of critical importance was lost, which is at odds with Hanley's own assessment in the preface to *Conchologia Indica* that "It is something to have caused the delineation of types before they were lost, forgotten, or destroyed; and the search for actual specimens originally described by Benson, Pfeiffer, Hutton, Blanford &c. has consumed both time and money" (Hanley and Theobald, 1870–1876). In fact, many of the specimens of Benson taxa selected by Hanley for illustration in *Conchologia Indica* were not from the Benson collection but were often from his own collection, which included non-type material provided by Theobald (Theobald, 1876;

Godwin-Austen, 1888 [in 1882–1888]: 235). Although Godwin-Austen apportioned most of the blame for the poor documentation associated with Benson's specimens to Hanley, it is also clear that McAndrew compounded the problem. The Benson collection must have been acquired by McAndrew with at least some of its original documentation intact, otherwise he would not have been able to replace this with his own labels. Since so few of Benson's original labels survive, all other labels that had not been disposed of by Hanley must have been disposed of by McAndrew, presumably including nearly all of Hanley's labels. Exactly what happened seems impossible to resolve.

Further harm to Benson's collection occurred because McAndrew did not store his shell collection in acid-free conditions, which resulted in damage to some shells as a consequence of Bynesian decay (Byne, 1899; Cavallari et al., 2014). This happens when acetic and formic acids, among others, are released by the materials used to store the collection. Problematic storage materials include wood (especially oak), varnishes, resins, poor quality cotton wool, and some types of glass, paper and cardboard. Under high relative humidity and inappropriate temperatures, the acids react with the carbonate of the shells, yielding salts and carbon dioxide. The surfaces of affected shells become covered by a thin white granular layer of efflorescing salts and, in serious cases, they can be completely destroyed. Bynesian decay has affected a few of Benson's specimens, although some of this damage is likely to have occurred before it was acquired by McAndrew.

Another problem stems from McAndrew's method of displaying his shells. McAndrew wished to integrate the Benson collection into his own and to employ his standard method of display, which entailed gluing each of the medium-sized and small specimens in neat rows on distinctive strips of thin blue card. Some shells in Benson's collection are covered by fungus (e.g. Fig. 44 E) that has presumably derived nourishment from the glue used by McAndrew to stick them to his cardboard strips. He re-labelled everything using rectangular labels bordered by carefully ruled double margins (e.g. Fig. 17 G) and in most cases noted that the specimens were ex "Bens. col.". Further work on the Benson/McAndrew collection was undertaken in the 1920s by **Hugh Fulton** (1861–1942), a London shell dealer who had been commissioned by a nephew of Robert McAndrew to clean the specimens and put them into glass-topped boxes, identifying Benson types wherever possible (Naggs, 1997). Many of the specimens illustrated here had to be soaked off McAndrew's blue card using detergent. The glue used was generally water-soluble but not all traces of it could be removed, and remnants are still visible in many of the images of UMZC specimens.

This poor treatment of Benson's collection has historically made the recognition of material from his type series difficult, but we have nevertheless been able to establish the provenance of type specimens for most of Benson's taxa through careful examination of museum registers and archival material. It is clear that a large proportion of his types are present in Benson's own collection and we have also established the type status of specimens elsewhere through critical evaluation of available evidence. An important source of information for supporting type status is conspecific identity with collections made by the original collectors in the type localities, possibly at the same time as the examples that were collected and subsequently described by Benson, even though available evidence does not support their inclusion in the type series. Lectotypes and neotypes have been designated where appropriate but only when certain stringent criteria are met (see below). To remedy the lack of illustrations in Benson's publications, we also provide a comprehensive illustrated catalogue of the taxa described by Benson that we have been able to trace in the UMZC and NHM. Neither of these institutions has complete electronic databases of every specimen in their care, so that it is likely that additional unrecognized Benson syntypes may remain in their general collections despite exhaustive searching during the writing of this monograph. Four standard views (apertural, apical, umbilical and lateral) of each specimen are provided, as appropriate, using modern multilayer imaging. Original, and subsequent, labels have been transcribed and each taxon has been set into a modern systematic framework. Following the end of British colonial rule, the majority of place names in what was British India have been spelt in different ways or have been completely re-named. A list of new and old locality names is therefore provided, together with geo-coordinate data for each of Benson's collecting sites or for localities from which he obtained material (Appendix 2). Several new taxonomic combinations are proposed but this is not intended as a major revisionary work. That will have to await new fieldwork, especially in the Indian subcontinent, and fresh material will need detailed anatomical description combined with molecular phylogenetic study. We hope that the present volume will provide a solid starting point for such revisionary studies. By providing good illustrations of type (or potential type) material this publication is intended to form a sound basis for future taxonomic and faunistic studies in the Indian subcontinent and the other regions from which Benson described material.

Problems of authorship

The correct authorship of numerous taxa attributed to Benson is not always clear. Several names proposed by Benson in manuscript were never formally published by him and are therefore not available names. Occasionally the same names were used in publications by later workers, who thereby validated them and assumed authorship. This applies in particular to taxa described by Reeve and Sowerby, who often referred to a name as "Benson MSS" or "Mus. Bens". Authorship of such species has often been cited subsequently as "Benson in Reeve" or "Benson in Sowerby" but without clear evidence that Benson actually wrote the description, rather than having just suggested the name or provided the specimens, authorship belongs elsewhere. Petit (2007, 2009) discussed this issue, particularly as it relates to taxa covered in Reeve's *Conchologia Iconica*. Specimens of these taxa in the Benson collection constitute all or part of the type series and are therefore mentioned in this volume, but they have not been illustrated.

Conversely, there are instances where Benson used species names that had been suggested to him by others and attributed the authorship to them. For example, the Mauritian endemic *Helix caldwelli* is often attributed to Barclay or to "Barclay in Benson" but authorship should correctly be attributed to Benson alone, since he described the species using the name requested by Sir David Barclay. The same situation arises in the case of *Bulimus benjamiticus* from Jerusalem, which Benson attributed to "Roth MSS", but Benson wrote the description using the specimens and name provided by Roth. Likewise, Benson attributed *Helix tollini* from South Africa to Albers, but Benson provided the description and the name belongs to him.

Descriptions of molluscan taxa from Chusan were included in a general account of the zoology of that island compiled by Theodore Cantor (1842a), in a section on the Mollusca written by Benson (1842b: 486–490). Authorship of these species has consequently often been cited as "Benson in Cantor, 1842" but since the relevant section has its own title and clear attribution to Benson, we have assigned authorship to "Benson, 1842".

Authorship of species is particularly difficult to assign in the paper jointly authored by Benson and Thomas Hutton *On the Land and Fresh-water Shells of the Western Himalaya* (Hutton and Benson, 1838). Although this publication purports to be by both authors, it was clearly written by Hutton, who availed himself of "the valuable assistance of Mr Benson". However, in order "that each may in some measure stand responsible for his contributions", the initial of the respective contributor (H for Hutton, B for Benson) was given at the end of each of the brief species descriptions. Hutton's name appears immediately after the new binomials for 10 of the taxa described, but Benson's initial follows the formal description for 9 of them (Hutton appears to have provided the description for *Helix fastigiata*). Because the authorship of individual sections of the manuscript has been signified in this way, assignment of the designated taxa to Benson alone is accepted.

Finally, it is worth highlighting some of the potential pitfalls that may be encountered when assessing the authorship of historical material such as the Benson collection. Benson published numerous clarifications and additional characters, often long after his original descriptions amongst remarks concerning other species. Assessments based solely on Benson's original descriptions can therefore lead to incorrect conclusions (albeit founded on apparently sound arguments), and a critical part of this research has therefore been to check all of Benson's publications for details pertinent to assigning authorship and identifying type material (see below). For example, the name *Helix rariplicata* was proposed by Benson in 1850 but had first been used in print only a few months earlier by Pfeiffer (1849a). The law of priority would normally require attribution of the species to Pfeiffer, but International Commission of Zoological Nomenclature (ICZN) Article 50.1.1 states: "if it is clear from the contents that some person other than an author of the work is alone responsible both for the name or act and for satisfying the criteria of availability other than actual publication, then that other person is the author of the name or act". This seemed to apply to *Helix rariplicata*, since it appeared that Pfeiffer had simply published the name and a verbatim Latin description from Benson's draft manuscript, which he attributed to "Benson *in litt*." (Pfeiffer, 1849a: 71). However, in a remark published under the description of *Helix munda* (Benson, 1850b), Benson clearly stated that it was he who had reproduced Pfeiffer's description, removing all doubt about authorship.

Evaluation of type material

Evaluating the type status of historical material is problematic and there are varying levels of confidence in recognising members of a type series. Taxonomic and nomenclatural procedures were not formalised until after the establishment of the ICZN in 1895. Data associated with specimens named prior to that date may have been inadequate from the outset or have deteriorated over time. Given the fact that William Benson was a careful worker who meticulously documented his material in accurate detail (see, for example, the surviving labels that accompany

Cyclophorus malayanum, Fig. 17 E), the loss of most of the original information associated with his collection as it changed hands in the mid-19th Century is unfortunate to say the least.

A major problem relates to the fact that, in keeping with common practice of the period, Benson did not designate specimens as types in his publications, although some of his surviving labels identify a few specimens as such. Throughout his career he gave what were generally duplicate samples, many of which would have been shells that formed part of his type series (i.e. syntypes), to various individuals and institutions. Conversely, some lots in the Benson collection include more specimens, or specimens in better condition, than were described in his publications, demonstrating that some of this material was acquired after his original descriptions were written. Apart from the progressive loss of data through the succession of ownership described above, the use of any biological reference collection inescapably introduces errors through the accumulation of mistakes, such as forgetting which boxes specimens came from or simply returning them to the wrong box. It is inevitable that over time some specimens become mixed up and carry incorrect information and it is therefore often difficult, sometimes impossible, to recognize what is type or non-type material.

Notwithstanding these issues, locating, verifying and fixing types is an essential part of any critical study, and we have therefore attempted to locate, fix and illustrate type specimens for all of Benson's species in a consistent and thorough manner. In many cases where type specimens are worn or damaged, we have included figures of additional non-type material in order to illustrate features such as colour, sculpture or missing opercula. Where possible, these non-type specimens were selected from material collected from the type locality, either from the Benson collection itself or from the collections of other naturalists known to have supplied Benson with shells.

As a general principle, specimens of Benson taxa represented in the Robert McAndrew collection in the UMZC are accepted as part of the type series unless there is contradictory evidence, such as non-compliance with the original description, specimen source or type locality. Our rationale for designating neotypes and lectotypes has been to preserve and enhance stability of nomenclature. We feel that this is of critical importance in a scientific study such as this one, which includes many poorly known and often taxonomically complex groups. **All lectotype and neotype designations proposed here should be attributed to Preece and White**. Where possible, holotypes have been identified and illustrated; in some cases, if a holotype is known to have been destroyed or cannot be located, we have designated a neotype. For species where the only available types are syntypes (which is the case for the majority of Benson's species), we have followed ICZN Recommendation 74G: "The designation of lectotypes should be done as part of a revisionary or other taxonomic work to enhance the stability of nomenclature, and not for mere curatorial convenience". We have therefore refrained from designating lectotypes unless there is a clear need to clarify the identity of the species. This has been done through careful comparison of the available syntype material with the original description, and occasionally other relevant literature. Our approach in designating lectotypes has been to select specimens that correspond with the original description; the relevant original description should therefore be consulted for a description of any lectotype designated by us.

In cases where syntype status is uncertain, or where syntypes could not be traced but material corresponding with the original description is available, we have designated a neotype. For material with 'uncertain' provenance, there are three sets of circumstances in which a neotype designation has been deemed necessary: 1) where specimens in the McAndrew collection lacked explicit labelling stating that they originated from the Benson collection, rendering their type status uncertain; 2) where material in the McAndrew collection lacking precise locality information could not be distinguished from specimens in other collections with similarly ambiguous claims to type status; 3) where Benson's type series could not be located but specimens with clear links to the original collector and/or type locality could be identified.

Evaluating syntype status is often difficult in practice, because the available evidence may be conflicting or insufficient. Our approach has been to maintain rigorous standards, but where appropriate to combine this with a measure of pragmatism. The publications from Benson's early malacological career, while he was living in India, include many references to him having collected specimens himself. However, these early descriptions were often less formal and lacked some of the precision of his later work. In late 1835 he examined the collection of non-marine molluscs in the Asiatic Society Museum, describing 27 new species (Benson, 1836a, b). These type series were split, Benson retaining some shells while others remained in the Museum. We have been able to identify syntypes that were subsequently transferred from the Asiatic Society collections to museums in England, but it is likely that additional unidentified type material survives in the ZSI.

Another problem is that Benson acquired additional specimens, sometimes many years after he had originally published a description, that he added to the type series already in his collection. For example, *Helicina andamanica*, which was described from a single shell, is represented by six specimens in the Benson collection. Fortunately, the original description was sufficiently detailed to allow one of these shells to be identified as the holotype, but in similar cases (such as *Cyclophorus cryptomphalus*) the holotype could not be unequivocally identified, and it has been necessary to designate a neotype. Occasionally, Benson's publications shed light on his acquisition of subsequent material, usually in the context of emending or extending his descriptions. Notably, he provided details of a collection of shells from Borneo sent to him by Dr William Traill in a paper published several years after he had originally described most of the species represented (Benson, 1853a). This has allowed the Traill specimens to be identified and separated from Benson's original type material (see, for example, the entries for *Cyclostoma anostoma* and *C. malayanum*). Similar information clarifying the status of potential type material is provided in the remarks under individual species entries.

A critical element of the evaluation process is the comparison of shell measurements with those provided by Benson in his original descriptions. This presents further problems, since Benson used several measurement systems throughout his career, and the dimensions that he intended to convey using terms such as "axis" and "Diam. minor" are sometimes unclear, since they could be applied in different ways depending on the broad morphology of the shell in question. Benson's earliest publications did not include measurements; the first to do so was concerned with freshwater bivalves (Benson, 1835a), although those descriptions, complete with dimensions given in inches, were provided by Isaac Lea. Benson himself first provided measurements as part of his *Descriptive Catalogue* of material in the collection of the Asiatic Society (Benson 1836a, b), choosing to use the Latin measurement "Poll." [1 pollex = 12 lines, an English line being equivalent to 2.11 mm], which he continued to include in his publications until 1846 (Appendix 1). Following his retirement to Europe in 1848, after which most of his work was published in the *Annals and Magazine of Natural History*, he provided virtually all of his measurements in millimetres. In order to establish a consistent approach, we clarified Benson's intended measurements by comparing his published dimensions with unique specimens (i.e. holotypes with distinctive features or characteristics mentioned in their original descriptions, such as damage). From these comparisons, it appears that Benson's "Axis" refers to the height of the shell from the apex to the umbilicus when applied to lenticular forms such as *Helix ochthoplax*, but includes the peristome for turbinate or turriform shells such as *Cyclostoma anostoma*. He also seems to have been inconsistent when measuring "Diam. major", sometimes excluding the peristome but usually including it. However, in most cases we have been able to discern Benson's intended measurements and match these to specimens with only very small margins of error.

For a few species, Benson occasionally named varieties that differed from the typical form. We follow the ICZN in treating such varietal names as being available at the species level and, for nomenclatural purposes, these are initially treated as subspecies. Some of these have subsequently been recognised as full species, such as *Helix* (*Plectopylis*) *refuga* var. *dextrorsa*, now *Chersaecia dextrorsa* (Benson, 1860). Others are not currently recognised as biological species or as subspecies, but the names remain available. Many specimens from the Benson collection have been identified on labels written by Robert McAndrew and others as unnamed varieties, usually with "var" appended to Benson's species name. There is a single example of an original label in Benson's handwriting recognizing a variety ("*Cyclostoma Malayanus* var. Bens."). However, this specimen would only be excluded from the type series if Benson had attributed varietal status prior to publication. Varietal status on labels, whether attributed by Benson after publication or subsequently by other workers, has no nomenclatural standing. In most cases it is unknown if the assessment of "variety" status was made by Benson on labels now lost, or whether this was an independent assessment made subsequently by others. We take the position that in all such cases the attribution of varietal status is likely to be secondary and thus do not exclude specimens from the Benson collection labelled as "var." from the type series.

After his return to Europe in 1847, Benson described new taxa from material in his own collection and also based on specimens sent to him by colleagues still actively collecting on the Indian subcontinent and elsewhere. In the absence of much of the correspondence that undoubtedly accompanied these specimens, it is sometimes not clear whether he returned some or kept them all as part of his own collection. However, evidence gleaned from surviving archival material has provided some insight into the movement of shells around his malacological network, summarized below. In most instances it is clear that he kept all of the shells (and in some cases spirit specimens) that were sent to him for description and

that these formed his type series within his own collection. Other specimens, probably collected at the same time as those provided to Benson, appear to have been retained by the original collectors (most notably Edgar Layard and William Theobald) and survive in their collections. In most cases these are not considered part of the type series since they were not amongst those examined by Benson and he did not explicitly refer to them. However, we have included details of some of this non-type material under individual entries, especially in cases where locality data associated with Benson's own specimens has been lost or degraded. Our reasons for doing so are clearly described in the remarks accompanying the species entry, and for some species we have deemed it appropriate to designate such specimens as neotypes. There are also instances in which it is clear that Benson based his description on examination of specimens in the collections of other naturalists. For example, in 1856 he inspected Edgar Layard's collection (Benson, 1856d: 94), describing several species represented in it as new, so that specimens in both the Benson and Layard collections potentially form part of these type series if they were published in or after 1856.

Occasionally, there is sufficient evidence to identify type specimens that were returned to the original finder. For example, the distinctive holotype of *Helix ochthoplax* was clearly returned to William Theobald by Benson after he had examined it (see notes on Theobald's collection, below, for a full discussion). The single shell in Theobald's collection, purchased by the BM(NH) in 1888, closely matches the type description (including distinctive damage to the body whorl), and no specimens could be found in the Benson collection. Negative evidence such as this has also been informative in the case of the four species named by Benson using material provided by Thomas Oldham (see below).

For specimens from other collections, careful scrutiny of the circumstances in which they were collected and provided to Benson is essential in the evaluation of their type status. The following collections were the sources of some of the specimens used by Benson in his species descriptions. Details of the histories of these collections, together with our evaluation of the type status of specimens of Benson taxa contained therein, are provided. As discussed above, some of these specimens now form part of the Benson collection in the UMZC, whereas others were returned. However, while hopefully providing a significant and helpful advance on this subject, we make no claim to having produced the final word on these matters.

William Theobald collection

William Theobald's collection of primarily Southeast Asian non-marine molluscs was acquired by the BM(NH) in 1888, comprising some 2100 lots (NHMUK 1888.12.4.1–2114) amongst which are numerous examples of species described by Benson. Theobald was the most prolific source of material on which Benson based his species descriptions, providing type specimens for 96 species listed in this catalogue. The material that remained in Theobald's own collection is therefore important, in some cases critically so, given the degradation of the documentation accompanying Benson's shells. Reminiscing on the production of *Conchologia Indica*, written with Sylvanus Hanley, Theobald later wrote that he retained Hanley's services as a co-author by allowing him to keep the shells he sent for illustration "save for unique specimens" (i.e. holotypes; Theobald, 1876a: 50). We have therefore assumed, although we cannot know for certain, that Theobald similarly allowed Benson to keep many of the shells that he sent for description on the same basis. This hypothesis is supported by the fact that several Benson species based on holotype specimens provided by Theobald are not represented in the Benson collection, but shells precisely matching the original descriptions are often present in Theobald's collection (a notable example being *Helix ochthoplax*). Parts of Theobald's collection are known to be in other museums, notably a donation of 168 specimens to BMAG in 1868 and material given to Miss Juliana Emma Linter, now in her collection held by the RAMM, Exeter. Documentation associated with the Theobald collection is generally good, and most of the specimens are clearly labelled as coming from the precise type localities quoted by Benson. The Theobald material is therefore crucial in establishing the identity of some of Benson's species, especially in instances where the material in the Benson collection now lacks adequate documentation, particularly with regard to locality. We illustrate numerous Theobald collection shells, including identifiable type material and some non-type specimens, which in several instances have been designated as neotypes.

Edgar Leopold Layard collection

We list 39 species described by Benson for which the type specimens were provided by Edgar Layard. Benson devoted two papers to Layard's Sri Lankan discoveries (Benson, 1853c, 1856c), and his material from South Africa is the main subject of two others (Benson, 1856d, 1864b). Layard himself intended to compile a list of the Sri Lankan land and freshwater Mollusca in the manner of his *Notes on the Ornithology of Ceylon* series (Layard, 1853a: 98),

although this was apparently never published. He did, however, describe the circumstances of the discovery of many of these species several years before Benson formally described them, and he included Benson's manuscript names and various notes by Benson in his *Rambles in Ceylon* series (Layard, 1852, 1853b–d).

Edgar Layard built up a considerable private collection of land snails that was split into several parts, both during his lifetime and after his death. He recorded the dispersal of some of his specimens in his own publications, describing Hugh Cuming being allowed to rifle through his collection in search of rarities (Layard, 1895: 72); we were able to identify several ex-Layard specimens amongst the Cuming collection now in the NHM, including the Benson taxa *Streptaxis layardiana* and *S. cingalensis*, the type series of which were supplied to Benson by Layard. Other specimens were personally donated to the BM, his name appearing in the registers on several occasions between 1849 and 1853; Sri Lankan material presented in 1850 by Henry L. Layard (a cousin) includes specimens accompanied by labels attributing the shells to Edgar. In 1912, the BM(NH) purchased some 375 lots from the shell dealers Sowerby and Fulton (NHMUK 1912.8.16.1–375), which included numerous Benson taxa from Sri Lanka and South Africa. Some of these lots (e.g. *Pupa muscerda*, *P. mimula*) were accompanied by labels that Gude (1914a: 292–293) identified as examples of Edgar Layard's handwriting. Many other specimens from this 1912 acquisition possess labels in the same hand and it is almost certain that a significant part of it was from Layard's collection, although this provenance is not recorded in the BM(NH) register or the contemporary Sowerby and Fulton sale catalogues. However, there is a striking congruence between the species represented in this collection and those described using Layard's material by Benson (20 of the 39 species supplied to him, together with the type specimen of an unpublished manuscript name) and later by Melvill and Ponsonby (1892; 1893a, b; 1894, and 1897, adding a further 22 non-Benson entries). The label accompanying *Vitrina layardi* (a Benson manuscript name) states "*Taken by myself at Pallabadula at the foot of Adams Peak and described by Benson from the left hand & middle examples. Right hand one from* [illegible]".

Another part of Edgar Layard's collection was purchased by **Bernard Richard Lucas** (1864–1941), an expert on salt, who worked for the Brunner Mond Company that was later merged into Imperial Chemical Industries (ICI). He had broad interests in natural history and was a member of both the Conchological Society (of which he was a vice president) and the Malacological Society of London. He travelled widely and for much of his working life was based in Cheshire and had close links with Manchester Museum, where some of his collection was eventually deposited. He retired to Darlington where his remaining collections of various natural history specimens were divided (Jackson, 1942). His collection of shells, including Layard material, was formerly in Darlington Museum before being transferred to the BM(NH) in 1986. In most cases these specimens are not considered to form part of Benson's type series, since it can be shown that Layard had given the type specimens to Benson at the time of their description. However, they retain importance because in some cases they were collected from the type locality, possibly at the same time as the specimens that were sent to Benson.

Frederick Layard collection

We list 19 species described by Benson using specimens supplied by Frederick Layard, most of which were published in two papers (Benson, 1856d, 1860b). Layard made a large donation of specimens to the BM in 1849 (NHMUK 1849.12.29.11–360, "Presented by Fred^{k} Layard Esq., Ceylon"), although these specimens apparently pre-date Layard's acquaintance with Benson and most are only tentatively identified to genus level in the registers. Most of the type material provided by Frederick Layard survives in the Robert McAndrew collection in the UMZC. Later donations to the BM were made while Layard was living in Malvern, Worcesterhire, including specimens of *Helix hyptiocyclos*. Layard spent several years of his later life in the west of England, from where he corresponded regularly with J. Sydney Hawkins. The pair also exchanged specimens, and a few additional lots attributed to Layard have been identified amongst the J.S. Hawkins collection and material donated to the BM(NH) by the ZSI; the type status of these specimens is discussed in the remarks under the relevant species.

W.T and H.F Blanford collections

William Blanford provided Benson with material for 21 species descriptions. His collection was acquired by the BM(NH) in 1906 and registered in five dedicated series of registration numbers separate from the main Mollusca section register (NHMUK 1906.1.1.1–2316, NHMUK 1906.2.2.1–395, NHMUK 1906.3.3.1–91, NHMUK 1906.4.4.1–192, NHMUK 1906.5.5.1–89). The registration numbers therefore follow the standard NHM format (year.month.day.lot/specimen) but do not represent genuine dates. Because of this, the registration numbers were frequently transcribed onto specimen labels with the specimen number first (e.g. 109.06.4.4), which can be a source of confusion.

Bound in to the second W.T. Blanford register volume is a memo written by Godwin-Austen, which notes that type material is likely to be represented in the collection (see above). Benson is specifically mentioned as the source of several specimens. Henry Blanford provided Benson with specimens on which he based a further five species. Henry Blanford's collection was acquired by the BM(NH) some years later than that of his brother, but the specimens were not assigned individual registration numbers, the whole collection being listed under the accession number 1944. The Henry Blanford collection included specimens mounted on glass slips, also a characteristic of William Blanford's collection, but very few specimens can be shown to have any direct connection with Benson.

Thomas Hutton collection

Captain Thomas Hutton presented part of his personal shell collection, comprising some 83 lots, to the BM in 1856 (NHMUK 1856.9.15.1–83, "Presented by Capt. T. Hutton, Mussoorie"). This donation included the type series of many of the species named by Hutton, together with lots representing 12 species named by Benson. The latter group consists mainly of species published in their jointly authored paper (Hutton and Benson, 1838). We include specimens from both the Hutton and Benson collections in the type series of these taxa.

Theodore Cantor collection

Benson described 35 species using material provided by Theodore Cantor, most of which are associated with two important collections made in Chusan and the Malay peninsula. All of the molluscs described by Benson from Chusan were collected by Cantor during the four-month period that he spent on the island in 1840. Some of this named material was retained by Benson and is now in the UMZC. Other specimens were sent by Cantor in 1842 to the EIC's India Museum at Leadenhall Street, London (see above, Fig. 6) and were subsequently transferred to the BM (NHMUK 1842.9.30.1–61). Another subset of specimens was donated by Cantor to the short-lived Museum of the Zoological Society of London (ZSL), and his accompanying list of species was published in a note about this material (Cantor, 1843). The ZSL collections were dispersed after its closure in 1855 (Wheeler, 1997), and many of the specimens were sold to the BM, although the Chusan shells do not appear in the registers of ZSL material. Other parts of the ZSL collections were acquired by provincial museums in Britain and Ireland. Cantor specimens from Chusan were acquired by the OUMNH (registered as OUMNH.ZC.MO25555–MO25568), although whether these were originally part of the ZSL collection is not known. Because Cantor spent several months in Calcutta in 1842, we presume that Benson was able to examine all of his material before it was dispersed, and so we include shells from several collections in the type series. Some species described by Benson in 1842 are not represented in any of these collections. Part of Cantor's private collection, comprising herbarium sheets, birds and miscellaneous natural history specimens, was sold by Stevens' auction house in 1868, but whether any shells were included was not recorded (Chalmers-Hunt, 1976: 106). Benson (1851e: 187) mentioned the second collection "of Penang and Malay species, of which Dr. Cantor entrusted the publication to me, together with some interesting drawings of the inhabiting mollusks, which, I hope, will now shortly see the light". He described several new species based on this material in various papers published over the next decade, including *Cyclophorus cantori*, *C. malayanus*, *Stenothyra cingulata* and *Helix cantoriana*.

Thomas Oldham collection

Oldham is recorded as the source of specimens used by Benson to describe four Burmese species, one of which (*Plectotropis oldhami*) was named in his honour. The BM(NH) acquired Oldham's shell collection in 1951 (accession number 1733), together with his manuscript specimen lists and catalogues (Z_MOLL_MSS_OLDT). Only one of the four Benson taxa, *Hydrocena frustrillum*, is listed in Oldham's manuscript catalogue, suggesting that Oldham's specimens representing the other three had been retained by Benson.

John Sydney Hawkins collection

Benson and Hawkins were regular correspondents and frequently exchanged shells, particularly specimens from South Africa. Benson based his descriptions of three South African species on material collected by Hawkins. Numerous specimens in the Hawkins collection (NHMUK 1954.6.2.1–1579) are labelled as being presented to him by Benson during the period 1859–63 (note: in most cases the dates given on the associated labels refer to the year Benson donated the specimens to Hawkins, not the publication of the species). Other specimens were given to Hawkins by naturalists who had worked with Benson, notably Frederick Layard, David Arnot, Robert Gordon and William Theobald. These shells are not part of Benson's type series, however, and care must be taken to establish the source of specimens of Benson taxa in the Hawkins collection. The accompanying archive of

correspondence and specimen lists (ZOO_MSS_HAW) provides critical details of the circumstances of Hawkins' acquisitions. At some point during their acquisition by the BM(NH), many lots of Benson species in the Hawkins collection were labelled as "paratypes", although this designation is incorrect because Benson never formally designated holotypes. Nevertheless, those that are demonstrably from Benson's collection are syntypes, and several retain original labels in Benson's handwriting or can be matched to manuscript lists sent to Hawkins by Benson. Some specimens, however, are labelled with significant discrepancies (such as incorrect locality data or collection dates after the original description had been published) that preclude their recognition as part of the type series.

Asiatic Society Museum/India Museum/Zoological Survey of India collections

Evaluation of potential type specimens contained in the collections of the Museum of the Asiatic Society of Bengal, the EIC's India Museum in London and the Indian Museum (later ZSI) in Calcutta is complicated by the interwoven early histories of these institutions. Benson based his descriptions of 32 species on a collection of specimens purchased jointly by the Asiatic Society and Dr J.T. Pearson in 1833 and kept in the Society's Museum in Calcutta. Some of this material remained in the Asiatic Society collections and was subsequently absorbed into the Indian Museum (see Theobald, 1860; Nevill, 1878, 1884), although many Benson taxa were missing from these published lists (cf. Naggs, 1997). A more detailed picture of the handling of Benson's type series emerges from careful examination of archival sources, which reveal that some were donated by the Asiatic Society to the EIC's India Museum in London as part of an agreement established in 1839 by Dr J.T. Pearson and Dr Thomas Horsfield, the respective curators of these institutions (see correspondence, Zoology_Manuscripts _MSS_IND). Beginning in 1839, Horsfield made a series of donations of molluscan specimens to the BM, the most important of which occurred in 1841, when some 38 lots of shells corresponding with a list of "Sylhet" specimens published by Pearson (1840) were registered (NHMUK 1841.7.23.1–38). There is no record of any agreement that allowed Benson to retain any of the material he had examined, although such arrangements were commonplace. However, Benson did not visit the "N.E. Frontier" region from which the Asiatic Society specimens were originally collected, so it is likely that specimens in Benson's own collection were acquired from the original source. A surviving manuscript list of specimens donated to the India Museum compiled by Benson himself (Fig. 8B), although undated, must have been compiled after his retirement in 1847 because he refers to himself as "late Bengal C.S.". This list includes specimens from "the N.E. Frontier", and it is difficult to see where he might have obtained these specimens if not from the Asiatic Society. The *Catalogue of the Mollusca contained in the Museum of the East India Company* compiled by G.B. Sowerby I must also have been written after this date, since it includes details of Benson's donation.

Other significant transfers occurred throughout the 1860s and 1870s until the closure of the India Museum, one of which (NHMUK 1879.12.26.1–229) contained specimens that correspond with those provided to Benson by Robert Trotter. It has been possible to identify some of Benson's type specimens amongst this material, most of which are from the "Sylhet collection" described by Benson in 1836. Considerable confusion has arisen due to the similarity of the names of the India Museum and the Indian Museum, compounded by the fact that in some cases both of these institutions have held parts of Benson's type series. There are also numerous examples of specimens stated incorrectly to be Benson "types", such as amongst the material transferred from the Indian Museum to the BM(NH) in August 1924. We have evaluated and attempted to clarify the status of material from these institutions in the remarks for relevant species entries. We have also been able to identify with confidence some type material that remained in India, such as *Pupina peguensis* Benson 1860 (cf. Tripathy and Sajan, 2019), although full evaluation of material now in the ZSI collections remains to be undertaken.

Geographical coverage

As a result of Benson's extensive network of contacts, the geographical coverage of his malacological activities was broad, if distinctly clustered (Figs 10–14). He described new species from 18 countries or island groups, mostly centred on the Indian subcontinent (Table 3). Many of the collecting localities are in places where ships from Britain stopped en route to India before the opening of the Suez Canal in 1869. This explains material described from the Cape Verde Islands, St Helena and the Cape of Good Hope, also known as the Cape Colony, where ships would have berthed before sailing east into the Indian Ocean. Not all passages to India took this lengthy route via the Atlantic, but the alternative involved sailing to Alexandria, on Egypt's Mediterranean coast, and then travelling overland by train and then camel to Suez on the Red Sea for onward travel by ship (Beames, 1961). It seems that the latter route offered fewer opportunities for discovering undescribed species, perhaps not surprisingly given the generally arid character of the region.

South Africa was also visited by people from the Indian subcontinent who wanted some relief from the oppressive climate of that region or who needed to leave for health reasons, as was the case with Benson. Robert Trotter also spent time in South Africa, as did Edgar Layard, who moved there for work. Mauritius and Ceylon, from where Benson obtained much material, were regular ports of call on the voyages between India and the Cape during which Benson collected several undescribed species of pelagic gastropod.

TABLE 3. Geographical breakdown of the type localities for taxa described by W.H. Benson, using modern political boundaries. Totals include all available names, including subspecies, replacement names and *nomina dubia*. The affinity of *Spiraxis cingalensis* is unknown but it is here included within the pulmonates. Appendix 2 provides a detailed breakdown.

Country / Region	GASTROPODA				BIVALVIA	Total
	Neritimorpha	Caenogastropoda	Pulmonates	Non-pulmonate heterobranchs		
India	5	69	122	-	23	**219**
Burma (Myanmar)	4	26	47	-	3	**80**
Sri Lanka (Ceylon)	-	12	34	-	-	**46**
South Africa	1	2	25	-	-	**28**
Zhoushan ('Chusan'), China	-	7	9	1	8	**25**
Andaman Islands	2	3	12	-	-	**17**
Australia	-	4	5	-	-	**9**
Mauritius	-	1	8	-	-	**9**
Indian Ocean	-	3	-	2	-	**5**
Mainland China	-	-	5	-	-	**5**
Malaysia	-	4	2	-	-	**6**
St Helena	-	-	5	-	-	**5**
Borneo	-	3	1	-	-	**4**
Cape Verde Islands	-	-	3	-	-	**3**
Pakistan	-	-	3	-	-	**3**
Nepal	-	-	2	-	-	**2**
Atlantic Ocean	-	-	-	1	-	**1**
France	-	-	1	-	-	**1**
Israel	-	-	1	-	-	**1**
Liberia	-	-	1	-	-	**1**
Singapore	-	-	1	-	-	**1**
Total	**12**	**134**	**287**	**4**	**34**	**471**

The greatest density of collecting localities came from India (Figs 11 and 12), Ceylon (Fig. 13) and Burma (Fig. 14). It is extraordinary to see the wide coverage achieved at such an early date, often involving extremely remote or mountainous localities (Fig. 12) that are not easy to access even today. Beyond British India, many of the collecting sites in Southeast Asia were similarly stop-over locations en route to China and elsewhere. This applies in particular to Cantor's collecting activities associated with his zoological survey of the Chinese island of Chusan during the First Opium War.

A comprehensive list of localities from which Benson obtained material is given in Appendix 2. This geographical gazetteer gives both the current and colonial names, the modern country and the geo-referenced coordinates for each of the collecting localities mentioned by Benson. The occurrence of Benson species is listed by country or island in Appendix 3.

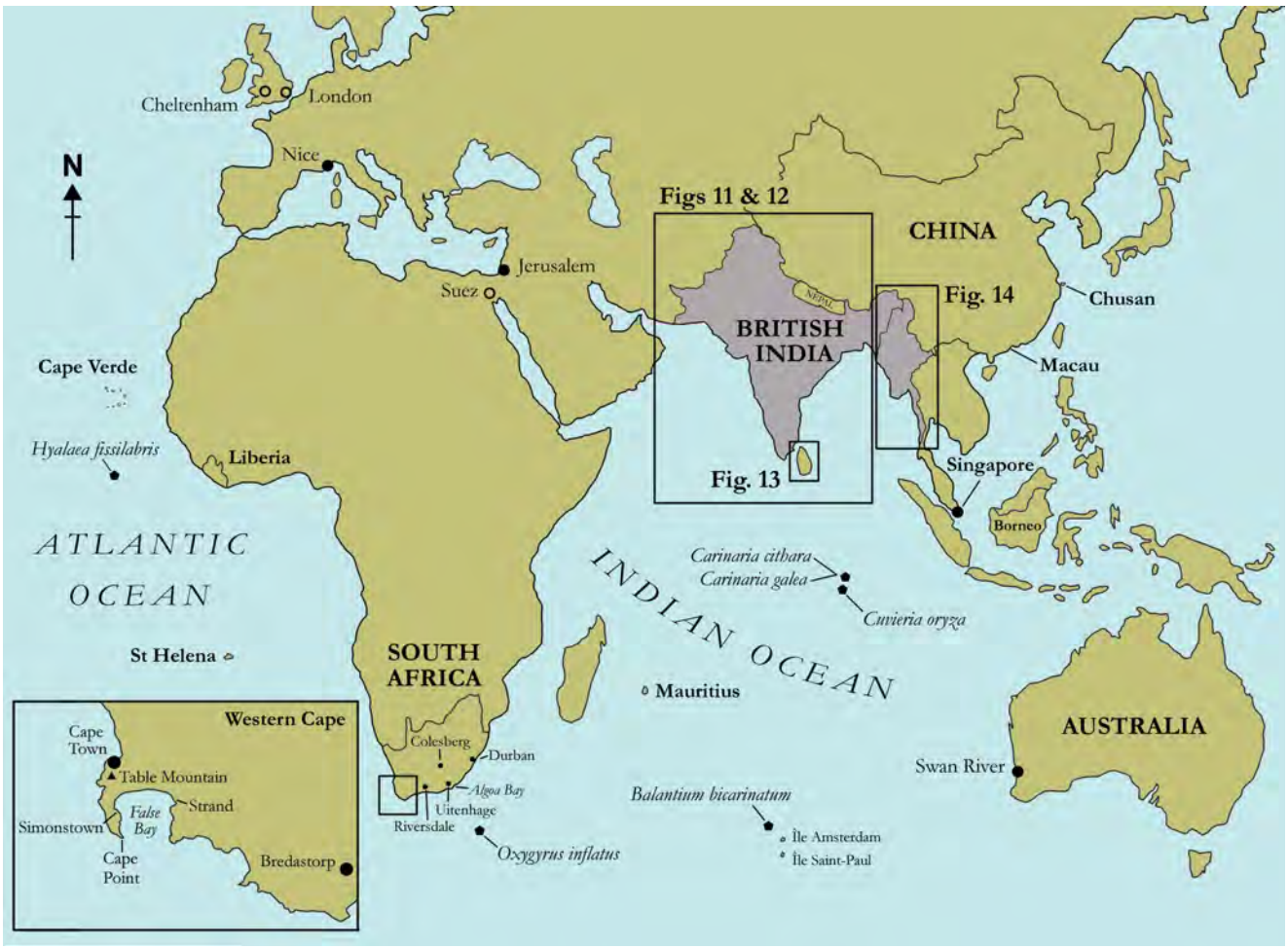


FIGURE 10. World map showing type localities for species described by William Benson. The location of planktonic marine species collected on voyages to and from India are shown, together with other significant localities mentioned in the text (open circles). Detailed maps showing type localities of species collected in British India, Ceylon and Burma are provided in Figures 11–14, with localities around Cape Town, South Africa shown as an inset.



FIGURE 11. Map of British India based on mid-19th century cartography showing jurisdictions that existed during Benson's time in India.

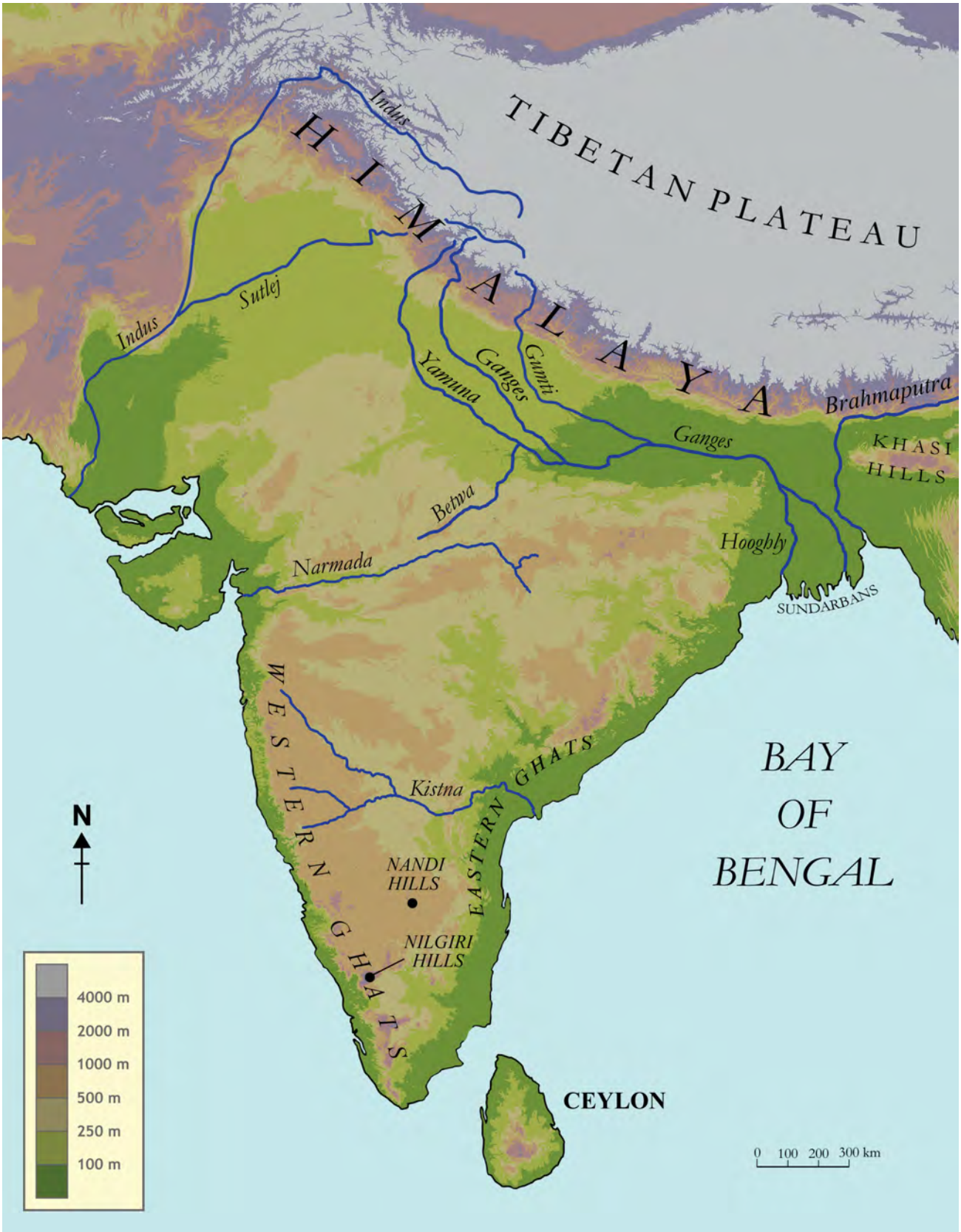


FIGURE 12. Relief map of the Indian subcontinent showing major rivers and other features relevant to Benson's type localities, based on an 1857 map of India and neighbouring countries. Rivers are labelled using historical spellings.



FIGURE 13. Map of Ceylon showing type localities of species named by Benson.



FIGURE 14. Map of Burma based on late 19th century cartography with jurisdictions that existed during Benson's career, showing type localities of species named by Benson.

CATALOGUE

The process of locating each Benson taxon began with systematic scanning of *Index Animalium*, covering the period 1801–1850 (Sherborn, 1922–1932), and the index of molluscan species introduced from 1850 to 1870 compiled by Ruhoff (1980), for the terms "Benson" or "Bens". This provided a solid foundation from which to work, although we have found one taxon, *Modiola variegata*, named by Benson with an extremely brief description, which had been overlooked in these meticulously compiled source publications. Since the ICZN does not quantify description, it is normally accepted that any description is sufficient to make a name available. Several other taxa described by Benson have also been overlooked by these source publications, but most of these are the names of forms or varieties, some of which were introduced incidentally, almost in passing (e.g. Benson, 1859e). We here treat these as subspecies. Details of material described by Benson, mostly in the collections of the UMZC and the NHM, are listed below in systematic order. The baseline scanning allowed the preparation of a detailed list of target taxa, enabling a focused search for those Benson taxa in the general collections of both institutions that had not already been isolated as potential types and archived separately in the respective type collections.

Throughout his career, Benson sent shells to a wide range of people and institutions. These are likely to have included specimens that formed part of the type series of many of his taxa. We have traced a great deal of this material, but our coverage is almost certainly not comprehensive. Other specimens examined or collected by Benson were present in the collections of the Asiatic Society of Bengal, which were first acquired by the Indian Museum in Calcutta and subsequently transferred to the ZSI in 1916. This material was catalogued before its transfer by Nevill (1878 and 1885) and we mention relevant specimens recorded by Nevill and where possible include ZSI registration numbers and images.

Benson's species were published prior to the development of an understanding of the evolutionary concept of biological species and the notion of barriers to gene flow between species. These concepts developed in the early 20th century and reconciled Darwinian evolution and Mendelian and population genetics into what was known as the modern synthesis. Species had long been understood in terms of immutable morphological forms and recognised by unique features or the notion of morphological gaps between species- one species did not grade into another. However, in practice and until recently, the methods for recognising the majority of described species, were largely unaffected by theoretical concepts involving biological species. In Benson's time recognition of snail species was based almost exclusively on their shells and often on the basis of very few examples or just one specimen; most often little or no information on inter and intra specific variation or on differences between adults and juveniles was available. Indeed, some new species continue to be described on a similar basis. In keeping with the majority of described snail species, determining the validity of Benson's available names as biological species has hardly begun. We have not attempted to review the biological status of Benson's species but uncritically follow existing synonyms in recognising species. Thus, in providing 'current' generic combinations of senior subjective synonyms under Benson's name in the systematic treatment, we use the expression 'provisionally recognised as'. In doing so we are neither endorsing nor questioning identity with the senior subjective synonyms. In fact, despite the limitations of the material that they worked with, the skills of early 19th century malacologists in delimiting species achieved remarkably good results in providing a foundation for recording snail species diversity. With the study of internal organs, notably the reproductive organs proximal to the genital orifice, it became possible to recognise more and more groups of related species at a range of hierarchical levels above species level and also to discover features that supported species distinctions or allowed the discovery of distinct species with similar shell forms. The advent of molecular biology has provided extremely powerful tools that have provided a new age for systematics, independent of the constraints of morphological research. Nevertheless, and certainly for the immediate future, molecular systematics remains dependent on the existing foundations of morphology-based systematics and the type concept in providing stability for naming and communicating about species. Thus, Benson's work has a critically important role to play in providing a foundation for the identification of fresh material for the future development of snail taxonomy and systematics.

Regardless of their status as senior names, or as biological species, all available names proposed by Benson are listed first (in bold) in the systematic treatment, followed immediately by the accepted current combination. "Not located" refers to those instances where no authentic Benson type specimens could be traced. The original name and citation are given for each species, followed by a brief synonymy together with details of its type locality (or localities, for cases where the type series was obtained from more than one site), museum labels, registration numbers

and any relevant remarks. For family level attributions and above we have essentially followed Bouchet et al. (2017) for gastropods and Bouchet and Rocroi (2010) and Bieler et al. (2010) for bivalves. Departures from these schemes are explained in the Taxonomic Notes. The synonymies are not comprehensive but, where appropriate, always include the names used in the three volumes of *The Fauna of British India* series on land molluscs (Blanford and Godwin-Austen, 1908; Gude, 1914a, 1921), and the one devoted to freshwater gastropods and bivalves (Preston, 1915). Dates of publication for articles in the *Proceedings of the Zoological Society of London* and the *Annals and Magazine of Natural History* have been checked using Duncan (1937) and Evenhuis (2003) respectively, and publication dates of parts of *Conchologia Iconica* and *Conchologia Indica* were checked using Petit (2007, 2009) and Prashad (1927) respectively. Dates of publication for articles in the *Transactions of the Entomological Society of London* have been checked using Wheeler (1912). Nomenclatural and taxonomic updates are taken from various publications dealing with particular regions including India (Subba Rao, 1989; Ramakrishna et al., 2010; Mitra et al., 2005; Ramakrishna and Dey, 2007; Raheem et al., 2014; Tripathy and Mukhopadhayay, 2015), Andaman and Nicobar Islands (Rao and Mitra, 1991; Rao et al., 2013), Sri Lanka (Starmühlner, 1974; Naggs and Raheem, 2000), Bhutan (Gittenberger et al., 2017a, b, 2019b, 2020, 2021); Mascarene Islands (Germain, 1921; Griffiths et al., 2006), West Malaysia (Maassen, 2001), Australia (Smith, 1992; Stanisic et al., 2010, 2018) and South Africa (Connolly, 1912, 1939; Herbert and Kilburn, 2004). Various websites providing authoritative taxonomic information were also consulted, such as MolluscaBase, the World Register of Marine Species (WoRMS) and the MUSSEL project website (http://www.mussel-project.net).

Particular attention has been paid to the condition and number of specimens mentioned in the original publications, whether they possessed opercula, and to the people who provided Benson with the material, as these help to evaluate the type status of particular specimens. Such issues, together with other relevant information, are discussed under "Remarks". Benson rarely designated individual specimens as "types" and it has been appropriate to designate a lectotype, particularly where the type series contains a mixture of species (e.g. *Clausilia aculus*). Illustrations are provided for each species that we have been able to trace (Figs. 15 to 114). As a general rule, we have transcribed *verbatim* all of the data on the labels accompanying the specimens listed below. Where relevant, we have also included data from museum registers and archival sources such as notebooks and correspondence.

Phylum MOLLUSCA

Class GASTROPODA

Subclass NERITIMORPHA

Order CYCLONERITIDA

Superfamily HELICINOIDEA

Family HELICINIDAE

Subfamily HELICININAE

Genus *Pleuropoma* Möllendorff, 1893

Pleuropoma andamanica (Benson, 1860)

Helicina andamanica Benson, 1860c: 194; Pfeiffer, 1865: 244; Hanley and Theobald, 1870 [in 1870–1876]: 3, Pl. 6, Fig. 10; Nevill, 1878: 325

Helicina (*Aphanoconia*) *andamanica* Benson; Gude, 1921: 366

Pleuropoma andamanica (Benson); Ramakrishna et al., 2010: 16; Rao et al., 2013: 125

Type material UMZC I.103350.A, **Fig. 15 A** (holotype from the R. McAndrew collection labelled "*Helicina Andemanica* Bens., Bens. col., Andeman Ids")

Original measurements: "Diam. major 9, minor 7½, axis 5 mill."

Other material UMZC I.103350.B–F (five shells from the same lot as the holotype)

Type locality Andaman Islands: "Habitat in insulis Andamanicis" [lives on the Andaman Islands]

Remarks Benson based his original description, which included the operculum, on one shell: "The single specimen received from Mr. Theobald is considerably weathered; and it is possible, from certain appearances, that the spiral rugae may be less prominent in a perfect specimen, and that they have become more developed by the decay of the surface. In this specimen the coloured band is to be discovered only on close inspection, and a very minute portion remains of the shining decussated surface". Only the largest (diameter 9 mm) of the six specimens in the UMZC conforms to Benson's description and published measurements, and we therefore recognize it as the holotype. The other specimens are smaller and less weathered and were presumably acquired later. This is the type species of *Andamanica* A.J. Wagner, 1905, although this name was introduced as a "Formenkreis" by Wagner (1905: 406) and whether it should be afforded genus-group taxonomic rank is debatable (see Gittenberger, 2015; ICZN, 2018). *Pleuropoma andamanica* is endemic to the Andaman Islands (Rao et al., 2013).

Pleuropoma scrupula (Benson, 1863)[1]

Helicina scrupulum Benson, 1863c: 425; Pfeiffer, 1865: 239; Hanley and Theobald, 1875 [in 1870–1876]: 53, Pl. 133, Figs 8, 9; Nevill, 1878: 325; Gude, 1921: 370
Pleuropoma scrupula (Benson); Ramakrishna et al., 2010: 18
Aphanoconia scrupula (Benson); Rao et al., 2013: 126
Type material NHMUK 1888.12.4.97, **Fig. 15 B** (holotype, complete with operculum, from the W. Theobald collection labelled "*Helicina scrupulum* Benson (Type), Andamans")
Original measurements: "Diam. 5, alt. 3 mill."
Type locality Andaman Islands: "Habitat in insulis Andamanicis" [lives on the Andaman Islands]
Remarks Benson based his original description, which included the operculum, on a single shell "in good order" provided by William Theobald. *Pleuropoma scrupula* is endemic to the Andaman Islands (Rao et al., 2013).

Superfamily HYDROCENOIDEA

Family HYDROCENIDAE

Genus *Hydrocena* Küster, 1844

Hydrocena noticola Benson, 1856

Hydrocena noticola Benson, 1856c: 439; Pfeiffer, 1858: 158; Connolly, 1939: 597
Type material not located
Original measurements: "Long. 2, diam. 1¼ mill."
Other material NHMUK 1937.12.30.5007–5017, **Fig. 16 A** (one of 11 specimens from the Connolly collection labelled "*Hydrocena noticola* Bs., Simonstown, 1909")
Type locality South Africa: "*Hab.* cum praecedente" [lives with the preceding species [*Cyclophorus convexiusculus* var. *minor*]; "Mr. Layard discovered it in damp mould, amongst a pile of loose rocks, in a steep ravine, on the side of Table Mountain overlooking Camp's Bay ..."]
Remarks The number of specimens provided by Edgar Layard was not noted in Benson's original description, which included the operculum. No specimens from the type series could be located. This species has a wide geographical and altitudinal range in the Cape Peninsula, and it has also been recorded from Malawi. It is common in a range of vegetation types, particularly Afromontane *Podocarpus* forests, where it lives in leaf-litter and under logs (Herbert and Kilburn, 2004).

Genus *Georissa* W.T. Blanford, 1864

Georissa frustrillum (Benson, 1860)

Hydrocena frustrillum Benson, 1860c: 193; Theobald, 1857: 248
Georissa frustrillum (Benson); Pfeiffer, 1865: 251; Blanford, 1869a: 172
Hydrocaena frustillum [sic] Benson; Hanley and Theobald, 1874 [in 1870–1876]: 48, Pl. 117, Fig. 5
Hydrocena (*Georissa*) *frustrillum* Benson; Nevill, 1878: 336; Preston, 1915: 4 (as *frustillum*)
Type material UMZC I.105205.A, **Fig. 16 B** (one of two syntypes from the R. McAndrew collection, associated with a label in Benson's handwriting that reads "124. *Hydrocena frustrillum* B, Myaleit Hill, nr Ava")
Original measurements: "Long. 2½, diam. 1¾ mill."
Type locality Burma: "Habitat in Regno Ava. Teste Prof. Oldham" [lives in the Ava region according to Prof. Oldham]
Remarks Benson based his original description on more than one specimen: "The specimens received [from Thomas Oldham] were in a dead state". These shells, none of which had opercula, had been alluded to in an earlier paper (Benson, 1856e: 233): "I have received, among some shells collected in the Burmese territory by Mr Oldham, a third species of *Hydrocena*, intermediate between *H. sarrita* and *H. Illex*, but larger than either. It was found at the Myaleit Hill, near Ava". According to Benson (1860c), this species futher differs from *Georissa illex* "in the absence of the very elongate slender spire of that species, in the want of an umbilicus, and in the form of the aperture, which presents internally an angle at the junction of the columellar lip". However, comparison of type specimens of these taxa shows them to be rather similar. *Georissa frustrillum* was listed in an unpublished "Catalogue list of shells (Operculata)", compiled by Oldham in 1876, which accompanied part of his collection acquired by the BM in 1951 (Accession Number 1733), but these specimens could not be traced.

Georissa illex (Benson, 1856)

Hydrocena illex Benson 1856e: 231; Theobald, 1857: 248; Pfeiffer, 1858: 161
Hydrocaena illex Benson; Hanley and Theobald, 1874 [in 1870–1876]: 48, Pl. 117, Fig. 4
Hydrocena (*Georissa*) *illex* Benson; Preston, 1915: 2
Georissa illex (Benson); Ramakrishna et al., 2010: 16
Type material UMZC I.105210, **Fig. 16 C** (syntype complete with operculum from the R. McAndrew collection, glued to a strip of paper and associated with a label in Benson's handwriting that reads "*Hydrocena Illex*, *Pyxis*, *Frutillum*, 19")

Original measurements: "Long. 2⅔, diam. 1⅔ mill."
Other material UMZC I.102990 (single shell from the R. McAndrew collection labelled by Hanley "*Hydrocaena illex* Benson, figured in Con. Indica pl. 117, f. 4", no locality or collection data); NHMUK 1888.12.4.293–297 (five shells from the W. Theobald collection labelled "*Georissa illex*, Tenasserim")
Type locality Burma: "Hab. ad Phie Than vallis Tenasserim, satis frequens, saxis calcareis adhaerens" [lives at Phie Than in the Tenasserim Valley, quite common, adhering to calcareous rocks]

Remarks The number of specimens provided by William Theobald was not noted in Benson's original description, which included the operculum. Theobald (1857: 246) later recorded that the species was commonly found "On the bare face of limestone rocks". UMZC I.102990 is not labelled as coming from the Benson collection and, although this is likely, it has been excluded from the type series on the basis of the lack of documentary evidence.

Georissa pyxis (Benson, 1856)

Hydrocena pyxis Benson, 1856e: 232; Theobald, 1857: 248; Pfeiffer, 1858: 161
Georissa pyxis (Benson); Blanford, 1864: 463; 1869a: 172; Ramakrishna et al., 2010: 16
Hydrocaena pyxis Benson; Hanley and Theobald, 1874 [in 1870–1876]: 48, Pl. 117, Fig. 3
Hydrocena (*Georissa*) *pyxis* Benson; Nevill, 1878: 336; Preston, 1915: 3
Type material not located
Original measurements: "Long 1½, Diam. 1¼ mill."
Other material UMZC I.105280.A, **Fig. 16 D** (specimen with operculum from the R. McAndrew collection, formerly glued to a label in Benson's handwriting (**Fig. 16 E**) reading "23, Pyxis", no locality data); UMZC I.105280.B (single shell without operculum from the same lot); UMZC I.103030.A–C (three shells from the R. McAndrew collection labelled "*Hydrocaena Pyxis* Bens? Bens. col., Cherapoonjee"); NHMUK 1888.12.4.298–301, **Fig. 16 F** (one of four shells from the W. Theobald collection labelled "*Georissa pyxis*, Thaiet-mio")
Type locality Burma: "Hab. ad Thyet-Mio" [lives at Thyet-Mio]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. None of these specimens retained an operculum because Benson was unable to describe it. Theobald (1857: 248) later reported that the species was common and found under stones. The two shells in lot UMZC I.105280 were attached to an original Benson label, but we only consider one of them (UMZC 105280.A) to be a syntype, since the other possesses an operculum. This specimen is smaller than the dimensions provided by Benson, however, and appears to be a juvenile. The other Benson collection specimens (UMZC I.103030.A–C) are from India. Four shells in the William Theobald collection labelled as *pyxis* (NHMUK 1888.12.4.298–301) were collected at the type locality but have no clear link to Benson and are not conspecific with the UMZC shells. According to Ramakrishna et al. (2010) this species also occurs on the Andaman Islands. This is the type species of *Georissa* W.T. Blanford, 1864 by original designation.

Georissa rawesiana (Benson, 1860)

Hydrocena rawesiana Benson, 1860c: 193
Georissa rawesiana (Benson); Pfeiffer, 1865: 252; Theobald and Stolicka, 1872: 332
Hydrocaena rawesiana Benson; Hanley and Theobald, 1874 [in 1870–1876]: 48, Pl. 117, Fig. 6
Hydrocena (*Georissa*) *rawesiana* Benson; Nevill, 1878: 337; Preston, 1915: 4
Type material not located
Original measurements: "Long. 2; diam. 1½ mill."
Other material UMZC I.103105, **Fig. 16 G** (single shell labelled by Sylvanus Hanley as "*Hydrobia rawesiana* Benson, figured in Conch. Indica", no locality data)
Type locality Burma: "prope Moulmein, ad cavernas "Farm Caves" dictas" [lives near Moulmein in the caverns known as "Farm Caves"]
Remarks Benson based his original description on a single shell, lacking its operculum, found inside "a decayed specimen of *Sophina* taken by Major R.H. Sankey in the rainy season of 1859". UMZC I.103105 closely matches Benson's original dimensions but is not labelled as coming from the Benson collection and is also not listed in McAndrew's manuscript Catalogue. The provenance of the shell is therefore unclear, although the Benson collection is the most likely source. It is possible that the specimen was one of the shells returned to the UMZC by Hanley after McAndrew's death, hence its absence from his Catalogue. Theobald and Stoliczka (1872) mentioned the holotype, and also reported numerous examples found on two limestone hills in the valley of the Ataran River, providing additional characters enabling separation from similar species.

Georissa sarrita (Benson, 1851)

Cyclostoma sarritum Benson, 1851e: 188
Hydrocena sarrita (Benson); Pfeiffer, 1858: 161
Georissa sarrita (Benson); Pfeiffer, 1865: 252; Blanford, 1869a: 172, Pl. xvi, Fig. 1

Hydrocaena saritta (Benson); Hanley and Theobald, 1874 [in 1870–1876]: 48, Pl. 117, Fig. 2
Hydrocena (*Georissa*) *saritta* (Benson); Nevill, 1878: 336; Preston, 1915: 2
Type material UMZC I.103725.A, **Fig. 16 H** (one of two syntypes from the R. McAndrew collection labelled "*Hydrocena Sarrita* Bens., Bens. col., China" [see comments below]); UMZC I.105215 (syntype from the R. McAndrew collection labelled "*Georissa sarrita*? Type, Bens. col." A second circular label (possibly in Benson's writing) reads "2.22.2 Cherra")
Original measurements: "Long. 2, diam. 1¼ mill."
Type locality India: "Hab. in muscis arborum vallis profundae, prope Cherra Poonjee, in montibus Garo dictis, praeter fines Orientales Provinciae Bengaliae" [lives in tree moss in the deep valleys near Cherra Poonjee in the mountains known as Garo [Garo Hills], on the border of the province of Eastern Bengal]
Remarks The number of specimens examined was not noted in Benson's original description, which did not mention the operculum. He provided additional details of the locality in his remarks: "I got specimens of this species with other minute land shells as yet undescribed [*Acmella tersa* (Benson, 1853) and *Angustopila milium* (Benson 1853)], in long tree moss, in which specimens of jasper, from the deep valley of Musmai, below Cherra Poonjee, had been packed on the spot" (Benson, 1851: 189). It seems that McAndrew mis-transcribed Benson's original label (now lost), mistaking "Cherra" (the type locality of *saritta*) for "China". We therefore accept the two shells in lot UMZC I.103725 as part of the type series. We also accept UMZC I.105215 as a syntype, despite the question mark added after the species name on McAndrew's label. The Benson collection shells are rather worn.

Superfamily NERITOIDEA

Family NERITIDAE

Subfamily NERITINAE

Genus *Vittina* H.B. Baker, 1923

***Neritina tigrina* Benson, 1836**

Accepted as *Vittina smithii* (Wood, 1828); *Neritina smithii* Wood, 1828: 26, Pl. 8, Fig. 11

Neritina tigrina Benson, 1836b: 749
Type material not located
Original measurements: "1.35 inches in length"
Other material NHMUK 20190425/1, **Fig. 15 F** (one of four specimens from the H. Cuming collection associated with a label, possibly in Pfeiffer's handwriting, stating "*Neritina Smithii* Gray (*N. tigrina* Benson), Calcutta)
Type locality India: "adhering to the piles which defend Fort William from the action of the Húglí" and "in the aqueduct that supplies the old Course at Calcutta"
Remarks This species was included amongst Benson's descriptions of material in the Asiatic Society Museum but was not part of the "Sylhet" collection. He mentioned specimens "of an ordinary size" in the museum collection and also at least two others, one large specimen that he had collected alive at Fort William and another from Calcutta. This species is listed in McAndrew's manuscript *Catalogue* but no specimens from the Benson collection could be found in the UMZC. A specimen from the Asiatic Society Museum was included in a transfer of material to the EIC's India Museum in 1841 (Pearson, 1840: 729), but this shell could not be located. The four specimens from the Cuming collection are associated with a label that might be in Louis Pfeiffer's hand, but the circumstances of their acquisition by Cuming are unknown. *Neritina tigrina* is a synonym of *N. smithii* Wood, 1828 (Tryon, 1888b: 37; Eichhorst, 2016b: 1105). In addition to its occurrence in the Gangetic estuary, *Vittina smithii* has been reported from the Irrawaddy Estuary in Burma (Subba Rao 1989), and from Mauritius (specimens in the Museum of Zoology, University of Navarra), but the latter most probably represent an introduction. It probably also occurs in the estuaries in Bangladesh.

Genus *Neripteron* Lesson, 1831

***Neripteron cornucopia* (Benson, 1836)**

Neritina cornucopia Benson 1836b: 748
Neritina (*Dostia*) *cornucopia* Benson; Blanford, 1868: 60, pl. I [XII], figs 23–25
Dostia cornucopia (Benson); Annandale and Prashad, 1919: 242, Pl. XX, Fig. 2a
Neripteron cornucopia (Benson); Eichhorst, 2016a: 359
Type material UMZC I.105195, **Fig. 15 C** (syntype from the R. McAndrew collection, with a label in Benson's handwriting (**Fig. 15 D**) stating "Calcutta, *N. cornucopia*" and a second label in another hand giving "Quilon" as the locality); NHMUK 1954.6.2.772 (syntype complete with operculum from the J.S. Hawkins collection labelled "*Neritina cornucopia* Bens 1836 = *melanostoma* Troschel, Calcutta, W.H. Benson Esq." A scrap of blue paper has the number 26, in Benson's handwriting)
Original measurements: "Greatest transverse breadth 0.7 inch."
Other material NHMUK 20200355 (single shell from the W.T. / H.F. Blanford collection, figured in Blanford 1868, Pl. XII, figs 23–25)

Type locality India: "in the Húghlí at Fort William, and in Tolly's Nullah, adhering to piles and bricks."
Remarks This species was included in Benson's *Descriptive Catalogue* of material in the Museum of the Asiatic Society, but no specimens were present in that collection. The original description, which included the operculum, was based on two specimens collected by Benson, one of which he retained (UMZC I.105195) and the other he gave to J.S. Hawkins in 1862 (NHMUK 1954.6.2.772). The small label bearing the number 26 that accompanies the latter corresponds with a manuscript list supplied to Hawkins by Benson, which includes "26 *Neritina cornucopia* Bens (*Melanostoma*), Calcutta" (ZOO_MSS_HAW). Brandt (1974: 16) and Dey (2016) listed *Neritina cornucopia* as a junior synonym of *Neritina* (*Dostia*) *violacea* (Gmelin, 1790) but Qin (1997) upheld their specific distinctness on the basis of differences in shell pigmentation patterns, ventral shell characters and radular teeth characteristics. Moreover, allozymic and karyotypic distinctions were also found between the two taxa. *Nerita indica* Souleyet, 1842, *Neritina aciculata* Reeve, 1855 and *Neritina melanostoma* Troschel, 1837 are synonyms (Eichhorst, 2016a). In the delta of the Ganges *N. cornucopia* occurs at the edge of creeks of fresh (or almost fresh) water near the upper limts of tidal influence (Annandale and Prashad, 1919: 242).

Neritina depressa Benson 1836

Accepted as *Neripteron violaceum* (Gmelin, 1791);
Nerita violacea Gmelin, 1791, 13: 3686, no 68

Neritina depressa Benson 1836b: 748; Reeve, 1855 [in 1855–1856], 9 (*Neritina*): pl. 18, species 86
Dostia depressa (Benson); Annandale and Prashad, 1919: 243, Pl. XX, Fig. 2b
Type material: NHMUK 1841.7.23.27, **Fig. 15 E** (syntype presented by Dr T. Horsfield labelled "*Neritina depressa* Benson, Himalaya" with an accompanying register entry that states: "*Neritina depressa* n. 33", here designated as the lectotype)
Original measurements: "Greatest transverse diameter 0.8 inch."
Other material UMZC I.105190 (eight shells from the R. McAndrew collection labelled "*Neritina Depressa* Benson, Calcutta", no collection data)
Type locality India: "probably from the *Sunderban* rivers, as the species is common, adhering to wooden piles and brickwork in the Húghlí at Calcutta, as well as in waters which have periodical communication with it"
Remarks Benson based his original description on an unspecified number of shells in the collection of the Museum of the Asiatic Society, as well as material he collected himself in Calcutta. Although he did not explicitly mention his own shells under the description of *depressa*, it is clear from his description of *Neritina cornucopia* that he encountered both species 'adhering to piles and bricks' (Benson, 1836: 749). However, the specimens from the McAndrew collection in the UMZC have no record of the collector and we therefore exclude them from type series. NHMUK 1841.7.23.27 was transferred to the EIC's India Museum in London from the Museum of the Asiatic Society in 1841 and was one of the 'Sylhet' specimens listed by Pearson (1840: 729), the number 33 on the label corresponding with this list. According to Brandt (1974: 16), *N. depressa* is a junior synonym of *Neritina* (*Dostia*) *violacea* (Gmelin, 1791), now *Neripteron violaceum* (Gmelin, 1791), see Eichhorst (2016a). This species usually lives in slightly brackish water and according to Annandale and Prashad (1919: 243) it was "common on the banks of the Hugli about twenty miles below Calcutta".

Subfamily NERITININAE

Genus *Septaria* J. Férussac, 1807

Navicella compressa Benson, 1836

Accepted as *Septaria tesselata* (Lamarck, 1816);
Navicella tesselata Lamarck, 1816: 456, figs 3, 4
(changed from *tesselaria* on the same page)

Navicella compressa Benson 1836b: 750; Hanley and Theobald, 1875 [in 1870–1876]: 54, Pl. 137, Figs 1, 4
Septaria compressa (Benson); Preston, 1915: 7
Type material not located
Original measurements: "Long. 0.85, Lat. 0.45 poll."
Type locality India/Bangladesh: part of a collection "chiefly made in the hills on the N.E. Frontier of Bengal"
Remarks Benson based his original description on an unspecified number of shells in the Museum of the Asiatic Society and used the name suggested by its curator, Dr J.T. Pearson. Pearson sent the last remaining specimen from the Asiatic Society collection, which was in an "injured state", to Thomas Horsfield at the India Museum (Pearson, 1840: 730), but this specimen is not listed amongst material transferred from the India Museum to the BM in 1842 and is presumed lost. Hanley and Theobald were able to figure a specimen from the "River Hoogly" in *Conchologia Indica*, which probably came from the Benson collection. Tryon (1888b: 82) listed this as a synonym of *Navicella tessellata* Lamarck, 1822, itself a synonym of *Septaria lineata* (Lamarck, 1816). According to Haynes (2001: 191) *Navicella tesselata*

(corrected spelling) and *N. lineata*, both described by Lamarck (1816), are conspecific species of *Septaria*, a genus of brackish-water limpets that occurs in India.

Subclass CAENOGASTROPODA

Grade ARCHITAENIOGLOSSA

Superfamily CYCLOPHOROIDEA

Family CYCLOPHORIDAE [2]

Subfamily CYCLOPHORINAE

Tribe CYCLOPHORINI

Genus *Cyclophorus* Montfort, 1810

Subgenus *Cyclophorus* Montfort, 1810

***Cyclophorus* (*Cyclophorus*) *balteatus* Benson, 1857**

Cyclophorus balteatus Benson, 1857b: 207; Theobald, 1857: 247; Pfeiffer, 1858: 45; Hanley and Theobald, 1870 [in 1870–1876]: 2, Pl. 3, Fig. 1; Pfeiffer, 1875: 103, 404; Theobald, 1876a: 36; Nevill, 1878: 266
Cyclophorus (*Salpingophorus*) *balteatus* Benson; Kobelt and Möllendorff, 1897: 109; Kobelt, 1902: 126; Gude, 1921: 74
Type material not located
Original measurements: "Diam. major 40, minor 30, axis 20 mill."
Type locality Burma: "Hab. ad Pegu" [lives at Pegu]
Remarks Benson based his original description on a single shell, lacking its operculum, provided by William Theobald. Theobald (1857: 247) clarified that the given locality "Pegu" referred to the district and not the town of the same name, and later listed Benson's species as a junior synonym of his *C. haughtoni* (Theobald, 1876a: 36). No specimens labelled as *C. balteatus* could be found in the Benson collection in the UMZC, and this species is not listed amongst the registered specimens from the Theobald collection at the NHM or the Linter collection at the RAMM. The holotype is therefore presumed lost. Nevill (1878: 266) listed two specimens under this name in the Indian Museum from "Pegu; coll. Captain Berdmore, ex c. As. Soc., Bengal", but neither of these can claim to be the holotype.

***Cyclophorus cantori* (Benson, 1851)**

Cyclostoma cantori Benson, 1851e: 186–187
Cyclophorus cantori (Benson); Pfeiffer, 1858: 49; Maassen, 2001: 7
Cyclophorus (*Cyclophorus*) *cantori* (Benson); Kobelt, 1902: 135
Type material UMZC I.104195.A, **Fig. 17 A** (one of three syntypes from the R. McAndrew collection labelled "*Cyclophorus Cantori* Bens., Bens. col., Penang"; one of the large shells (UMZC I.104195.A) is associated with another label in Benson's handwriting (**Fig. 17 B**) stating "*Cyclostoma Cantori* Bens., Pulo Penang, Dr Cantor")
Original measurements: "Diam. maj. 30, minor 23, axis 19 mill.; sp. major. Diam. maj. 24, minor 19, axis 14½ mill.; sp. minor."
Type locality Malaysia: "Hab. Ad Insulam Penang. Teste Cantor" [lives on the Island of Penang, according to Cantor]
Remarks Benson based his original description on two sizes of shell provided by Theodore Cantor, one with larger measurements ("sp. major") and one smaller ("sp. minor"), although he did not mention how many specimens of each size formed his type series. The material in the UMZC consists of two large shells and a smaller one complete with operculum. Kasinathan and Natarajan (1975) included material identified as *Cyclophorus cantori* in their studies of chromosome numbers in selected species of Cyclophoridae.

***Cyclophorus convexiusculus minor* Benson, 1856**

Accepted as *Chondrocyclus convexiusculus* (Pfeiffer, 1855); *Cyclostoma* (*Cyclophorus*) *convexiusculum* Pfeiffer, 1855: 104

Cyclophorus convexiusculus Pfr. var. *minor* Benson, 1856c: 438
Chondrocylus convexiusculus Pfr. (= var. *minor* Bs); Connolly, 1929: 238; Connolly, 1939: 537
Type material not located
Original measurements: "Diam. major 4, minor 3, axis 2 mill."
Type locality South Africa: "Mr Layard discovered it in damp mould, amongst a pile of loose rocks, in a steep ravine, on the side of Table Mountain overlooking Camp's Bay …" (Benson, 1856c: 439)
Remarks The number of specimens provided by Edgar Layard was not explicitly stated in Benson's original description, which also noted that he had been able to borrow "the type specimen" of *convexiusculus* L. Pfeiffer from Hugh Cuming in order to verify the distinctness of his variety. Connolly (1929: 238) inferred that there was only one specimen, stating that "Benson's var. *minor*, described from a rather immature example in better condition than the type set… is absolutely synonymic with *convexiusculus* and the name is not worth retaining". Cole et al. (2019) have recently figured a syntype of *C. convexiusculus* and undertaken a molecular phylogeny of *Chondrocyclus*, which included specimens of *C. convexiusculus* from a site close to its type locality.

Cyclophorus (*Cyclophorus*) *flavilabris* Benson, 1860

Cyclophorus flavilabris Benson, 1860c: 193; Pfeiffer, 1865 [in 1847–1877]: 68; Hanley and Theobald, 1870 [in 1870–1876]: 1, Pl. 1, Fig. 1; Nevill, 1878: 273
Cyclophorus (*Salpingophorus*) *flavilabris* Benson; Kobelt and Möllendorff, 1897: 109; Kobelt, 1902: 129; Gude, 1921: 78
Type material not located
Original measurements: "Diam. major 51, minor 43, axis 36 mill."
Type locality Burma: "Habitat in Provincia Pegu" [lives in the province of Pegu]
Remarks Benson based his description on a single shell, lacking its operculum, provided by William Theobald, who later stated "The type of this species is the property of the Asiatic Society of Bengal, and is, I believe, unique. The shell figured [in *Conchologia Indica*] is my *C. arthriticus*" (Theobald, 1876a: 51). Nevill (1878: 273) listed two shells in the Indian Museum labelled "Pegu (types); ex c. As. Soc., Bengal", one of which is potentially the holotype. He also regarded *Cyclophorus arthriticus* Theobald, 1864, also from Pegu, as a junior synonym. In his original description of *C. arthriticus*, Theobald noted similarities with Benson's species but did not suggest they should be synonymised: "It is barely so globose as *C. flavilabris*, B. to which it is nearly allied, and from which it differs in sculpture, form and greater solidity" (Theobald, 1864: 247). Three shells survive in the Theobald collection labelled "*Cyclophorus arthriticus* Theob., Pegu" (NHMUK 1888.12.4.1960–1962).

Cyclophorus (*Cyclophorus*) *malayanus* (Benson, 1852)

Cyclostoma malayanum Benson 1852c: 269
Cyclophorus malayanus (Benson); Pfeiffer, 1854a: 82; Reeve, 1862 [in 1859–1862], 13 (*Cyclophorus*): pl. 1, species 2; Hanley and Theobald, 1872 [in 1870–1876]: 23, Pl. 48, Fig. 4; Nevill, 1878: 267
Cyclophorus (*Salpingophorus*) *malayanus* (Benson); Kobelt and Möllendorff, 1897: 109; Kobelt, 1902: 130; Gude, 1921: 80
Type material UMZC I.103870, **Fig. 17 C** (syntype from the R. McAndrew collection labelled by Benson "*Cycl. Malayanus* Bens, Pulo Penang, Theo Cantor, Type", here designated as the lectotype); NHMUK 20130089/1, **Fig. 17 E** (one of three shells from the H. Cuming collection, two of which are syntypes (NHMUK 20130089/1–2), labelled "193 *Cyc. Malayanum* Bens, Malay Peninsula, Had from himself" [i.e. Benson], with an additional note in Cuming's handwriting (see below))
Original measurements: "Diam. major 43, minor 32, axis 29 mill."
Other material UMZC I.103875.A–C (three shells from the R. McAndrew collection labelled "*Cyclophorus Malayanus* Var. Bens., Bens. col., Penang". Inside one of these shells (UMZC I.103875.A) was another label in Benson's handwriting stating "*Cycl. Malayanus* Bens. var, Pulo Penang, W. Traill")
Type locality Malaysia: "Hab. in montibus vallibusque Insularum Penang et Lancavi, necnon in Peninsula Malayana. Teste Dr. T. Cantor" [lives in the mountains and the valleys of the islands of Penang and Langkawi, as well as the Malayan Peninsula, according to Dr T. Cantor]
Remarks The number of specimens provided by Theodore Cantor was not noted in Benson's original description. UMZC I.103870 is a rare example of a Benson collection type specimen that retains its complete original label (**Fig. 17 D**), hinting at the quality of Benson's documentation before his collection was acquired by Sylvanus Hanley and Robert McAndrew. The other Cambridge lot (UMZC I.103875) consists of specimens sent to Benson by Dr William Traill, who had supplied him with a small collection of shells from Borneo a few months after his original description was published (Benson 1853a: 32) and is not part of the type series. Reeve (1861: species 2) subsequently re-published Benson's description with illustrations of a specimen from the Cuming collection. The original label that accompanies NHMUK 20130089 is apparently a rare example of Cuming's own handwriting, with a note appended to the specimen data transcribed above that reads "Mr. Benson has also sent me his *Malayanum* and the true *volvulus* for comparison. I think *Malayanum* is still a more depressed variety of *volvulus*". Nantarat et al. (2014a) observed that the two specimens without opercula from this lot are syntypes and considered that the third specimen (their Fig. 13A), which is smaller and possesses an operculum, is the example of what Benson believed to be "*volvulus*". Nantarat et al. (2019) have recently undertaken phylogenetic molecular analyses showing that *Cyclophorus volvulus* is a species complex in Thailand.

Cyclophorus (*Cyclophorus*) *porphyriticus* (Benson, 1851)

Cyclostoma porphyriticum Benson, 1851e: 187; Pfeiffer, 1854 [in 1843–1854], 1(19), 383: pl. 50, figs 22–24
Cyclostoma borneensis Metcalfe, 1852: 71

Cyclophorus porphyriticus (Benson); Pfeiffer, 1858: 49; Hanley and Theobald, 1874 [in 1870–1876]: 42, Pl. 105, Fig. 4; Nevill, 1878: 269
Cyclophorus (*Salpingophorus*) *porphyriticus* (Benson); Kobelt and Möllendorff, 1897: 109
Cyclophorus (*Salpingophorus*) *porphyreticus* (Benson); Kobelt, 1902: 132; Gude, 1921: 83
Type material UMZC I.103710, **Fig. 17 F** (syntype from the R. McAndrew collection labelled (**Fig. 17 G**) "*Cyclophorus Porphyriticus* Bens., Type, Bens. col., Bengal")
Original measurements: "Diam. major 31, minor 24½, axis 18 mill."
Type locality India "Hab. in India Orientali" [lives in East India]
Remarks The number of specimens examined was not clearly stated in Benson's original description, although he mentioned that he "received the shell from Sowerby in 1834 as one of the varieties of *C. Perdix*". Stoliczka (1872: 263–264) compared specimens of *Cyclophorus borneensis* from Singapore with the specimen of *C. porphyriticum* from Benson's collection figured by Pfeiffer (1843–1854: pl. 50, figs 22–24), concluding that the two species were conspecific and that Benson's name has priority. UMZC I.103710 and the shell figured by Pfeiffer are clearly not the same specimen, suggesting that there were originally at least two specimens in Benson's collection.

Cyclophorus scurra Benson, 1857

Cyclophorus scurra Benson, 1857b: 208; Theobald, 1857: 247; Pfeiffer, 1858: 47; Hanley and Theobald, 1874 [in 1870–1876]: 42, Pl. 105, Figs 2, 3; Nevill, 1878: 272; Gude, 1921: 90
Cyclophorus (*Eucyclophorus*) *scurra* (Benson); Kobelt and Möllendorff, 1897: 111
Cyclophorus (*Cyclophorus*) *scurra* (Benson); Kobelt, 1902: 142
Type material a neotype (UMZC I.102665, **Fig. 18 A**) from the R. McAndrew collection labelled "*Cyclophorus Scurra* Var., Bens. col., Pegu" is here designated with the express purpose of clarifying the taxonomic status of *C. scurra* (see below).
Original measurements: "Diam. major 19, minor 16, axis 14 mill."
Other material UMZC I.102660, **Fig. 18 B** (single shell from the R. McAndrew collection labelled "*Cyclophorus Scurra* Var., Bens. col., Pegu"); UMZC I.102670 (single shell with bands from the R. McAndrew collection labelled "*Cyclophorus Scurra* Var. Bens., Bens. col., Arakan"); NHMUK 1888.12.4.1931–1932 (two shells from the W. Theobald collection labelled "*Cyclophorus scurra* Bens, Arakan Hills")
Type locality Burma: "Hab. ad Pegu" [lives in Pegu]
Remarks Benson based his original description on a single shell, lacking its operculum, provided by William Theobald. UMZC I.102660 and I.102665 are from the type locality and, although marginally larger than the dimensions published by Benson, both are candidates to be the holotype. The specimens that form UMZC I.102670 and NHMUK 1888.12.4.1931–1932 are not from the type locality. Theobald (1857: 247) clarified that the type locality "Pegu" referred to the province rather than the town.

Cyclophorus (*Cyclophorus*) *theobaldianus* Benson, 1857

Cyclophorus theobaldianus Benson, 1857b: 206; Theobald, 1857: 246; Pfeiffer, 1858: 47; Reeve, 1861 [in 1859–1862], 13 (*Cyclophorus*): pl. 10, species 41; Blanford, 1865: 96; Hanley and Theobald, 1870 [in 1870–1876]: 1, Pl. 1, Fig. 2; Nevill, 1878: 266
Cyclophorus (*Salpingophorus*) *theobaldianus* Benson; Kobelt and Möllendorff, 1897: 110; Kobelt, 1902: 134; Gude, 1921: 86; Ramakrishna et al., 2010: 29
Type material UMZC I.102580.A, **Fig. 18 C** (one of two syntypes from the R. McAndrew collection, one with operculum, labelled "*Cyclophorus Theobaldianus* Bens., Bens. col., Ind."; a printed label reading "Theyet" has been pasted inside the aperture)
Original measurements: "Diam. major 50, minor 39, axis 28 mill.; aperturae alt. et lat. (perist. incl.) 29 mill."
Other material UMZC I.102585, **Fig. 18 D** (one of two shells from the R. McAndrew collection labelled "*Cyclophorus Theobaldianus* Bens., Bens. col., Thyet Myo". An accompanying label in Benson's handwriting (**Fig. 18 E**) reads "*Cycl. Theobaldianus* Bens, WTB [W.T. Blanford], Thyet Myo" and another in unknown handwriting reads "*Cyclophorus Theobaldianus* B, Thyet Myo"); NHMUK 1888.12.4.1951–1952 (two shells from the W. Theobald collection labelled "*C. theobaldianus* Bens., typical, Thyet Myo"); EXEMS: 1720/1909/D43/7/3–5 (three shells from the J.E. Linter collection labelled "*C. theobaldianus* Ben., Burmah, W.T." [William Theobald])
Type locality Burma: "Hab. ad Thyet Myo, raro occurrens" [lives at Thyet Myo, occurs rarely]
Remarks The number of specimens provided by William Theobald from "near the right bank of the Irawadi River" at Thyet Myo was not noted in Benson's original description, which included the operculum. UMZC I.102585 appears to have come from William Blanford and is therefore not considered part of the type series. According to Ramakrishna et al.

(2010) *C. theobaldianus* occurs in India (Assam) and Bangladesh (Chittagong), as well as Burma.

Cyclophorus (*Cyclophorus*) *zebrinus* (Benson, 1836)

Cyclostoma zebrinum Benson, 1836a: 355; Pfeiffer, 1852: 71
Cyclophorus zebrinus (Benson); Pfeiffer, 1858: 52; Theobald, 1858: 318; Reeve, 1861, 13 (*Cyclophorus*): pl. 11, species 46; Hanley and Theobald, 1870 [in 1870–1876]: 1, Pl. 2, Fig. 2; Godwin-Austen, 1876: 173; Nevill, 1878: 268
Cyclophorus (*Glossostylus*) *zebrinus* (Benson); Kobelt and Möllendorff, 1897: 108; Kobelt, 1902: 123
Cyclophorus (*Salpingophorus*) *zebrinus* (Benson); Gude, 1921: 86; Ramakrishna et al., 2010: 30
Type material UMZC I.102055.A, **Fig. 18 F** (one of two syntypes from the R. McAndrew collection labelled "*Cyclophorus Zebrinus* Bens., Bens. col., Teria Ghat") Original measurements: "Diam. 10.35 poll."
Other material NHMUK 1888.12.4.1956 (single shell from the W. Theobald collection labelled "*Cyclophorus zebrinus* Benson, Nanclai, type locality")
Type locality Bangladesh: part of a collection "chiefly made in the hills on the N.E. Frontier of Bengal"
Remarks The number of specimens examined was not noted in Benson's original description, which was based on material in the Museum of the Asiatic Society acquired from an expedition to "Sylhet, Cherra Poonji and the Khasi Hills" (Pearson, 1833). Pearson (1840) did not list this species amongst material transferred from the Asiatic Society to the EIC's India Museum in London, and Nevill (1878: 268) did not mention any Asiatic Society specimens in his handlist of material in the Indian Museum. The two Benson collection shells are of very different sizes. The specimen illustrated here is the larger and matches more closely the dimensions given in the original description. *Cyclophorus zebrinus* is widely distributed in India and has been also recorded from Bangladesh, China and Burma (Ramakrishna et al., 2010). Nantarat et al. (2014b) included *C. zebrinus* in a phylogenetic analysis of *Cyclophorus* from Thailand.

Subgenus *Kobeltostylus* Egorov, 2006 (= *Litostylus* Kobelt & Möllendorff, 1897)

Cyclophorus (*Kobeltostylus*) *involvulus* (Benson, 1835) non O.F. Müller, 1774

Provisionally accepted as
Cyclophorus (*Kobeltostylus*) *involvulus* (O.F. Müller, 1774); *Helix involvulus* Müller, 1774: 84

Cyclostoma involvulus Benson, 1835d: 462
Cyclophorus involvulus (O.F. Müller, 1774); Reeve, 1861 [in 1859–1862], 13 (*Cyclophorus*): Pl. 1, Fig. 1; Hanley and Theobald, 1870 [in 1870–1876]: 1, Pl. 2, Fig. 1
Cyclophorus (*Litostylus*) *involvulus* (O.F. Müller, 1774); Kobelt and Möllendorff, 1897: 105; Kobelt, 1902: 99; Gude, 1921: 47
Type material not located
Type locality India: "the rocks of Sicrigully, and among loose brick rubbish and under felled timber, in the fort of Rajmahal in Bahár…"
Remarks This name is a junior secondary homonym of, and has been synonymised with, *Helix involvulus* O.F. Müller, 1774 (Gude, 1921: 47), which is the type species of the subgenus *Litostylus* Kobelt & Möllendorff, 1897 (now *Kobeltostylus* Egorov, 2006). However, as discussed below, it is not clear whether the specimens described by Benson are the same as those of Müller. Benson (1835d: 462) originally attributed the name to Gray, presumably referring to the latter's unpublished Descriptive Catalogue of Shells (see Sherborn, 1909 for an account of this work). Benson later attributed the name to Müller, also stating that his species "is *Cyclostoma torquata* of Lieut. Hutton, J.A.S. vol. iii, page 82, and the species alluded to by me in vol. I, page 12, in my remarks on the genus *Pterocyclos*" (Benson 1836a: 355). Hutton's name is available and, if conspecific, would therefore have priority over Benson's *involvulus*. Benson's original description of *involvulus* merely stated that the adult shell has a continuous and thickened peristome, a reflected lip and an aperture that is bright orange. As well as its occurrence in India and Bangladesh, Benson (1851a: 265) recorded a variety of *involvulus* from Galle, Sri Lanka, which had a double peristome. Müller (1774: 84) gave no locality in his description of *H. involvulus*, but there are two possible syntypes of this species at the Natural History Museum of Denmark, University of Copenhagen (ZMUC-GAS-249 and ZMUC-GAS-550). These shells have a whitish aperture, but both are very worn and faded. One of these shells (ZMUC-GAS-550) has an original label with the locality "Tranquebar" (modern-day Tharangambadi in eastern Tamil Nadu, India); this would be the type locality (ICZN, 1999, Article 76A.1.1). Recent molecular work on what had been thought to be wide ranging species of *Cyclophorus,* including supposed records of *C. involvulus* in Thailand and in Vietnam, proved to be complexes of cryptic species (Nantarat et al., 2014; P. von Oheimb, et al., 2018, K. von Oheimb et al. 2019). Although Nantarat et al., (2014) associate *C. involvulus* with a Thai species, southern Indian examples were not included in their analysis and the true range of the species is therefore unknown. In view of what have

proven to be localised distributions of a number of species that possess shells similar to those of *C. involvulus* in Southeast Asia, it seems likely that cryptic species with shells similar to *C. involvulus* also occur in South Asia. The biological status of Asian *Cyclophorus* can only be understood when molecular phylogenetic trees are established for their full geographical range and untangling their nomenclatural status will require detailed reviews of available names and of their types.

Cyclophorus (*Kobeltostylus*) *jerdoni* (Benson, 1851)

Cyclostoma jerdoni Benson, 1851e: 185; Pfeiffer, 1854 [in 1843–1854], 1(19), 382: pl. 50, figs 1–3
Cyclophorus jerdoni (Benson), Pfeiffer, 1852: 71; Pfeiffer, 1858: 51; Reeve, 1861 [in 1859–1862], 13 (*Cyclophorus*): pl. 5, species 20; Hanley and Theobald, 1870 [in 1870–1876]: 16, Pl. 33, Figs, 5, 6; Raheem *et al.*, 2014: 25, Figs 8A–B
Cyclophorus polynema var. *jerdoni* Benson; Nevill, 1878: 272
Cyclophorus (*Litostylus*) *jerdoni* (Benson); Kobelt and Möllendorff, 1897: 105; Kobelt, 1902: 99; Gude, 1921: 48; Ramakrishna et al., 2010: 25
Type material UMZC I.103685.A, **Fig. 19 A** (lectotype designated by Raheem and Naggs (Raheem et al. 2014: 25, Fig. 8A) from the R. McAndrew collection, associated with a label in Benson's handwriting that reads "Nilgherries, Jerdon, N & E Face, in forest, fig'd by Pfeiffer"); UMZC I.103685.B, **Fig. 19 B** (paralectotype from the same lot labelled "N E face of Nilgherries in Forest")
Original measurements: "Diam. maj. 35, min. 28, axis 20 mill."
Type locality India: "Hab. ad latus montium Nilgherries. Teste Jerdon" [lives on the flanks of the Nilgiri Hills according to Jerdon]
Remarks The number of specimens provided by Thomas Jerdon was not noted in Benson's original description, which did not mention the operculum. Benson (1852c: 269) subsequently noted: "Dr. T. Jerdon procured it [*Cyclophorus nilagiricus*] from forest on the western edge of the Nilgherries, while *C. Jerdoni* was found by him to inhabit the north-east face of the same mountain group". This species is endemic to the Western Ghats (Raheem et al., 2014). Kasinathan and Natarajan (1975) included material identified as *Cyclophorus jerdoni* in their studies of chromosome numbers in selected species of Cyclophoridae.

Cyclophorus (*Kobeltostylus*) *nilagiricus* (Benson, 1852)

Cyclostoma nilagiricum Benson, 1852c: 268
Cyclophorus nilagiricus (Benson); Pfeiffer, 1854a: 83; 1858: 52; Reeve, 1861 [in 1859–1862], 13 (*Cyclophorus*): pl. 2, species 6; Hanley and Theobald, 1870 [in 1870–1876]: 1, Pl. 1, Fig. 5; Raheem et al., 2014: 25, Figs 8C–D
Cyclophorus (*Litostylus*) *nilagiricus* (Benson); Kobelt and Möllendorff, 1897: 105; Kobelt, 1902: 101; Gude, 1921: 51; Ramakrishna et al., 2010: 25
Type material UMZC I.103890.A, **Fig. 19 C** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 25, Fig. 8C), associated with a label in Benson's handwriting that reads "No. 1 of Jerdon, *Cyclostoma nilagiricum* Benson, West edge of Nilgherries in forest"); UMZC I.103890.C, **Fig. 19 D** (paralectotype labelled "Nilgherries"); UMZC I.103890.B and D–H (six paralectotypes)
Original measurements: "Diam. major 43–45, minor 34–36, axis 22–24 mill."
Type locality India: "Hab. ad latus occidentale Montium Nilgherries teste Jerdon" [lives on the western side of the Nilgiri Hills according to Jerdon].
Remarks The number of specimens provided by Thomas Jerdon was not noted in Benson's original description, which did not mention the operculum. However, there was clearly more than one because he provided size ranges in his measurements of the shell. Benson noted: "Dr. T. Jerdon procured it from forest on the western edge of the Nilgherries, while *C. Jerdoni* was found by him to inhabit the north-east face of the same mountain group" (Benson, 1852c: 268). This species is endemic to the Western Ghats (Raheem et al., 2014).

Cyclophorus (*Kobeltostylus*) *pyrotrema* Benson, 1854

Cyclophorus pyrotrema Benson, 1854b: 412; Pfeiffer, 1858: 45; Reeve, 1861 [1859–1862], 13 (*Cyclophorus*): pl. 4, species 13; Hanley and Theobald, 1870 [in 1870–1876]: 2, Pl. 2, Fig. 10, + var. Fig. 9; Nevill, 1878: 272
Cyclophorus (*Litostylus*) *pyrotrema* Benson; Kobelt and Möllendorff, 1897: 106; Kobelt, 1902: 103; Gude, 1921: 54; Ramakrishna et al., 2010: 26
Cyclophorus (*Kobeltostylus*) *pyrotrema* Benson; Budha et al., 2015: 3
Type material UMZC I.103845.A, **Fig. 19 E** (one of three syntypes, accompanied by labels in Benson's handwriting that read "*Cycl. Pyrotrema* Bens, Outliers of Rajmahal Range – 1831, typical" (**Fig. 19 F**) and "*Cycl. Pyrotrema* Bens, Outliers of Rajmahal Range 1831, perist. simpli: albi."); UMZC I.103850.A–B (two syntypes from the R. McAndrew collection labelled

"*Cyclophorus Pyrotrema* Bens. var. *Nana*, Bens. col., Rajmahal, Darjiling"); UMZC I.103840 (three syntypes from the R. McAndrew collection labelled "*Cyclophorus Pyrotrema* Bens., Bens. col., Himalayas"); UMZC I.103855 (two syntypes from the R. McAndrew collection labelled "*Cyclophorus Pyrotrema* Bens. Var. *Palida*, Bens. col., Darjiling"); UMZC I.104585 (four syntypes from the R. McAndrew collection labelled "*pyrotrema*, Bens. col.") Original measurements: "Diam. major 36, minor 30, alt. 26 mill.; Diam. major 34, minor 28, alt. 24 mill.; Diam. major 26, minor 21, alt. 18 mill."

Type locality India: "Hab. ad Sikrigali et Patharghata, Bahar, et ad Rajmahal Bengaliae. In rupibus umbrosius et sub arboribus, inter folia emortua, annis 1831 et 1835, ipse detex" [lives at Sikrigali and Patharghata, Bahar, and at Rajmahal in Bengal. The same person [A.E. Benson] discovered it in the years 1831 and 1835 in the shade of rocks and under trees, amongst dead leaves.]

Remarks The number of specimens provided by Arthur Benson was not recorded in Benson's original description, which included the operculum. However, there were clearly several, since Benson provided three sets of measurements and included details of two unnamed varieties: "A variety occurs in which the shell is of a pale buff colour, darker towards the apex, the bands and markings being obsolete, and the colour of the peristome being equally vivid with that of the typical shells. Another thinner variety occurs, in which the interior coloured lip is not present". This species has been identified from Bangladesh, India, Burma and Nepal (Budha et al., 2015).

Subgenus *Glossostylus* Kobelt & Möllendorff, 1897

Cyclophorus (*Glossostylus*) *altivagus* Benson, 1854

Cyclophorus altivagus Benson, 1854b: 411; Pfeiffer, 1858: 57; Reeve, 1861 [in 1859–1862], 13 (*Cyclophorus*): pl. 13, species 55; Hanley and Theobald, 1870 [in 1870–1876]: 16, Pl. 34, Figs 2, 3; Nevill, 1878: 265; Raheem et al., 2014: 24, Figs 7A–C

Cyclostoma stenomphalum var *aurora* Pfeiffer, 1854 [in 1843–1854]: 384, pl. 50, figs 11–13 (non Benson, 1851)

Cyclophorus (*Glossostylus*) *altivagus* Benson; Kobelt and Möllendorff, 1897: 106; Kobelt, 1902: 106; Gude, 1921: 56; Ramakrishna et al., 2010: 21

Type material UMZC I.103835.A, **Fig. 20 A** (neotype designated by Raheem and Naggs (Raheem et al., 2014: 24, Fig. 7A) from the R. McAndrew collection accompanied by a label in Benson's handwriting that reads "Punah … Mahabaleshwar") Original measurements: "Diam. major 31, minor 26, alt. 24½ mill. Apert. intus 17 mill. longa, 15 lata."

Other material UMZC I.103835 (six other shells from the neotype lot, some of which were individually labelled: UMZC I.103835.D, labelled by Hanley "*altivagus* var. figured in C. Indica. Was *Aurora*" and UMZC I.103835.E, labelled in Benson's handwriting "*Cycl. altivagus* B. Mahabaleshwar")

Type locality India: "Hab. in summis montibus Mahabaleshwar Indiae Meridionalis. Detexit A.E. Benson" [lives on the summits of the mountains at Mahabaleshwar, Southern India. Discovered by A.E. Benson]

Remarks Benson's original description was based on a single decorticate specimen, lacking its operculum, found by his son, Arthur Benson. Raheem and Naggs (Raheem et al., 2014: 24, Fig. 7A) designated a neotype (see above) since the heavily worn specimen on which Benson's description was based is now apparently lost. This species is endemic to the Western Ghats (Raheem et al., 2014).

Cyclophorus (*Glossostylus*) *aurora* (Benson, 1851)

Cyclostoma aurora Benson, 1851e: 186; 1853c: 272

Cyclophorus aurora (Benson); Pfeiffer, 1852: 72; Pfeiffer, 1858: 51; Reeve, 1861 [in 1859–1862], 13 (*Cyclophorus*): pl. 9, species 36; Hanley and Theobald, 1870 [in 1870–1876]: 2, Pl. 3, Fig. 4; Nevill, 1878: 265; Godwin-Austen, 1886 [in 1882–1888]: 205, pl. 51, figs 1, 2–2d

Cyclophorus (*Glossostylus*) *aurora* (Benson); Kobelt and Möllendorff, 1897: 106; Kobelt, 1902: 107; Gude 1921: 57; Ramakrishna et al., 2010: 21

Type material NHMUK 1954.6.2.1535, **Fig. 20 C** (holotype from the J.S. Hawkins collection labelled "*Cyclophorus Aurora* Bens., Dagiling, Himalayas, W.H. Benson Esq." accompanied by a label in Benson's handwriting stating "*Cyclophorus Aurora* Bens, Darjiling Himalaya")

Original measurements: "Diam. maj. 28, min. 23, axis 19 mill."

Other material UMZC I.103550.A, **Fig. 20 D** (one of two shells from the R. McAndrew collection labelled "*Clycostoma* [sic] *Aurora* Var. Bens., Bens. col., Darjiling". Behind the operculum is a printed label reading "Darjeeling, 8" pasted onto the palatal surface of the aperture, was another label stating "*Cyclost Aurora* var. Benson [& operculum] A of series Darjiling, not *stenomphalus* of Pfr originally [illegible]");UMZC I.103555.A, **Fig. 20 E** (one of three shells from the R. McAndrew collection labelled "*Cyclophorus Aurora* Bens., Bens. col., Darjiling", with another label in Benson's handwriting (**Fig. 20 F**) that reads "*Cycloph Aurora* Bens., Darjiling, var.

chosen by Pfeiffer for figuring out of a series"; another label, also apparently in Benson's handwriting, includes the name "H. Blanford"); UMZC I.103535 (three shells from the R. McAndrew collection labelled "*Cyclostoma Aurora* Var. Bens., Bens. col., Darjiling"; a label inside the smallest shell, apparently in Benson's handwriting, reads "young of *Cycl.* [*stenomphalus*] Pfr. Darjiling"); UMZC I.103540 (single shell with an operculum from the R. McAndrew collection labelled "*Cyclostoma Aurora* Var. Bens., Bens. col., Darjiling"; a small, printed label that reads "Darjeerling" has been pasted into the aperture); UMZC I.103545 (single shell from the R. McAndrew collection labelled "*Cyclostoma Aurora* Var. Bens., Bens. col., Darjeeling"); UMZC I.103560 (two shells from the R. McAndrew collection labelled "*Cyclostoma Aurora* Var. Bens., Bens. col., Darjiling")

Type locality India: "Hab. ad Darjiling Regionis Sikkimensis ad montes Himalayanos" [lives at Darjiling in the Sikkim Region of the Himalayan Mountains]

Remarks The number of specimens examined was not clearly stated in Benson's original description, which did not mention the operculum: "the species is decorticate, but [there is] colouring apparent on the body whorl within the aperture, where it is protected by transparent enamel" and "it would appear that the fresh shell is surrounded, in the portion above the umbilicus, by narrow chestnut bands closely set" (Benson, 1851e: 186). In an extended description that included the operculum, based on specimens subsequently provided from Darjiling by Robert Trotter, Benson referred to his original description and stated: "The shell described was an uncoated and worn specimen" (Benson, 1852c: 272), clearly alluding to a single shell in poor condition. The NHM specimen from the J.S. Hawkins collection conforms closely to Benson's published measurements and the above-mentioned descriptions, being a worn shell devoid of periostracum but retaining vestiges of colouration and banding within the aperture. We therefore consider NHMUK 1954.6.2.1535 to be the holotype, and the UMZC lots to represent material acquired subsequently. In a letter to Charles Darwin (Benson, 1855b), Benson mentioned numerous specimens "collected for me by a resident at the station [i.e. Darjiling], and by a friend who visited it 15 years afterwards". Reeve (1861: [in 1859–1862], 13 (Cyclophorus): species 36) explained that "Doubts were entertained of the value of this species originally, and it was figured by Pfeiffer in Küster, *Conch. Cab*. Pl. 50 f.11 to 13, as a variety of his *C. stenomphalus*. The shell represented at Fig. 36 a, b, is one of a very characteristic series of specimens which Mr. Benson has since received from Sikkim-Himalaya, and all doubt on the subject is now removed." In India *C. aurora* has been recorded from Arunachal Pradesh, Assam, Mizoram, Sikkim and West Bengal and it also occurs in Bhutan (Gittenberger et al., 2017a).

Cyclophorus (*Glossostylus*) *cryptomphalus* Benson, 1857

Cyclophorus cryptomphalus Benson, 1857b: 206; Theobald, 1857: 247; Pfeiffer, 1858: 58; Reeve, 1861 [in 1859–1862], 13 (*Cyclophorus*): pl. 9, species 37; Hanley and Theobald, 1870 [in 1870–1876]: 2, Pl. 3, Fig. 7; Nevill, 1878: 270

Cyclophorus (*Salpingophorus*) *crypomphalus* Benson; Kobelt and Möllendorff, 1897: 107; Kobelt, 1902: 110

Cyclophorus (*Glossostylus*) *cryptomphalus* Benson; Gude, 1921: 59

Type material a neotype (NHMUK 20130114/1, **Fig. 21 C**), one of two shells from the Cuming collection labelled "Type, Ava, Very Rare, M.C." [Museum Cuming], is here designated with the express purpose of clarifying the taxonomic status of *C. cryptomphalus* (see below)

Original measurements: "Diam. major 40, minor 32, axis 25 mill."

Other material UMZC I.102605, **Fig. 21 D** (single shell from the R. McAndrew collection labelled "*Cyclophorus Cryptomphalus* Bens., Bens. col.", no locality data); NHMUK 20190025/1, **Fig. 21 E** (one of four shells from the W.T. Blanford collection labelled "*C. cryptomphalus*, Ava, type" with a additional note (**Fig. 21 F**) stating "Blanford's label with "type" written on it was lying nearest to white example, but it may refer to all four as typical"); NHMUK 1888.12.4.1939 (single shell from the W. Theobald collection labelled "*C. cryptomphalus* Benson, Ava (type)")

Type locality Burma: "Hab. in regione Ava regni Burmanorum" [lives in the Ava region of the Kingdom of Burma]

Remarks Benson's original description was based on a single shell, lacking its operculum, provided by Thomas Oldham: "The only specimen received is in a very bad condition in respect to surface". Despite the presence of labels claiming type status, neither of the well-preserved shells in the Cuming collection can be the holotype. UMZC I.102605 is also reasonably well preserved and NHMUK 1888.12.4.1939, although partly smashed, is otherwise in relatively good condition. The heavily weathered example from the Blanford collection, tentatively labelled as the type, closely matches the measurements given in the original description and could be the specimen examined by Benson, although there is no indication that it was given to Blanford by either Oldham or Benson. Given

these uncertainties, we therefore designate NHMUK 20130114/1 as the neotype. Nantarat et al. (2014b) included *C. cryptomphalus* in a phylogenetic analysis of *Cyclophorus* from Thailand.

Cyclophorus (*Glossostylus*) *cybeus* (Benson, 1857)

Leptopoma cybeus Benson, 1857b: 205; Pfeiffer, 1858: 74; Pfeiffer 1860 [in 1854–1869], 2, 146: pl. 37, figs 28–30; Reeve, 1862 [in 1859–1862], 13 (*Leptopoma*): pl. 1, species 7
Cyclophorus cybeus (Benson); Hanley and Theobald, 1870 [in 1870–1876]: 3, Pl. 6, Fig. 1; Nevill, 1878: 268
Cyclophorus (*Glossostylus*) *zebrinus*, var *cybeus* (Benson); Kobelt and Möllendorff, 1897; 1899: 133
Cyclophorus (*Glossostylus*) *zebrinus*, var *cybea* (Benson); Kobelt, 1902: 123
Cyclophorus (*Glossostylus*) *cybeus* (Benson); Gude, 1921: 60; Ramakrishna et al., 2010; 22
Type material UMZC I.102610, **Fig. 21 A** (holotype from the R. McAndrew collection labelled "*Leptopoma Cybeus* Bens., Bens. col., Khasia Hills")
Original measurements: "Diam. major 20, minor 16, axis 14 mill."
Other material UMZC I.102615, **Fig. 21 B** (single shell from the R. McAndrew collection labelled "*Leptopoma Cybeus* Benson, India", no collection data); NHMUK 1888.12.4.2046–2047 (two shells from the W. Theobald collection labelled "*Leptopoma cybeus* Benson, Khasi Hills")
Type locality India: "Hab. ad Nanclai, raro" [lives at Nanclai, rarely]
Remarks Benson's original description, which included the operculum, was based on a single damaged shell provided by William Theobald. UMZC I.102610 conforms to Benson's original description and measurements, although its operculum is now missing. We nevertheless accept this specimen as the holotype. Nanclai is likely to be Nongkhlaw, which is in the Khasia Hills, and therefore consistent with the type locality given for UMZC I.102610.

Cyclophorus exul Benson, 1854

Accepted as *Cyclophorus* (*Glossostylus*) *himalayanus* L. Pfeiffer, 1852; *Cyclophorus himalayanus* Pfeiffer, 1852: 55

Cyclophorus exul Benson, 1854b: 412; Pfeiffer, 1858: 46; Reeve, 1861 [in 1859–1862], 13 (*Cyclophorus*), pl. 13, species 53; Hanley and Theobald, 1872 [in 1870–1876]: 22, Pl. 47, Fig. 7; Nevill, 1878: 265
Cyclophorus (*Glossostylus*) *exul* Benson; Kobelt and Möllendorff, 1897: 107; Kobelt, 1902: 111; Gude, 1921: 60; Ramakrishna et al., 2010: 22
Type material UMZC I.103830, **Fig. 20 F** (syntype from the R. McAndrew collection labelled "*Cyclophorus Exul* Bens., Bens. col., Bhamoury, Himals" [Himalaya])
Original measurements: "Diam. major 25½, min. 20, alt. 17 mill. Apert. intus 13 mill. longa."
Type locality India: "Hab. ad Bhamoury, ad pedem montium Rohillano-Himalayanorum. Detexit W.J.M. Boys" [lives at Bhamoury, at the foot of the Rohilla-Himalaya mountains. Discovered by W.J.M. Boys]
Remarks The number of specimens provided by Capt. William Boys was not noted in Benson's original description, which did not include details of the operculum. Hanley and Theobald (1872 [in 1870–1876]) suggested that there was only one specimen: "The delicate shell here depicted is unique." Nevill (1878: 265) doubted the validity of this species, believing it to be a small variety of *C. himalayanus* L. Pfeiffer, 1852.

Cyclophorus (*Glossostylus*) *pearsoni* (Benson, 1851)

Cyclostoma pearsoni Benson, 1851e: 185; Pfeiffer, 1854 [in 1843–1854], 1(19), 380: pl. 49, figs 34–36
Cyclophorus pearsoni (Benson); Reeve, 1861 [in 1859–1862], 13 (*Cyclophorus*): pl. 3, species 10; Hanley and Theobald, 1872 [in 1870–1876]: 23, Pl. 48, Fig. 5; Nevill, 1878: 271
Cyclophorus (*Glossostylus*) *pearsoni* (Benson); Kobelt and Möllendorff, 1897: 107; Kobelt, 1902: 116; Gude, 1921: 65; Ramakrishna et al., 2010: 24
Type material UMZC I.103675, **Fig. 22 A** (syntype from the R. McAndrew collection accompanied by a label in Benson's handwriting (**Fig. 22 B**) that reads "10. *Cycloph. Pearsoni* Bens. Type specimen. Khasiah Hills"); UMZC I.103680 (syntype from the R. McAndrew collection accompanied by a label in Benson's handwriting that reads "*Cyclost. Pearsoni* Bens. Khasya Hills" and on the reverse side "Fig[d] by Pfeiffer")
Original measurements: "Diam. major 42, minor 33, axis 25 mill."
Type locality India: "Hab. in montibus Khasya dictis, ultra fines Provinciae Bengaliae, ad orientem spectantes" [lives in the so-called Khasya Hills, beyond the borders of Bengal Province, observable to the east]
Remarks The number of specimens provided by Dr J.T. Pearson was not noted in Benson's original description, which did not include the operculum. The illustration published in the first part of *Conchologia Indica* (Hanley and Theobald, 1870 [in 1870–1876]: 1, Pl. 1, Fig. 6) was not *pearsoni* (see Hanley and Theobald, 1876 [in 1870–1876]: xv) and was superceded by an illustration of "Benson's type" in a subsequent part (Hanley and Theobald, 1872 [in 1870–

1876]: 23, Pl. 48, Fig. 5). This species has recently been recorded from Bhutan (Gittenberger et al., 2017a).

Cyclophorus (*Glossostylus*) *tryblium* Benson, 1854

Cyclophorus tryblium Benson, 1854b: 413; Pfeiffer, 1858: 45; Hanley and Theobald, 1872 [in 1870–1876]: 23, Pl. 48, Fig. 1; Nevill, 1878: 265
Cyclophorus (*Glossostylus*) *tryblium* Benson; Kobelt and Möllendorff, 1897: 108; Kobelt, 1902: 120; Gude, 1921: 68; Ramakrishna et al., 2010: 24
Type material UMZC I.103810, **Fig. 22 C** (holotype from the R. McAndrew collection accompanied by Benson's original label (**Fig. 22 D**) that reads "*Cyclophorus tryblium* Bens, Darjiling, original specimen")
Original measurements: "Diam. major 47, minor 38, alt. 29 mill. Apert. intus 20 mill. longa."
Other material UMZC I.103815.A, **Fig. 22 E** (one of two shells from the R. McAndrew collection labelled "*Cyclophorus tryblium* Bens., Bens. col., Darjiling, Dr H. Chapman")
Type locality India: "Hab. ad Darjiling. Detexit. H. Chapman" [lives at Darjiling. Discovered by H. Chapman]
Remarks Benson based his description on one shell, lacking its operculum: "I find a single specimen, not in fine condition, among shells kindly collected at my request by Dr. Chapman". The label accompanying UMZC I.103810 states that it is the "original specimen" [i.e. the holotype]. UMZC I.103815.A also has a label in Benson's handwriting that reads: "note the absence of ridges below in both specimens with reference to Pfeiffers observations about *C. Himalayanas*" (**Fig. 22 F**).

Genus *Craspedotropis* W.T. Blanford, 1864

Craspedotropis cuspidata (Benson, 1851)

Cyclostoma cuspidatum Benson, 1851e: 189; Pfeiffer, 1854 [in 1843–1854], 1(19), 378: pl. 49, figs 21–23
Cyclophorus cuspidatus (Benson); Benson, 1854b: 415; Pfeiffer, 1858: 62; Reeve, 1861 [in 1859–1862], 13 (*Cyclophorus*): pl. 19, species 93; Blanford, 1864: 454
Cyclophorus (*Craspedotropis*) *cuspidatus* (Benson); Nevill, 1878: 278
Craspedotropis cuspidatus (Benson); Hanley and Theobald, 1875 [in 1870–1876]: 54, Pl. 135, Figs 1, 4
Craspedotropis cuspidata (Benson); Kobelt and Möllendorff, 1897: 86; Kobelt, 1902: 68, Fig. 13; Gude, 1921: 16, Fig. 7; Ramakrishna et al., 2010: 30; Raheem et al., 2014: 36, Fig. 18D–E
Type material UMZC I.103720.A–D (four syntypes from the R. McAndrew collection labelled "*Cyclophorus Cuspidatus* Bens., Bens. col., Nilgherries", one of which (UMZC I.103720.A, **Fig. 23 A**) is here designated as the lectotype)
Original measurements: "Diam. major 6, minor 5, alt. 4 mill."
Other material NHMUK20110213/1, **Fig. 23 B** (specimen from the H.F. Blanford collection labelled "Fairlawns, Ootacamund, Nilgiris")
Type locality India: "Hab. ad apices montium Nilgherries. Teste Jerdon" [lives on the peaks of the Nilgiri Hills according to Jerdon]
Remarks The number of specimens provided by Thomas Jerdon was not noted in Benson's original description, which did not mention the operculum. The UMZC specimens were overlooked by Raheem and Naggs, who designated a neotype (NHMUK 20110213/1) from the H.F. Blanford collection (Raheem et al. 2014: 36); this neotype designation is therefore set aside in accordance with ICZN Article 75.8. This species, which is the type of *Craspedotropis* W.T. Blanford, 1864, is endemic to the Western Ghats (Raheem et al., 2014).

Genus *Lagocheilus* W.T. Blanford, 1864 [3]

Lagocheilus scissimargo (Benson, 1856)

Cyclophorus ? *scissimargo* Benson, 1856e: 228; Pfeiffer, 1858: 61; Pfeiffer, 1860 [in 1854–1869], 2, 144: pl. 37, figs 19–21
Cyclophorus scissimargo Benson; Theobald, 1857: 247; Reeve, 1861 [in 1859–1862], 13 (*Cyclophorus*): pl. 20, species 105
Lagocheilus scissimargo (Benson); Hanley and Theobald, 1870 [in 1870–1876]: 3, Pl. 6, Fig. 7; Nevill, 1878: 282
Lagochilus (*Lagochilus*) *scissimargo* (Benson); Kobelt and Möllendorff, 1897: 84
Japonia (*Lagochilus*) *scissimargo* (Benson); Kobelt, 1902: 53; Gude, 1921: 11
Type material UMZC I.102945.A, **Fig. 24 A** (one of two syntypes from the R. McAndrew collection labelled "*Cyclophorus Scissimargo* Bens., Bens. col., Phie Than")
Original measurements: "Diam. major 7, minor 5½, alt. 7 mill.
Other material NHMUK 1888.12.4.316–317 (two shells from the W. Theobald collection labelled "*Lagocheilus scissimargo* Benson, Phaiethan")
Type locality Burma: "Hab. ad Phie Than vallis Tenasserim, raro occurrens" [lives at Phie Than in the Tenasserim valley, occurs rarely]

Remarks The number of specimens provided by William Theobald was not noted in Benson's original description, which did not include the operculum. The type species of *Lagocheilus* W.T. Blanford, 1864 (*Lagochilus* Kobelt and Möllendorff, 1897 is an unjustified emendation under ICZN, 1999, Article 32) is *Cyclostoma scissimargo* Benson, 1856 by original designation.

Lagocheilus trilirata quadrifilosa (Benson, 1852)

Cyclostoma quadrifilosum Benson, 1852c: 270
Cyclophorus ? *quadrifilosus* Benson; Pfeiffer, 1854a: 84
Japonia (*Lagochilus*) *trilirata* var. *quadrifilosa* (Benson); Kobelt, 1902: 57
Type material a neotype (UMZC I.104675.A, **Fig. 24 B**, one of five shells from the R. McAndrew collection labelled "*Cyclophorus Quadrifilosus* Bens., *C. Triliratus* Pfr., Bens. col., Borneo") is here designated with the express purpose of clarifying the taxonomic status of *C. quadrifilosum* (see below)
Original measurements: "Diam. major 6, minor 5, axis 5 mill."
Type locality Borneo: "Hab. in Insula Borneo" [lives on the Island of Borneo]
Remarks Benson (1852c: 270) mentioned two specimens (i.e. syntypes) in his original description of this species, which did not include the operculum. He later published details of shells from "Pulo Pappan, near Labuan [Borneo], among dead leaves, on clayey ground" supplied to him by Dr Traill (Benson, 1853a: 32), and it appears that he combined these specimens with his original type series to form a single lot. Because the original type series can no longer be identified we have therefore selected one of these specimens as the neotype. This species is now placed in the genus *Lagocheilus*.

Lagocheilus tomotrema (Benson, 1857)

Cyclophorus ? *tomotrema* Benson, 1857b: 206; Pfeiffer, 1858: 50; Pfeiffer, 1865: 76
Cyclophorus (*Lagocheilus*) *tomotrema* Benson; Pfeiffer, 1875: 122, 409
Lagocheilus tomotrema (Benson); Blanford, 1864: 452; Hanley and Theobald, 1870 [in 1870–1876]: 3, Pl. 6, Fig. 8; Godwin-Austen, 1876: 174; Nevill, 1878: 282
Lagochilus tomotrema (Benson); Kobelt and Möllendorff, 1897: 84
Japonia (*Lagochilus*) *tomotrema* (Benson); Kobelt, 1902: 56; Gude, 1921: 12; Ramakrishna et al., 2010: 40
Type material a neotype (NHMUK 1888.12.4.312, **Fig. 24 C**, one of three shells from the W. Theobald collection labelled "*Leptopoma tomotrema* Bens, Khasi Hills" is here designated with the express purpose of clarifying the taxonomic status of *C. tomotrema* (see below)
Original measurements: "Diam. 5½, axis 5 mill."
Type locality India: "Khasi Hills"
Original locality India: "Hab. ad Teria Ghat, raro. Teste W. Theobald" [lives at Teria Ghat, rare, according to W. Theobald]
Remarks The number of specimens provided by William Theobald, none of which possessed opercula, was not noted in Benson's original description. In the absence of specimens from the Benson collection, the shells from the Theobald collection are noteworthy since they come from the type locality (Teria Ghat is in the Khasia Hills) and were probably collected at the same time. We therefore designate one of these as the neotype. Since the taxonomic status of *Japonia* is uncertain (see Taxonomic Notes), this species is referred to *Lagocheilus*. According to Ramakrishna et al. (2010) this species is widely distributed in N.E. India.

Genus *Leptopoma* L. Pfeiffer, 1847

Subgenus *Trocholeptopoma* Möllendorff & Kobelt, 1897

Leptopoma (*Trocholeptopoma*) *apicatum* Benson, 1856

Leptopoma apicatum Benson, 1856d: 95; Pfeiffer, 1858: 73; Reeve, 1862 [in 1859–1862], 13 (*Leptopoma*): pl. 6, species 33; Hanley and Theobald, 1876 [in 1870–1876]: 56, Pl. 142, Fig. 1; Nevill, 1878: 281
Leptopoma (*Trocholeptopoma*) *apicatum* Benson; Kobelt and Möllendorff, 1897: 80; Kobelt, 1902: 18; Gude, 1921: 2
Type material a neotype (NHMUK 20190426/1, **Fig. 23 C,** one of five shells from the J.J. MacAndrew collection labelled "*Leptopoma apicatum* Benson, Ceylon") is here designated with the express purpose of clarifying the taxonomic status of *L. apicatum* (see below)
Original measurements: "Diam. major 10½, min. 9, axis 9 mill."
Other material UMZC I.103070 (two shells from the R. McAndrew collection labelled "*Leptopoma Apicatum* Benson, Ceylon", no collection data)
Type locality Sri Lanka: "Hab. in Insula Ceylon (ad Portas Curuwitty dictas provinciae Sufragam?)" [lives on the island of Ceylon (at the so-called Curuwitty Pass of the Sufragam Province?)]
Remarks Benson's original description mentioned three specimens in Edgar Layard's collection, which he identified as the "small *Cyclostoma*" found in the

Curuwitty Pass, mentioned by Layard in his "*Rambles in Ceylon*". The Layard collection specimens could not be traced. The status of the two UMZC specimens is uncertain and there is no label to indicate that they are part of the type series or even definitely from the Benson collection. The smaller specimen agrees with Benson's measurements but in other respects the specimens do not show several characters mentioned by Benson, such as a double peristome or an acutely angulate periphery. Moreover, neither of these shells has a reddish-black apex (rather dull/faded in the smaller shell and white in the larger shell), the number of whorls is well over 5, and the umbilicus is only partly covered by the columellar margin. The NHM specimens appear to be an amalgamation of two lots, sourced from the shell dealers Sowerby and Fulton: three shells are in excellent condition, complete with opercula, and conform closely to the characters mentioned by Benson. The other two are bleached (although retain the dark apex) and lack opercula. Whether any of these shells originated from the Layard collection, part of which was sold through Sowerby and Fulton, is unrecorded. Reeve 1862 [in 1859–1862] illustrated a shell from the Cuming collection and this figure was reproduced by Hanley and Theobald (1876, Pl. 142, Fig. 1). Layard allowed Cuming to take a number of shells from his collection (Layard, 1895), so it is also possible that this shell originated from him.

Leptopoma (*Trocholeptopoma*) *aspirans* Benson, 1856

Leptopoma aspirans Benson, 1856e: 229; Theobald, 1857: 247; Pfeiffer, 1858: 72; Reeve, 1862 [in 1859–1862], 13 (*Leptopoma*): pl. 4, species 18; Hanley and Theobald, 1870 [in 1870–1876]: 3, Pl. 6, Fig. 4; Nevill, 1878: 280
Leptopoma (*Trocholeptopoma*) *aspirans* Benson; Kobelt and Möllendorff, 1897: 80; Kobelt, 1902: 19; Gude, 1921: 3; Ramakrishna et al., 2010: 41
Type material UMZC I.102910.A, **Fig. 23 D** (one of three syntypes from the R. McAndrew collection labelled "*Leptopoma Aspirans* Bens., Bens. col., Ind." (**Fig. 23 E**); "Tenasserim" has been added later); UMZC I.102915 (two syntypes from the R. McAndrew collection labelled "*Leptopoma Aspirans* Bens., Bens. col., Ind."); UMZC I.104075 (three syntypes from the R. McAndrew collection labelled "*Leptopoma Aspirans* Var., Bens., Bens. col., Ind."); UMZC I.104060 (three syntypes from the R. McAndrew collection labelled "*aspirans*, Bens. col.", no locality data)
Original measurements: "Diam. major 11, minor 9, alt. 12 mill., apert. 6½ mill. longa."
Other material NHMUK 1888.12.4.858, **Fig. 23 F** (one of five shells from the W. Theobald collection labelled "*Leptopoma aspirans* Benson, Tenasserim, Pegu, Arakan")
Type locality Burma: "Hab. in valle Tenasserim" [lives in the Tenasserim Valley]
Remarks The type series, provided by William Theobald, consisted of at least four specimens, as Benson (1856e: 229) noted that "The smaller specimens have a more conical and trochiform appearance than the larger ones". *Leptopoma aspirans* has also been recorded from Peninsular Malaysia and Thailand (Maassen, 2001).

Genus *Leptopomoides* G. Nevill, 1878

Leptopomoides halophilus (Benson, 1851)

Cyclostoma halophilum Benson, 1851a: 265; Pfeiffer, 1853 [in 1843–1854], 1(19), 241: pl. 31, figs 29–31
Leptopoma halophilum (Benson); Reeve, 1862 [in 1859–1862], 13 (*Leptopoma*): pl. 8, species 49; Hanley and Theobald, 1870 [in 1870–1876]: 3, Pl. 6, Fig. 3
Cyclophorus (*Leptopomoides* ?) *halophilum* (Benson); Nevill, 1878: 273
Leptopomatoides halophilus (Benson); Kobelt and Möllendorff, 1897: 86
Leptopomoides halophilus (Benson); Kobelt, 1902: 70, Fig. 14; Gude, 1921: 20
Type material UMZC I.103650.A–H, **Fig. 24 E** (one of eight syntypes, some with opercula *in situ*, from the R. McAndrew collection labelled "*C. Halophilus* Bens., Bens col., Ceylon")
Original measurements: "Diam. major 5, minor 4½, axis 4¼ mill."
Other material UMZC I.103651.A, **Fig. 24 F** (two shells from the R. McAndrew collection labelled "*Cyclophorus Halophilus* Bens., Bens. col., Ceylon"; these specimens are larger than the measurements given in Benson's description); UMZC I.103652 (two shells from the R. McAndrew collection labelled "*Leptopoma Halophilum* Benson, Ind.", no collection data)
Type locality Sri Lanka: "Hab. ad Point de Galle, Ceylon" [lives at Point de Galle, Ceylon]
Remarks Benson based his original description on more than one specimen: "This pretty and distinct little species I found creeping among the grass, and on the inner foot of the sea-wall of the Fort at Point de Galle, in April 1847." This species is considered endemic to Sri Lanka but the locality data on the label accompanying UMZC I.103652 has been degraded to "Ind.". *Leptopomoides halophilus* has recently been reported from the Maldives, where it appears to be an introduction (Gittenberger et al., 2019a). *Cyclostoma*

halophilum is the type of *Leptopomoides* G. Nevill, 1878 by subsequent designation (Wenz, 1923 [in 1923–1930]: 1737).

Leptopomoides orophilum (Benson, 1853)

Cyclostoma orophilum Benson, 1853b: 106
Leptopoma orophilum (Benson); Pfeiffer, 1854a: 87; 1858: 77; Reeve, 1862 [in 1859–1862], 13 (*Leptopoma*): pl. 8, species 51; Hanley and Theobald, 1876 [in 1870–1876]: 56, Pl. 142, Fig. 4
Cyclophorus (*Leptopomoides*) *orophilum* (Benson); Nevill, 1878: 274
Leptopomatoides orophilus (Benson); Kobelt and Möllendorff, 1897: 86
Leptopomoides orophilus (Benson); Kobelt, 1902: 70; Gude, 1921: 20
Type material a neotype (NHMUK 1850.5.8.6, **Fig. 24 D**, one of four shells presented by E.L. Layard with several labels: "*Cyclostoma ceyloniensis* Layard", *Cyclostoma orophilum* Benson, "Ceylon", "Layard Esq. [with the letters 'Fk' rather clumsily added later], "base of Monahagalla mountain" [this last label was reused, and has pencilled notes and 'E.L. Layard' written on it and crossed out]) is here designated with the express purpose of clarifying the taxonomic status of *C. orophilum* (see below)
Original measurements: "Diam. major 9, minor 7, alt. 7½ mill."
Type locality Sri Lanka: "Hab. ad Monahagalla vicum montanum interiorem Insulae Ceylon. Teste Edgar L. Layard" [lives at Monahagalla village, in the mountainous interior of the Island of Ceylon, according to Edgar L. Layard]
Remarks The number of specimens provided by Edgar Layard was not noted in Benson's original description, which also did not mention the operculum. No specimens from the Benson collection are known to survive.

Genus *Micraulax* Theobald, 1876

Micraulax coeloconus (Benson, 1851)

Cyclostoma coeloconus Benson, 1851e: 189; Pfeiffer, 1854 [in 1843–1854], 1(19), 384: pl. 50, figs 9–10
Cyclophorus coeloconus (Benson); Pfeiffer, 1858: 59; Reeve, 1861 [in 1859–1862], 13 (*Cyclophorus*): pl. 18, species 89; Hanley and Theobald, 1870 [in 1870–1876]: 2, Pl. 4, Fig. 5
Cyclophorus (*Micraulax*) *coeloconus* (Benson); Nevill, 1878: 273
Micraulax coeloconus (Benson); Kobelt and Möllendorff, 1897: 86; Kobelt, 1902: 71, Fig. 15; Gude, 1921: 22; Ramakrishna et al., 2010: 42; Raheem et al., 2014: 37–38, figs 19F and 20A
Type material UMZC I.103655.A, **Fig. 26 A** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 37–38) from the McAndrew collection labelled "*Cyclophorus coeloconus* Bens, Bens. col., Trichoor, Ind."); UMZC I.103655B, **Fig. 26 B** (one of six paralectotypes from the same lot); NHMUK 1906.4.4.99 (six paralectotypes from the W.T. Blanford collection labelled "*C.* (*Micraulax*) *coeloconus* Bs. Var., Culeygoody, N. of Trichinopoly, from Benson's collection")
Original measurements: "Diam. major 13, minor 11, axis 9 mill."
Type locality India: "Hab. ad. radices montium Nilgherries Indiae Orientalis. Teste Jerdon" [lives on the lower slopes of the Nilgiri Hills, Eastern India according to Jerdon]
Remarks The number of specimens provided by Thomas Jerdon was not mentioned in Benson's original description. The original locality is sufficiently vague to accept that the Benson specimens from "Trichoor" (Trichur, present-day Thrissur in Kerala), which is close to the foothills of the Nilgiri (and Anaimalai) hills, are part of the type series (Raheem et al., 2014). The specimen figured by Pfeiffer (1854) [in 1843–1854] was also from Benson's collection. This species is endemic to the Western Ghats and Sri Lanka.

Genus *Scabrina* W.T. Blanford, 1863 [4]

Scabrina calyx (Benson, 1856)

Cyclophorus calyx Benson, 1856e: 228; Theobald, 1857: 247; Pfeiffer, 1858: 56; Pfeiffer, 1860 [in 1854–1869], 2, 145: pl. 37, figs 25–27; Reeve, 1861 [in 1851–1854], 13 (*Cyclophorus*): pl. 20, species 104; Hanley and Theobald, 1870 [in 1870–1876]: 2, Pl. 4, Fig. 4
Cyclophorus (*Scabrina*) *calyx* Benson; Blanford, 1863a: 322; Nevill, 1878: 278
Cyclostoma (*Myxostoma*) *calyx* (Benson); Stoliczka, 1871: 148
Scabrina calyx (Benson); Kobelt and Möllendorff, 1897: 88; Kobelt, 1902: 87; Gude, 1921: 28, Fig. 9
Type material UMZC I.102650.A, **Fig. 25 A** (one of three syntypes from the R. McAndrew collection labelled "*Cyclophorus Calyx* Bens., Bens. col., Burmah"); UMZC I.102655 (three syntypes from the R. McAndrew collection labelled "*Cyclophorus Calyx* Var Bens., Bens. col., Moulmein"); BRSMG Aa.618/O.C.2497 (four shells presented by W. Theobald labelled "*Cyclophorus calyx* Benson, Maulmein, W. Theobald Esq.")
Original measurements: "Diam. major 10, minor 8, axis 3 mill."

Other material NHMUK 1954.6.2.1542, **Fig. 25 B** (one of three shells from the J.S. Hawkins collection labelled "*Cyclophorus calyx* Benson, Akouktong, Burma, Paratypes", accompanied by a label in Robert Gordon's handwriting that reads "10, *Cyclophorus calyx* Bens.")

Type locality Burma: "Hab. ad Akaouktong, prope ripas fluminis Irawadi" [lives at Akaouktong, near the banks of the Irawadi River]

Remarks The number of specimens provided by William Theobald was not noted in Benson's original description, which did not include the operculum. Blanford (1863a: 322) later stated that Benson's description "must have been taken from a dead specimen which had lost both its epidermis and operculum." He also thought that Benson's given type locality was a mistake, because he found this species commonly around Moulmein but repeatedly failed to find it in the Akoutong Hills (Blanford, 1865: 97). This observation was reiterated by Stoliczka (1871). The specimens from the J.S. Hawkins collection (NHMUK 1954.6.2.1542–1544) were sent to him by Robert Gordon and correspond with a manuscript list of material from Moulmein (MSS_ZOO_HAW), although the label appears to be based on Benson's published type locality.

Scabrina phaenotopica (Benson, 1851)

Cyclostoma phaenotopicum Benson, 1851e: 190; Pfeiffer, 1854 [in 1843–1854], 1(19), 386: pl. 50, figs 20–21

Cyclophorus phaenotopicus (Benson); Pfeiffer, 1852: 100; Pfeiffer, 1858: 54; Benson, 1854b: 415; Reeve, 1861 [in 1859–1862], 13 (*Cyclophorus*): pl. 18, species 91; Hanley and Theobald, 1870 [in 1870–1876]: 2, Pl. 4, Fig. 3

Cyclophorus (*Theobaldius*) *phaenotopicus* (Benson); Nevill, 1878: 277

Theobaldius phaenotopicus (Benson); Kobelt and Möllendorff, 1897; 105; Kobelt, 1902: 95; Gude, 1921: 40; Ramakrishna et al., 2010: 45

Scabrina phaenotopicus (Benson); Budha et al., 2015: 4

Type material UMZC I.103715.A, **Fig. 25 C** (one of two juvenile syntypes from the R. McAndrew collection labelled "*Cyclophorus Phaenotopicus* Bens., Bens. col., Darjeerling")

Original measurements: "Diam. major 12, minor 10, alt. 4 mill."

Other material UMZC I.103715.C, **Fig. 25 D** (adult shell from the same lot as the type series matching the measurements for the Darjiling specimen mentioned in Benson 1852c); UMZC I.103715.D (smaller adult shell from the same lot as the type series)

Type locality India: "Hab. ad Darjiling, Himalayae Sikkimensis" [lives at Darjiling, Sikkim Himalaya]

Remarks Benson's type series consisted of two juvenile shells: "Although the larger of my two specimens [**Fig. 25 C**] does not bear the signs of age, yet, even if the peristome should be found to acquire a further development, the peculiar dull and sharp scabrous sculpture, as well as the narrower umbilicus, will serve to prevent the species from being confounded with any allied form..." (Benson, 1851e: 190). Benson (1852c: 271) subsequently provided an extended diagnosis based on the acquisition of "an adult specimen from Darjiling" collected by Robert Trotter (with measurements of "Diam. major 13, minor 10, axis 5½ mill.") which can be identified as UMZC I.103715.C (**Fig. 25 D**). Benson's species name is the Hellenized form of "Darjiling", which was not part of British India at the time of description. In addition to the various Indian localities listed above, this species is now also known from several localities in Nepal (Raheem et al., 2010; Budha et al., 2015).

Scabrina pinnulifer (Benson, 1857)

Cyclophorus pinnulifer Benson, 1857b: 205; Pfeiffer, 1860 [in 1854–1869], 2, 145: pl. 37, figs 22–24; Reeve, 1861 [in 1859–1862], 13 (*Cyclophorus*): pl. 20, species 103; Hanley and Theobald, 1870 [in 1870–1876]: 2, Pl. 4, Fig. 2

Cyclophorus (*Myxostoma*) *pinnulifer* Benson; Pfeiffer, 1858: 41

Cyclophorus (*Scabrina*) *pinnulifer* (Benson); Nevill, 1878: 277

Scabrina pinnulifera (Benson); Kobelt and Möllendorff, 1897: 88; Kobelt, 1902: 90; Gude, 1921: 30; Ramakrishna et al., 2010: 43

Type material UMZC I.102590.A, **Fig. 25 E** (holotype from the McAndrew collection labelled "*Cyclophorus Pinnulifer* Bens., Bens. col., Teria Ghat")

Original measurements: "Diam. major 13, minor 10, axis 3¼ mill."

Other material UMZC I.102590.B, **Fig. 25 F** (single shell with operculum from the same lot as the holotype); EXEMS: 1720/1909/D41/286/1–3 (three shells from the J.E. Linter collection labelled "*C. pinnulifer* Ben., Khasi Hills, W.T." [William Theobald])

Type locality India: "Hab. ad Teria Ghat, non raro occurrens. Teste W. Theobald" [lives at Teria Ghat, not uncommon according to W. Theobald]

Remarks Benson based his description on a single specimen provided by William Theobald, which lacked an operculum. We illustrate both of the UMZC specimens from Benson's collection. UMZC I.102590.A, which lacks an operculum and matches

Benson's dimensions, is accepted as the holotype. *Cyclophorus pinnulifer* was fixed as the type species of *Scabrina* W.T. Blanford, 1863 by Nevill (1878: 277). Ramakrishna et al. (2010) recorded this species from Assam, Meghalaya and Nagaland.

Genus *Theobaldius* G. Nevill, 1878

Theobaldius cadiscus (Benson, 1860)

Cyclophorus cadiscus Benson, 1860b: 385; Hanley and Theobald, 1874 [in 1870–1876], 43, Pl. 105, Fig. 10
Theobaldius cadiscus (Benson); Kobelt and Möllendorff, 1897: 88; Kobelt, 1902: 92; Gude, 1921: 33
Type material not located
Original measurements: "Diam. major 17, minor 15, axis 8 mill."
Other material NHMUK 1906.4.4.94, **Fig. 26 E** (one of three shells from the W.T. Blanford collection labelled "*C.* (*Theobaldius*) *cadiscus* Bs., Ceylon")
Type locality Sri Lanka: "Habitat raro in pago Matelle orientali" [lives rarely in the eastern Matelle district]
Remarks The number of specimens provided by Frederick Layard was not noted in Benson's original description. No specimens from either the Benson or Layard collections could be located. We illustrate a specimen labelled *cadiscus* from the W.T. Blanford collection, although there are several Sri Lankan species of *Theobaldius* with very similar shells and in the absence of a type specimen it is difficult to be certain about its true identity.

Theobaldius cratera (Benson, 1856)

Cyclophorus cratera Benson, 1856d: 94; Pfeiffer, 1858: 55; Hanley and Theobald, 1872 [in 1870–1876]: 22, Pl. 47, Fig. 8
Theobaldius cratera (Benson); Kobelt and Möllendorff, 1897: 88; Kobelt, 1902: 92; Gude, 1921: 33
Type material NHMUK 1912.8.16.319–20, **Figs 26 C** (one of two syntypes from the E.L. Layard collection labelled "*Cyclophorus cratera* Bens., Ceylon"); NHMUK 1954.6.2.1531, **Fig. 26 D** (syntype from the J.S. Hawkins collection labelled "*Cyclophorus cratera* Bens, Matelle, Ceylon, F. Layard Esq", accompanied by a scrap of newspaper on which is written, possibly by Layard "*Cyclophorus cratera* Matelli Dist.")
Original measurements: "Diam. major 24, minor 20, alt 8; Diam. major 22, minor 18, alt. 6; Diam. major 13, minor 11, alt. 4" [mill.]
Other material UMZC I.103065.A–B (two shells, one with operculum, from the R. McAndrew collection labelled '*Cyclophorus cratera* Bens., Bens. col., Ceylon); UMZC I.103067 (single shell with operculum from the R. McAndrew collection labelled "*Cyclophorus cratera* var Benson, Ceylon")
Type locality Sri Lanka: "Hab. in Insula Ceylon" [lives on the Island of Ceylon]
Remarks Benson based his description on six specimens: "There are five good specimens in the cabinet of Mr. Edgar Layard, of which the largest only has irregular streaks on the upper side. I find a single dead and bleached specimen among some Cingalese shells received from Mr. Frederick Layard". He provided the measurements of three specimens to demonstrate the variation in size. The two shells from Edgar Layard's collection are associated with labels written by him (see Gude, 1914a: 293). The larger shell (NHMUK 1912.8.16.319) agrees with the largest set of measurements given by Benson. NHMUK 1954.6.2.1531 was given to J.S. Hawkins by Frederick Layard and appears to be the bleached shell mentioned by Benson. The two juvenile shells in lot UMZC I.103065 are not *Theobaldius* because, whorl-for-whorl, they are larger and the single operculum is thick, stratified and calcareous. UMZC I.103067 is not labelled as coming from the Benson collection, although this is likely.

Theobaldius cytopoma (Benson, 1860)

Cyclophorus cytopoma Benson, 1860b: 385; Hanley and Theobald, 1872 [in 1870–1876]: 22, Pl. 47, Fig. 9
Theobaldius cytopoma (Benson); Kobelt and Möllendorff, 1897: 88; Kobelt, 1902: 92; Gude, 1921: 34
Type material UMZC I.103280, **Fig. 26 F** (syntype from the McAndrew collection labelled "*Cyclophorus Cytopoma* Bens., Bens. col., Ceylon")
Original measurements: "Diam. major 24½, minor 19, axis 8 mill."
Type locality Sri Lanka: "Habitat in Insula Ceylon" [lives on the Island of Ceylon]
Remarks The number of specimens provided by Frederick Layard was not noted in Benson's original description. UMZC I.103280 closely matches the dimensions given by Benson. A footnote in *Conchologia Indica* implies that there was only one specimen and adds the following observations of Hanley's: "Having washed the type, the band alluded to by Benson proved to be mere dirt, and in place of paler flames near the apex there were red wavy lines on a paler ground" (Hanley and Theobald, 1872: xv).

Theobaldius parapsis (Benson, 1853)

Cyclophorus parapsis Benson, 1853c: 96; Pfeiffer, 1854a: 87; 1858: 66; Reeve 1861 [in 1859–1862], 13 (*Cyclophorus*): pl. 18, species 90; Hanley and Theobald, 1876 [in 1870–1876]: xv

Cyclophorus (*Theobaldius*) *parapsis* (Benson); Nevill, 1878: 277
Theobaldius parapsis (Benson); Kobelt and Möllendorff, 1897: 105; Kobelt, 1902: 94; Gude, 1921: 39
Type material UMZC I.103980.A–B, **Figs 27 A–B** (two syntypes from the R. McAndrew collection labelled "*Cyclophorus Parapsis* Bens., Bens. col., Ind.")
Original measurements: "Diam. major 13, minor 10, alt. 5 mill."
Other material NHMUK 1912.8.16.313–315 and NHMUK 1912.8.16.323–325 (six shells from the collection of E.L. Layard labelled "*Cyclophorus parapsis* Bens, Damboul, Ceylon, typical"; see Gude, 1914a: 293); NHMUK 20190427 (six shells from the B.R. Lucas collection labelled "*Cyclostoma parapsis* Bens., Ceylon, Layard")
Type locality Sri Lanka: "Hab. ad Damboul, ad verticem rupis, in rimis saxorum" [lives at Damboul, at the top of the cliff, in the cracks of rocks]
Remarks The number of specimens provided by Edgar Layard was not noted in Benson's original description. The larger UMZC shell broadly agrees with the dimensions given by Benson. This species is a Sri Lankan endemic but the locality data that accompanies the UMZC specimens has been degraded to "Ind.".

Theobaldius parma (Benson, 1856)

Cyclophorus parma Benson, 1856d: 94; Pfeiffer, 1858: 55; Hanley and Theobald, 1872 [in 1870–1876]: 57, Pl. 143, Figs 2, 3
Theobaldius parma (Benson); Kobelt and Möllendorff, 1897: 105; Kobelt, 1902: 94; Gude, 1921: 39
Type material NHMUK 1912.8.16.321–322, **Fig. 27 C** (one of two syntypes from the collection of E.L. Layard labelled "*Cyclophorus parma* B., Pallabadula, Ceylon, Types")
Original measurements: "Diam. major 26, minor 23, alt. 6 mill."
Type locality Sri Lanka: "Hab. in regione montana Insulae Ceylon. Mus. E.L. Layard" [lives in the mountainous region of the Island of Ceylon. In the collection of E.L. Layard]
Remarks Benson based his original description on two specimens "in the cabinet of Mr. Edgar Layard". We therefore regard NHMUK 1912.8.16.321–322 as the type series.

Theobaldius ravidus (Benson, 1851)

Cyclostoma ravidum Benson, 1851e: 190; Pfeiffer, 1854 [in 1843–1854], 1(19), 385: pl. 50, figs 14–16; *Cyclophorus ravidus* (Benson); Pfeiffer, 1852: 99; Benson, 1854b: 415; Pfeiffer, 1858: 67; Reeve, 1861 [1859–1862], 13 (*Cyclophorus*): pl. 20, species 102; Blanford and Blanford, 1861: 364; Hanley and Theobald, 1874 [in 1870–1876]: 42, Pl. 105, Figs 5, 6
Cyclophorus (*Theobaldius*) *ravidus* (Benson); Nevill, 1878: 276
Theobaldius ravidus (Benson); Kobelt and Möllendorff, 1897: 105; Kobelt, 1902: 95; Gude, 1921: 41, Fig. 10; Ramakrishna et al., 2010: 45; Raheem et al., 2010: 40–41, Fig. 22D
Type material UMZC I.103670, **Fig. 27 D** (holotype from the R. McAndrew collection labelled "*Cyclophorus Ravidus* Bens., Nilgherries")
Original measurements: "Diam. major 15, minor 13, axis 7 mill."
Type locality India: "Hab. ad apices montium Nilgherries Indiae Meridionalis. Teste Jerdon" [lives on the peaks of the Nilgiri Hills, southern India according to Jerdon]
Remarks Benson based his original description on a single specimen provided by Thomas Jerdon: "The peristome is not quite perfect in the only specimen received by me from Dr. Jerdon". Blanford (1861) noted that specimens from the Anamullay Hills and the Wynaad were considerably larger than Benson's type and thought both forms were conspecific with *C. annulatus* from Ceylon. Nevill (1878: 276), however, regarded Blanford's specimens as varieties of the type. UMZC.I103670 matches Benson's description and dimensions and closely resembles the figure of Benson's type in Reeve (1861, *Cyclophorus* pl. 20, species 102). Kasinathan and Natarajan (1975) included material identified as *Theobaldius ravidus* in their studies of chromosome numbers in selected species of Cyclophoridae. *T. ravidus* is probably endemic to the Western Ghats (Raheem et al., 2014: 40).

Tribe CYATHOPOMATINI

Genus *Cyathopoma* W.T. Blanford & H.F. Blanford, 1861

Cyathopoma filocinctum (Benson, 1851)

Cyclostoma filocinctum Benson, 1851e: 188; Pfeiffer, 1854 [in 1843–1854], 1(19), 379: pl. 49, figs 26–28
Cyclotus filocinctus (Benson); Benson, 1854b: 416; Pfeiffer, 1858: 25; Reeve 1863 [in 1862–1864], 14 (*Cyclotus*): pl. 9, species 50
Cyathopoma filocinctum (Benson); Blanford, 1864: 449; Hanley and Theobald, 1874 [in 1870–1876]: 35, Pl. 82, Figs 2, 3; Nevill, 1878: 258
Cyathopoma (*Cyathopoma*) *filocinctum* (Benson); Kobelt and Möllendorff, 1899: 136; Kobelt, 1902: 221;

Gude, 1921: 135, Fig. 41; Ramakrishna et al., 2010: 32; Raheem et al., 2014: 28–29, Figs 11E–F
Type material UMZC I.103705.A, **Fig. 27 E** (lectotype selected by Raheem and Naggs (Raheem et al., 2014: 28–29, Fig. 11E) from the R. McAndrew collection labelled "*Cyathopoma Filocinctum* Bens., Bens. col.", no locality data); UMZC I.103705.B, **Fig. 27 F** (one of two paralectotypes from the same lot); UMZC I.103665 (three paralectotypes from the R. McAndrew collection labelled "*Cyclotus Filocinctus* Bens., Bens. col., Nilgherries")
Original measurements: "Diam. maj. 3, minor 2½, alt. 2½ mill."
Type locality India: "Hab. ad apices montium Nilgherries. Teste Jerdon" [lives on the peaks of the Nilgiri Hills according to Jerdon]
Remarks The number of specimens provided by Thomas Jerdon was not noted in Benson's original description. This species, which is the type of *Cyathopoma* W.T. Blanford & H.F. Blanford, 1861 by subsequent designation (Gude, 1921: 130), is endemic to the Western Ghats (Raheem et al., 2014).

Genus *Jerdonia* W.T. Blanford & H.F. Blanford, 1861

Jerdonia tignarium Benson, 1863

Cyathopoma (?) *tignarium* Benson, 1863c: 426; Blanford, 1868, 16: 263, pl. 12, Fig. 9; Hanley and Theobald, 1874 [in 1870–1876]: 35, Pl. 82, Figs 7, 10
Cyclotus tignarius (Benson); Pfeiffer, 1865: 33
Lagocheilus tignarius (Benson); Godwin-Austen, 1895a: 453
Cyathopoma (*Jerdonia*) *tignarium* Benson; Kobelt and Möllendorff, 1897: 120; Kobelt, 1902: 227; Gude, 1921: 151; Ramakrishna et al., 2010: 36
Type material UMZC I.103390, **Fig. 28 C** (holotype from the R. McAndrew collection labelled "*Cyathopoma tignarium* Bens., Bens. col., Andaman I.")
Original measurements: "Diam. 2, alt. 2½ mill."
Type locality Andaman Islands: "Habitat in insulis Andamanicus" [lives on the Andaman Islands]
Remarks Benson based his description on one shell: "A single specimen, forwarded by Mr. W. Theobald, is deficient in the double peristome ..."

Jerdonia trochlea (Benson, 1851)

Cyclostoma trochlea Benson, 1851e: 189; Pfeiffer, 1854 [in 1843–1854], 1(19): 380, pl. 49, figs 29–30
Cyclostomus trochlea (Benson); Pfeiffer, 1852: 205; Pfeiffer, 1858: 116
Cyclophorus (*Jerdonia*) *trochlea* (Benson); Blanford and Blanford, 1861: 351; Blanford, 1864: 448
Jerdonia trochlea (Benson); Hanley and Theobald, 1875 [in 1870–1876]: 54, Pl. 135, Figs 5, 6
Cyathopoma trochleum (Benson); Kobelt and Möllendorff, 1897: 120
Cyathopoma (*Jerdonia*) *trochlea* (Benson); Nevill, 1878: 259; Kobelt, 1902: 227; Gude, 1921: 152; Ramakrishna et al., 2010: 36
Cyathopoma trochlea (Benson); Raheem et al., 2014: 33, Figs 15B–C
Type material NHMUK 20110228/1, **Fig. 28 A** (neotype designated by Raheem and Naggs (Raheem et al., 2014: 33, Fig. 15B) from the H.F. Blanford collection labelled "*Jerdonia trochlea* Bens, Pykara, Nilgiris")
Original measurements: "Diam. 2, long. 3 mill."
Other material NHMUK 20110228/2, **Fig. 28 B** (second shell from the neotype lot)
Original type locality India: "Hab. rarum in montibus Nilgherries. Teste Jerdon" [lives rarely in the Nilgiri Hills, according to Jerdon]
Neotype locality India: "Pykara, Nilgiris"
Remarks Since no authentic Benson specimens could be traced, a neotype was designated by Raheem and Naggs (Raheem et al., 2014: 33, Fig. 15B). This is the type species of *Jerdonia* W.T. Blanford & H.F. Blanford, 1861 by subsequent designation (Gude, 1921: 144). This species is endemic to the Western Ghats (Raheem et al., 2014).

Tribe CYCLOTINI

Genus *Cyclotus* Swainson, 1840

Subgenus *Siphonocyclus* Möllendorff, 1900

Cyclotus (*Siphonocyclus*) *gordoni* (Benson, 1863)

Opisthoporus gordoni Benson, 1863b: 322; Pfeiffer, 1865: 36; Kobelt and Möllendorff, 1897: 118
Spiraculum gordoni (Benson); Blanford, 1864: 451
Pterocylos (*Spiraculum*) *gordoni* (Benson); Hanley and Theobald, 1872 [in 1870–1876]: 23, Pl. 49, Figs 9, 10
Pterocyclus (*Spiraculum*) *gordoni* (Benson); Nevill, 1878: 264
Cyclotus (*Siphonocyclus*) *gordoni* (Benson); Kobelt, 1902: 209, Fig. 43; Gude, 1921: 130
Type material not located
Original measurements: "Diam. major 22–23, minor 17–19, axis 5–6 mill."
Type locality Burma: "Habitat non procul ab urbe Moulmein. Invenit Col. R. Gordon" [lives not far from the town of Moulmein. Found by Col. R. Gordon]
Remarks Benson based his description on two shells provided by Col. Robert Gordon: "Two specimens were found on the banks of the Attaran River, near limestone rocks, fifteen miles from its mouth. In one

shell the sutural spiracle is worn down to the surface. The operculum was not obtained." Wenz (1938) erroneously stated that *Opisthoporus gordoni* was the type species of *Siphonocyclus* Möllendorff, 1900, rather than *Pterocyclos tener* Menke, 1856.

Tribe PTEROCYCLINI

Genus *Pterocyclos* Benson, 1832 [5]

Pterocyclos bilabiatus Benson, 1835

Pterocyclos bilabiatus Benson, 1835d: 462; Benson, 1836a: 358; Pfeiffer, 1846 [in 1843–1854], 1(19), 193: pl. 24, figs 11–14; 1858: 30; Reeve, 1863 [in 1862–1864], 14 (*Pterocyclos*): pl. 3, species 13; Hanley and Theobald, 1870 [in 1870–1876]: 3, Pl. 5, Fig. 2; Raheem et al., 2014: 41, Fig. 23B–C

Cyclostoma bilabiatum Sowerby, 1843: 110, pl. 25, figs 81, 82

Pterocyclus bilabiatus (Sowerby); Nevill, 1878: 262; Kobelt and Möllendorff, 1897: 113; Kobelt, 1902: 163; Gude, 1921: 100; Ramakrishna et al., 2010: 76

Type material NHMUK 20110219/1, **Fig. 28 F** (syntype from the Cuming collection labelled *Pterocyclos bilabiatus*, Salem, near Madras, India, M.C." [Museum Cuming])

Original measurements: none given

Other material NHMUK 20110219/2–3 (two shells from the same lot)

Type locality India: "Mr. Sowerby's specimens were from Salem in Madras Presidency; mine were met with at Sicrigully, a pass between the hills and the River Ganges, in Bahár"

Remarks The number of specimens examined was not noted in Benson's (1835d) brief description, but he later mentioned that he had examined Sowerby's specimens in London (Benson, 1836a: 358), presumably during his visit in July 1832. The specimen figured by Sowerby (1843: 110, pl. 25, figs 81–82) is considered to be a syntype because Benson cited material from Sowerby in his 1835 description (cf. Raheem et al., 2014: 41), and the specimen we illustrate is from the locality where Sowerby obtained his specimens. The authorship of this species is problematic and has been discussed in detail by Petit (2009: 194). This species is endemic to the Western Ghats, where it has been identified from the Nilgiri Hills (Coonoor Pass), Kalrayan, Kollimalai and Pachamalai, as well as Salem (Raheem et al., 2014).

Pterocyclos blandi Benson, 1851

Pterocyclos blandi Benson, 1851d: 196, pl. v, Fig. 1; Pfeiffer, 1858: 32; Reeve, 1863 [in 1862–1864], 14 (*Pterocylos*): pl. 2, species 7; Kobelt, 1902: 163

Type material not located

Original measurements: "Diam. 1 inch. *Bland*; Diam. major 29, minor 23 mill. ex icone."

Type locality Malaysia: "Hab. ad Pulo Susson insulam prope Pulo Penang jacentem. Teste Bland" [lives on the island of Pulo Susson, near Pulo Penang, according to Bland]

Remarks William Bland provided a description of this species (his "No.1") but did not name it (Bland, 1836: 783). He also provided "two figures of the natural size of the shell", together with another drawing of his "No. 2" species [*Pterocyclos troschelii*] from "Trincomalee" to accompany his article. Bland's illustrations were never engraved for publication, but the originals were forwarded by the secretary of the Asiatic Society to Benson, who used them as the basis for an anonymous note that was appended to the end of Bland's article giving his thoughts on the affinities of the shell (Benson, 1837d). Benson, who had hoped in vain to obtain Bland's shells for examination, was reluctant to describe the species since the only materials at his disposal were his own pencil outlines of Bland's coloured drawings (**Fig. 28 D**), the originals of which he had returned to the Asiatic Society, together with the published description. However, he overcame these objections at the urging of Louis Pfeiffer and provided a formal description with a name some 15 years later (Benson, 1852d: 196). The original specimen collected and illustrated by Bland could not be located. This species is distinctive, differing from all other *Pterocyclos* species by its depressed and thick shell and its transparent periostracum (Sutcharit et al., 2014). *Pterocyclos blandi* appears to have a limited distribution and is possibly endemic to the Langkawi Islands, Perlis, Malaysia, where it seems to be declining due to exploitation of the limestone quarries (Sutcharit et al., 2014). Kasinathan and Natarajan (1975) included material identified as *Pterocyclos blandi* in their studies of chromosome numbers in selected species of Cyclophoridae.

Pterocyclos cetra Benson, 1856

Pterocyclos cetra Benson, 1856e: 228; Theobald, 1857: 246; Pfeiffer, 1858: 32; Pfeiffer, 1860 [in 1854–1869], 1, 125: pl. 35, figs 10–12; Reeve, 1863 [in 1862–1864], 14 (*Pterocyclos*): pl. 3, species 11; Hanley and Theobald, 1875 [in 1870–1876]: 54, Pl. 134, Figs 7, 10

Pterocyclus cetra (Benson); Nevill, 1878: 262; Kobelt and Möllendorff, 1897: 113; Kobelt, 1902: 164; Gude, 1921: 101

Type material UMZC I.102905, **Fig. 29 A** (one of two syntypes from the R. McAndrew collection labelled "*Pterocyclos Cetra* Bens., Bens. col., Moulmein")

Original measurements: "Diam. major 13, minor 10, axis 4 mill."
Type locality Burma: "Hab. ad Moulmein, et in valle Tenasserim satis frequens" [lives at Moulmein, and quite frequently in the Tenasserim Valley]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. Theobald (1857: 246) noted that the species was not common, adding that the locality at which it was collected on the Tenasserim River was "Phaiethán".

Pterocyclos cingalensis Benson, 1853

Pterocyclos cingalensis Benson, 1853b: 105; Pfeiffer, 1854a: 81; 1858: 29; Hanley and Theobald, 1870 [in 1870–1876]: 3, Pl. 5, Fig. 5
Pterocyclus cingalensis (Benson); Nevill, 1878: 261; Kobelt and Möllendorff, 1897: 113; Kobelt, 1902: 164; Gude, 1921: 102
Type material UMZC I.103960.A, **Fig. 28 G** (syntype from the R. McAndrew collection labelled "*Pterocyclos Cingalensis* = (*Cumingii* Pfr) Bens., Bens. col., Ceylon"); UMZC I.103960.B, **Fig. 28 H** (one of two shells complete with opercula from the same lot)
Original measurements: "Diam. major 19½, minor 16, alt. 6 mill."
Other material NHMUK 1853.12.16.7–8 (two shells, one complete with operculum, labelled "*Pterocyclos cingalensis* Benson, Ceylon, E.L. Layard Esq."); NZSI M.16891/2 (two shells labelled "*Pterocyclos cingalensis* Benson, Maskat, Type, very rare")
Type locality Sri Lanka: "ad vicum montanum Monahagalla, Insulae Ceylon. Teste Dom. Edgar Leopold Layard" [lives at the mountain village of Monahagalla, Island of Ceylon, according to Mr. Edgar Leopold Layard]
Remarks The number of specimens provided by Edgar Layard was not noted in Benson's original description. The largest UMZC specimen broadly matches the dimensions given by Benson and lacks an operculum; in his original description, Benson noted "Operculo (teste E.L. Layard) pyramidali" [operculum (according to E.L. Layard) pyramidal], indicating that he had not seen the operculum himself. However, both of the other specimens from the Benson collection possess opercula, suggesting that these might have been acquired later. An operculum also survives with one of the two Layard collection shells (NHMUK 1853.12.16.7–8). Despite being labelled "Type", the specimens in the ZSI are not from the type locality and are therefore not considered to be part of the type series.

Pterocyclos nanus Benson, 1851

Pterocyclos nanus Benson, 1851f: 450; Pfeiffer, 1852: 47; Pfeiffer, 1854 [in 1843–1854], 1(19), 388: pl. 49, figs 31–33; Pfeiffer, 1858: 31; Reeve, 1863 [in 1862–1864], 14 (*Pterocyclos*): pl. 3, species 12; Hanley and Theobald, 1872 [in 1870–1876]: 23, Pl. 49, Figs 5, 6; Raheem et al., 2014: 44, Fig. 24D
Pterocyclus nanus Benson; Nevill, 1878: 262; Kobelt and Möllendorff, 1897: 114 (as *manus*); Kobelt, 1902: 167; Gude, 1921: 107; Ramakrishna et al., 2010: 77
Type material UMZC I.103695, **Fig. 29 B** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 44, Fig. 24D) from the R. McAndrew collection labelled "*Pterocyclus nanus* Bens., Bens. col., Nilgherries")
Original measurements: "Diam. major 10, minor 8, alt. 5 mill."
Other material NHMUK 1906.5.5.15 (two shells from the W.T. Blanford collection labelled "*Pterocyclos nanus* Bs., type, from H. Cuming, Niligiris?")
Type locality India: "Hab. ad basin montium Nilgherries, "Indiae Australis" [lives at the foot of the Nilgiri Hills, Southern India]
Remarks Thomas Jerdon sent a specimen of this species to Benson, who initially overlooked it as a young and imperfect specimen of a larger species. It appears that only one specimen was sent, although this is not completely clear from Benson's account. This species is endemic to the Western Ghats (Raheem et al., 2014).

Pterocyclos pullatus Benson, 1856

Pterocyclos pullatus Benson, 1856e: 227; Theobald, 1857: 246; Pfeiffer, 1858: 31; Pfeiffer, 1860 [in 1854–1869], 1, 124: pl. 34, figs 5–9; Reeve, 1863 [in 1862–1864], 14 (*Pterocyclos*): pl. 3, species 16; Blanford, 1865: 97; Hanley and Theobald, 1875 [in 1870–1876]: 54, Pl. 134, Figs 2–4
Pterocyclus pullatus Benson; Nevill, 1878: 262; Kobelt and Möllendorff, 1897: 114; Kobelt, 1902: 168; Gude, 1921: 109
Type material UMZC I.103050, **Fig. 29 C** (syntype from the R. McAndrew collection, with a circular label in Benson's handwriting that reads "*Pterocyclos pullatus* Bens. and operculum. Akoutong". Another label in unknown handwriting (possibly Hanley's) reads "figured in Conch Indic 134, f 2, 3, 4"); UMZC I.103045 (syntype from the R. McAndrew collection labelled "*Pterocyclos Pullatus* Bens., Bens. col., Ind.")
Original measurements: "Diam. major 13, minor 11½, axis 6 mill."
Type locality Burma: "ad Akaouktong, prope fluvium Irawadi" [lives at Akaouktong, near the Irawadi River]

Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. Theobald (1857: 246) noted that the species was common at the type locality.

Pterocyclos rupestris Benson, 1832

Pterocyclos rupestris Benson, 1832: 13, pl. 2. Fig. 1; Benson, 1836a: 356; Pfeiffer, 1852: 46; Pfeiffer, 1858: 30; Reeve, 1863 [in 1862–1864], 14 (*Pterocyclos*): pl. 2, species 8; Hanley and Theobald, 1870 [in 1870–1876]: 3, Pl. 5, Fig. 8; Sutcharit et al., 2014: 331, Figs 3A–D.
Spiraculum rupestris (Benson); Pearson, 1833a: 592
Pterocyclus rupestris Benson; Nevill, 1878: 260; Kobelt and Möllendorff, 1897: 114; Kobelt, 1902: 169; Gude, 1921: 110; Ramakrishna *et al*., 2010: 78
Material UMZC I.102070.A, **Fig. 29 D** (one of seven shells from the R. McAndrew collection labelled "*Pterocyclos Rupestris* Bens., Bens. col.", no locality data).
Original measurements: none given
Type locality India: "discovered on the 15th and 16th December, 1831, among the jungle-covered rocks of the hill of Partharghâta, one of the western outliers of the Rájmahal range, situated a little below Kalgaon, on the Ganges; and on the eminence of Sikrigali, another outlier of the same range to the north-east."
Remarks Benson based his original description on at least four specimens from two localities, all of which were collected as empty shells (Benson, 1832: 12). Amongst these he identified three un-named varieties that differed slightly from "the type specimen" [i.e. holotype]: "Var. 1. The same [as the holotype] without the medial line, Var. 2. Ditto [i.e. the same as the holotype] without the angular markings underneath, Var. 3. The whole shell horn coloured." (Benson, 1832: 13). Responding to criticism from Pearson (1833a) that he had based his descriptions of both *rupestris* and the genus *Pterocyclos* on immature specimens, Benson later remarked that he had obtained "16 specimens of different ages and growth, of which 12 bore all the marks of being adult", including living examples (Benson, 1836a: 356–357). One of the UMZC specimens (stored in a separate box) has been labelled as "most like the figured type", presumably a reference to the illustration in Reeve (1862–1864), which depicts a Benson collection shell. Another appears to be the "horn coloured" Var. 3. Sutcharit *et al*. (2014) designated a lectotype from lot UMZC I.102070, to which they appended the incorrect registration number UMZC 2359.1. This designation is invalid because a holotype specimen was identified in Benson's original description. However, since the holotype cannot be clearly identified amongst the surviving Benson collection specimens in the UMZC, we have designated UMZC I.102070.A as the neotype. It should also be noted that Benson did not record which of the two localities mentioned in his original description was the source of the holotype, and in the absence of his original documentation this information is now lost. This is the type species of *Pterocyclos* Benson, 1832, which is the type genus of the Pterocyclinae (= Tribe Pterocyclini).

Pterocyclos troscheli Benson, 1851

Pterocyclos troscheli Benson, 1851d: 196, Pl. 5, Fig. 2; Pfeiffer, 1852: 44; Pfeiffer, 1858: 32
Pterocyclus cumingi var. *troscheli* Benson; Nevill, 1878: 261
Pterocyclus troscheli Benson; Kobelt and Möllendorff, 1897: 114; Kobelt, 1902: 170; Gude, 1921: 111
Type material not located
Original measurements: "Diam 7/10 inch. *Bland*.; Diam. major 20, minor 18 mill. ex icone."
Type locality Sri Lanka: "Hab. ad Trincomalee Insulae Ceylon. Teste *Bland*" [lives at Trincomalee, Island of Ceylon, according to Bland]
Remarks William Bland first provided a description of the shell of this species (Bland, 1836) but he did not name it. Benson (1837d) added his initial thoughts on its affinities in a note that followed Bland's article but he did not formally name it until several years later (Benson, 1851d). Benson had never seen a specimen of this species and had to rely on Bland's description and tracings that he had made (**Fig. 28 E**) of Bland's original drawing of a single shell for the formal diagnosis (Benson, 1851d: 196, Pl. 5, Fig. 2). Blanford (1868: 78), cautioning against the practice of describing species in this way, noted that "this species has never again been recognised, though there can be but little doubt that the specimen from which the original drawing was taken, belonged to one of the [Sri Lankan] species since instituted". Bland's original specimen of this Sri Lankan endemic could not be located.

Genus *Rhiostoma* Benson, 1860

Rhiostoma haughtoni Benson, 1860

Accepted as *Rhiostoma housei* (Haines, 1855);
Cyclostoma housei Haines, 1855: 6: 157, pl. 5, figs 12–15

Rhiostoma haughtoni Benson 1860e: 96; Pfeiffer, 1865: 39; Kobelt and Möllendorff, 1897: 115; Kobelt, 1902: 177, Fig. 38; Gude, 1921: 128, Fig. 22
Pterocyclos haughtoni (Benson); Reeve, 1863 [in 1862–1864], 14 (*Pterocyclos*): pl. 5, species 30

Pterocyclos (*Rhiostoma*) *haughtoni* (Benson); Hanley and Theobald, 1870 [in 1870–1876]: 3, Pl. 5, Fig. 10
Pterocyclus (*Rhiostoma*) *haughtoni* (Benson); Nevill, 1878: 262

Type material UMZC I.103445.A, **Fig. 29 E** (one of two syntypes, both complete with opercula, from the R. McAndrew collection labelled "*Rhiostoma Houghtoni* [sic], Bens. col., Moulmein". One of these has been labelled "Lectotype" but this does not appear to have been published. We therefore designate the same shell, UMZC I.103445.A, as the lectotype)
Original measurements: "Diam. major 21, minor 11, axis 8½ mill."

Other material NHMUK 1888.12.4.1985, **Fig. 29 F** (one of two specimens, both complete with opercula, from the W. Theobald collection labelled "*Rhiostoma haughtoni* Benson, Damathat Caves", with a later addition in pencil reading "F.B.I. Fig. 22"); BRSMG Aa.429/O.C.2480 (two shells, one adult and one juvenile, presented by W. Theobald labelled "*Aulopoma haughtoni* Bens, Maulmein")

Type locality Burma: "ad cavernam Damatha, non procul ab urbe Moulmein" [at Damatha Cave, not far from the town of Moulmein]

Remarks Benson (1860e: 96) based this taxon on at least four specimens: "This shell was discovered by Capt. J. C. Haughton, to whom I am indebted for a couple of specimens, one of which was alive. A weathered specimen, from the same source, was previously received from Mr. W. Theobald junr, who has since forwarded the animal in spirits". One of the NHM shells from the Theobald collection is considerably weathered and may therefore be the specimen referred to in Benson's original description, although the weathered adult specimen in BMAG is also a candidate. This species, which is the type species of *Rhiostoma* Benson, 1860, is often regarded as a junior synonym of *Rhiostoma housei* Haines, 1855 (Abbott, 1989: 42). However, *R. housei* ranges from Thailand (type locality) to Indo-China and exhibits significant intra-specific variation in shell morphology across this range. Recent phylogenetic studies have suggested that "*R. housei*" is likely to represent a complex of cryptic species (Prasankok et al., 2011), so Benson's *R. haughtoni* may yet prove to be distinct from *R. housei*. Kasinathan and Natarajan (1975) included material identified as *Rhiostoma housei* from Thailand in their studies of chromosome numbers in selected species of Cyclophoridae.

Family ALYCAEIDAE [6]

Genus *Alycaeus* Gray, 1850

Alycaeus pyramidalis Benson, 1856

Alycaeus pyramidalis Benson, 1856e: 225; Theobald, 1857: 247; Pfeiffer, 1858: 33; Pfeiffer, 1860 [in 1854–1869], 1, 126: pl. 35, figs 13–14; Hanley and Theobald, 1874 [in 1870–1876]: 38, Pl. 91, Figs 5, 6; Reeve and Sowerby, 1877 [in 1875–1878], 20 (*Alycaeus*): Pl. 1, Fig. 6; Nevill, 1878: 293; Godwin-Austen, 1914 [in 1897–1914]: 427, pl. 156, figs 6, 6a; Páll-Gergely et al., 2020a: 33
Alycaeus (*Orthalycaeus*) *pyramidalis* (Benson); Kobelt and Möllendorff, 1897: 150
Alycaeus (*Alycaeus*) *pyramidalis* Benson; Kobelt, 1902: 348; Gude, 1921: 216

Material UMZC I.102830.A, **Fig. 30 A** (one of two shells from the R. McAndrew collection labelled "*Alycaeus Pyramidalis* Bens., Bens. col.", no locality data); NHMUK 1888.12.4.937–8 (two shells from the W. Theobald collection labelled "*Alycaeus pyramidalis* Bens., Tenasserim"); NHMUK 1906.4.4.45 (single shell from the W.T. Blanford collection labelled "*Alycaeus pyramidalis* Bs., Therabuin Hill, Tenasserim")
Original measurements: "Long. 12, axis 10, lat. 10 mill."

Type locality Burma: "ad collem Therabuin, vallis Tenasserim" [at Therabuin Hill, Tenasserim Valley]

Remarks The number of specimens provided by William Theobald was not mentioned in Benson's original description. Benson noted that this species occurred on the steeply scarped and almost inaccessible limestone hill at Therabuin but was not known from any other locality and appeared to be restricted to a spot of a few acres in circumference. Theobald (1857: 247) also reported that the animal "is of a delicate pink tint".

Genus *Chamalycaeus* Kobelt & Möllendorff, 1897

Chamalycaeus andamaniae (Benson, 1861)

Alycaeus andamaniae Benson, 1861c: 28; Pfeiffer, 1865: 47; Hanley and Theobald, 1874 [in 1870–1876]: 38, Pl. 91, Figs 7, 10; Reeve and Sowerby, 1877 [in 1875–1878], 20 (*Alycaeus*): Pl. 2, Fig. 10; Nevill, 1878: 295; Godwin-Austen, 1914 [in 1897–1914]: 430; Rao et al., 2013: 129
Alycaeus (*Chamalycaeus*) *andamaniae* Benson; Kobelt and Möllendorff, 1897: 151; Kobelt, 1902: 352; Gude, 1921: 223
Chamalycaeus (*Chamalycaeus*) *andamaniae* (Benson); Ramakrishna et al., 2010: 52
Chamalycaeus andamaniae (Benson); Páll-Gergely et al., 2020a: 36

Type material UMZC I.103175, **Fig. 32 A** (holotype from the R. McAndrew collection labelled "*Alycaeus Andamaniae* Bens., Andaman Ids")
Original measurements: "Diam. major 5, minor 4, alt. 3 mill."
Type locality Andaman Islands: "Habitat ad Portum Blair Insulae Adamanicae. Collegit Capt. J.C. Haughton" [lives at Port Blair, Andaman Islands. Collected by Capt. J.C. Haughton]
Remarks Benson based his description on a single specimen provided by Haughton. McAndrew's label does not state that this specimen is from the Benson collection, although this must be the case since it is listed as a late entry into his Catalogue and was inserted together with other specimens acquired with the Benson collection. This species is endemic to the Andaman and Nicobar Islands (Rao et al., 2013) and has been widely regarded as the type species of *Chamalycaeus* Kobelt & Möllendorff, 1897. However, Páll-Gergely et al. (2017a) have shown that *Chamalycaeus* was actually mentioned by Möllendorff in an earlier paper in which he described *Alycaeus* (*Chamalycaeus*) *fruhstorferi* (Möllendorff, 1897), making this the type species of *Chamalycaeus* by monotypy (cf. Egorov, 2013; Páll-Gergely et al., 2020a).

Chamalycaeus (?) *armillatus* (Benson, 1856)

Alycaeus armillatus Benson, 1856e: 227; Theobald, 1857: 247; Pfeiffer, 1858: 37; Pfeiffer, 1865: 37; Hanley and Theobald, 1874 [in 1870–1876]: 38, Pl. 93, Fig. 10; Reeve and Sowerby, 1877 [in 1875–1878], 20 (*Alycaeus*): pl. 5, Fig. 38; Nevill, 1878: 293; Godwin-Austen, 1914 [in 1897–1914]: 406, pl. 151, figs 3, 3a
Alycaeus (*Charax*) *armillatus* Benson; Kobelt and Möllendorff, 1897: 152
Alycaeus (*Dicharax*) *armillatus* Benson; Kobelt, 1902: 365; Gude, 1921: 236
Chamalycaeus (?) *armillatus* Benson; Páll-Gergely et al., 2020a
Type material UMZC I.102995, **Fig. 32 B** (holotype from the R. McAndrew collection labelled "*Alycaeus Armillatus* Bens., Bens. col.", no locality data)
Original measurements: "Diam. major 2, minor 1¾, axis 1¼ mill.
Other material EXEMS: 1720/1909/D41/27/1–3 (three shells from the J.E. Linter collection labelled "*A. armillatus* Ben., "India", W.T." [William Theobald])
Type locality Burma: "ad Thyet-Mio cum praecedente" [from Thyet-Mio with the previous species [*Chamalycaeus sculptilis*]]
Remarks Benson (1856e: 227) described a single shell provided by William Theobald: "The only specimen received is in a weathered condition, and so much bleached that the colour of the perfect shell cannot be ascertained". The UMZC shell matches both this description and the measurements provided by Benson and is accepted as the holotype. Páll-Gergely et al. (2020b) tentatively assigned this species to *Chamalycaeus* based on the occurrence of spiral striae on the teleoconch, although the corroded condition of the holotype meant that these were only visible as part of the lower shell layers.

Chamalycaeus sculptilis (Benson, 1856)

Alycaeus sculptilis Benson, 1856e: 226; Theobald, 1857: 247; Pfeiffer, 1858: 35; Blanford, 1864: 458; Blanford, 1865: 98; Hanley and Theobald, 1874 [in 1870–1876]: 39, Pl. 97, Figs 5, 6; Reeve and Sowerby, 1877 [in 1875–1878], 20 (*Alycaeus*): pl. 4, figs 32a–32b; Nevill, 1878: 292; Godwin-Austen, 1914 [in 1897–1914]: 412, Pl. 129, Figs 7, 7a, Pl. 145, Fig. 8
Alycaeus (*Chamalycaeus*) *sculptilis* Benson; Kobelt and Möllendorff, 1897: 152; Kobelt, 1902: 362; Gude, 1921: 233
Chamalycaeus (*Chamalycaeus*) *sculptilis* Benson; Ramakrishna et al., 2010: 55
Type material a neotype (UMZC I.102845.A, **Fig. 32 C)** is here designated from a series of three shells from the R. McAndrew collection labelled "*Alycaeus Sculptilis* Bens., Bens. col., Thyet Myo"). We have designated a neotype with the express purpose of clarifying the taxonomic status of *A. sculptilis* (see below).
Original measurements: "Diam. 3½, axis 2¾ mill."
Other material NHMUK 1888.12.4.867–872 (six shells from Theobald collection labelled "*Alycaeus sculptilis* Benson, Tondoung"); EXEMS: 1720/1909/D41/9/1–7 (seven shells from the J.E. Linter collection labelled "*A. sculptilis* Ben., W.T. [William Theobald]", no locality data); EXEMS: 1720/1909/D41/9/8–16 (nine shells from the J.E. Linter collection labelled "*sculptilis*, W.T. [William Theobald]", no locality data)
Type locality Burma: "raro ad Thyet-Mio prope fluvium Irawadi, non procul a finibus provinciae Burmanicae Britannicae" [rarely at Thyet-Mio near the river Irawadi, not far from the borders of British Burma]
Remarks Benson based his description on a single shell provided by William Theobald: "The specimen is much weathered, and has lost all its colour, so that I am unable to describe that part of its character ..." (Benson, 1856e: 226). Theobald (1857: 247) noted that the species was rare, although numerous specimens survive amongst material from the Theobald collection held by the NHM and the RAMM. The NHM specimens are labelled "Tondoung", which is near Thyet Mio and therefore compatible with the type

locality. Ramakrishna et al. (2010) also recorded this species from India (Meghalaya, Nagaland).

Genus *Dicharax* Kobelt & Möllendorff, 1900

Dicharax gemmula (Benson, 1859)

Alycaeus gemmula Benson, 1859g: 179; Pfeiffer, 1865: 52; Hanley and Theobald, 1874 [in 1870–1876]: 38, Pl. 93, Fig. 7; Reeve and Sowerby, 1877 [in 1875–1878], 20 (*Alycaeus*): pl. 5, Fig. 37; Nevill, 1878: 294; Godwin-Austen, 1886 [in 1882–1888]: 190, pl. 48, figs 4–4c; Godwin-Austen, 1914 [in 1897–1914]: 340, 356
Alycaeus (*Charax*) *gemmula* (Benson); Kobelt and Möllendorff, 1898: 129
Alycaeus (*Dicharax*) *gemmula* Benson; Kobelt, 1902: 370; Gude, 1921: 252
Chamalycaeus (*Dicharax*) *gemmula* (Benson); Ramakrishna et al., 2010: 60
Type material a neotype (NHMUK 1906.4.4.55, **Fig. 31 A)** is here designated from the W.T. Blanford collection labelled "*Alycaeus gemmula*, Rungun Valley, Sikkim". We have designated a neotype with the express purpose of clarifying the taxonomic status of *A. gemmula* (see below).
Original measurements: "Long 2 1/3, diam 1 1/3 mill."
Type locality India: "Habitat rarissime in valle Rungun" [lives very rarely in the Rungun Valley]
Remarks Benson based his original description on a single shell, lacking its operculum, provided by William Blanford. The single shell in the Blanford collection might be the holotype, since there are no specimens in the Benson collection, but there is no clear evidence to support this. We have therefore designated it as the neotype.

Dicharax hebes (Benson, 1857)

Alycaeus hebes Benson 1857b: 204; Pfeiffer, 1858: 37; Pfeiffer, 1860 [in 1854–1869] 1, 129: pl. 35, figs 28–31; Hanley and Theobald, 1874 [in 1870–1876]: 38, Pl. 93, Figs 5, 6; Reeve and Sowerby, 1877 [in 1875–1878], 20 (*Alycaeus*): pl. 7, Fig. 52; Nevill, 1878: 290; Godwin-Austen, 1886 [in 1882–1888]: 191, pl. 43, figs 1–1c; Godwin-Austen, 1914 [in 1897–1914]: 374, pl. 145, figs 5, 5a, 5b
Alycaeus (*Charax*) *hebes* Benson; Benson, 1859g: 177; Kobelt and Möllendorff, 1898: 129
Alycaeus (*Dicharax*) *hebes* Benson; Kobelt, 1902: 371; Gude, 1921: 255
Chamalycaeus (*Dicharax*) *hebes* (Benson); Ramakrishna et al., 2010: 61
Type material a neotype (NHMUK 1888.12.4.908, **Fig. 31 C**) is here designated from a series of three shells in the W. Theobald collection labelled "*Alycaeus hebes* Benson, Khasi Hills". We have designated a neotype with the express purpose of clarifying the taxonomic status of *A. hebes* (see below). A second shell from the same lot (NHMUK 1888.12.4.909) is also figured (**Fig. 31 D**).
Original measurements: "Diam. major 4, minor 3, axis 3 mill."
Other material UMZC I.102635 (single shell from the R. McAndrew collection labelled "*Alycaeus Hebes* Bens., Bens. col.", no locality data); NHMUK 1903.7.1.2658 (17 shells from the Godwin-Austen collection labelled "Teria Ghat, typical")
Type locality India: "Khasi Hills"
Original locality India: "Hab. ad Teria Ghat. Teste W. Theobald" [lives at Teria Ghat according to W. Theobald]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. UMZC I.102635 is labelled as *Alycaeus hebes* but does not match Benson's description and appears to belong to a different species. The Theobald collection specimens (NHMUK 1888.12.4.908–10) are from the type locality (Teria Ghat is in the Khasi Hills). These specimens agree with Benson's description and with the Benson material figured by Pfeiffer (1860 [in 1854–1869], pl. 35, figs 28–31) and we therefore designate one of them as the neotype. Other material from Teria Ghat in the Godwin-Austen collection appears to be identical (Páll-Gergely et al., 2017a, Fig. 5). *Alycaeus hebes* is the type species of *Dicharax* Kobelt & Möllendorf, 1900 (= *Charax* Benson, 1859 non Risso, 1826) by subsequent designation (Gude, 1921: 236).

Dicharax plectocheilus (Benson, 1859)

Alycaeus plectocheilus Benson, 1859g: 180; Pfeiffer, 1865: 53; Hanley and Theobald, 1874 [in 1870–1876]: 39, Pl. 96, Figs 5, 6; Reeve and Sowerby, 1877 [in 1875–1878], 20 (*Alycaeus*): pl. 2, figs 14a, 14b; Nevill, 1878: 294; Godwin-Austen, 1914 [in 1897–1914]: 342, pl. 134, figs 4–4c, 343, pl. 133, figs 3–3c
Alycaeus (*Charax*) *plectochilus* (Benson); Kobelt and Möllendorff, 1898: 129
Alycaeus (*Dicharax*) *plectochilus* (Benson); Kobelt, 1902: 375; Gude, 1921: 264
Chamalycaeus (*Dicharax*) *plectochilus* (Benson); Ramakrishna et al., 2010: 65
Type material UMZC I.102745.A, **Fig. 31 E** (one of two syntypes from the R. McAndrew collection labelled "*Alycaeus Plectocheilus* Bens., Bens col., Darjiling". An additional label reads "Typical, drawn GA [Godwin-Austen]"); NHMUK 1906.4.4.184, **Fig. 31 F** (one of two syntypes from the W.T. Blanford collection, one specimen in a separate tube labelled "*A.*

plectocheilus Bs., Darjiling, Rungnu [sic] Valley, one of the types. Darjiling")
Original measurements: "Diam. major 2½, minor 2, axis vix 2 mill."
Other material NHMUK 1906.4.4.47 (four shells from the W.T. Blanford collection labelled "*Alycaeus plectocheilus* Bs., Rungun Valley, Darjiling". The register entry for this lot also states "one sent to G.-A. to figure")
Type locality India: "Habitat in valle Rungun" [lives in the Rungun Valley]
Remarks Benson's type series included at least four shells collected by William Blanford: "The dimensions given are those of the largest of four specimens" (Benson, 1859g: 180). The "Rungun valley" is most likely to refer to the valley of the Rangnu Khola near Darjeeling, so the locality given for the UMZC specimens is consistent with the type locality. Gude (1921) recorded this species from NE India (West Bengal – Darjeeling, Sikkim-Damsang Peak) and West Bhutan. It is now known from Nepal (Budha et al., 2015). It is not clear whether the label associated with the Cambridge specimens refers to these shells being the ones drawn by Godwin-Austen, or simply that the species was drawn by him; it is more likely that the figured specimen came from NHMUK 1906.4.4.47.

Dicharax umbonalis (Benson, 1856)

Alycaeus umbonalis Benson, 1856e: 225; Theobald, 1857: 247; Pfeiffer, 1858: 36; Pfeiffer, 1860 [in 1854–1869], 1: 127, pl. 35, figs 18–20; Blanford, 1865: 98; Hanley and Theobald, 1874 [in 1870–1876]: 38, Pl. 92, Figs 8, 9; Reeve and Sowerby, 1878 [in 1875–1878], 20 (*Alycaeus*): pl. 4, Fig. 36; Nevill, 1878: 293; Godwin-Austen, 1886 [in 1882–1888]: 194, pl. 44, figs 2–3c; Godwin-Austen, 1914 [in 1897–1914]: 413, 424
Alycaeus (*Chamalycaeus*) *umbonalis* Benson; Kobelt and Möllendorff, 1897: 152; Kobelt, 1902: 364; Gude, 1921: 235
Dicharax umbonalis (Benson); Páll-Gergely et al., 2020a: 106.
Type material UMZC I.103005.A, **Fig. 31 B** (one of three syntypes from the R. McAndrew collection labelled "*Alycaeus Umbonalis* Bens., Bens. col., Burmah"); UMZC I.103000 (syntype from the R. McAndrew collection labelled "*Alycaeus Umbonalis* Var. Bens., Bens. col., Pegu")
Original measurements: "Diam. major 10, minor 8, axis 5 mill."
Other material NHMUK 1888.12.4.892–4 (three shells from the W. Theobald collection labelled "*Alycaeus umbonalis* Benson, Pegu"); NHMUK 1906.4.4.65 (five shells from the W.T. Blanford collection labelled "*Alycaeus umbonalis* Bs., Akouktoung, Pegu", with a note in the register stating "one taken off & figd. by G.A. is 1906.1.1.67". This, however, is a mistake, the corresponding register entry having been left blank. The figured specimen was actually numbered NHMUK 1906.1.1.967 and labelled "*Alycaeus umbonalis* Bs., Akowtong on Irawady, Figd. Moll. Ind. Pl. XLIV, F2")
Type locality Burma: "ad Akaouktong, prope ripas fluvii Irawadi" [At Akaouktong, near the banks of the Irawadi river]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. Theobald (1857: 247) later noted that the species was common.

Genus *Metalycaeus* Pilsbry, 1900

Metalycaeus crenulatus (Benson, 1859) comb. nov.

Alycaeus crenulatus Benson, 1859g: 180; Pfeiffer, 1865: 55; Hanley and Theobald, 1874 [in 1870–1876]: 39, Pl. 97, Figs 1, 4; Reeve and Sowerby, 1877 [in 1875–1878], 20 (*Alycaeus*): pl. 5, Fig. 43; Nevill, 1878: 295; Godwin-Austen, 1914 [in 1897–1914]: 337, pl. 133, figs 1–1c
Alycaeus (*Charax*) *crenulatus* Benson; Kobelt and Möllendorff, 1897: 152
Alycaeus (*Dicharax*) *crenulatus* (Benson); Kobelt, 1902: 367; Gude, 1921: 242
Chamalycaeus (*Dicharax*) *crenulatus* (Benson); Ramakrishna et al., 2010: 57
Type material UMZC I.102690, **Fig. 30 B** (syntype from the R. McAndrew collection labelled "*Alycaeus Crenulatus* Bens., Bens. col., Darjiling")
Original measurements: "Diam. major 4, minor 3 1/3, axis 3 mill."
Other material NHMUK 1906.4.4.46 (five shells from the W.T. Blanford collection labelled "*Alycaeus crenulatus* Bs., Rungun Valley, Darjiling")
Type locality India: "Habitat in valle Rungun" [lives in the Rungun Valley]
Remarks Benson (1859g: 180) based his description on several specimens collected by William Blanford that were "all weathered and bleached"; the NHM specimens match this description but cannot be linked directly to Benson. The "Rungun valley" is most likely to refer to the valley of the Rangnu Khola near Darjeeling, so the locality given for the UMZC specimen is consistent with the type locality. Ramakrishna et al. (2010) also recorded this species from Sikkim.

Metalycaeus physis (Benson, 1859)

Alycaeus physis Benson, 1859g: 179; Pfeiffer, 1865: 48; Hanley and Theobald, 1874 [in 1870–1876]: 38, Pl. 92, Figs 5, 6; Reeve and Sowerby, 1877 [in 1875–

1878], 20 (*Alycaeus*): Pl. 6, Fig. 51; Nevill, 1878: 294; Godwin-Austen, 1914 [in 1897–1914]: 342, Pl. 134, Figs 1, 1a
Alycaeus (*Chamalycaeus*) *physis* Benson; Kobelt and Möllendorff, 1897: 152; Kobelt, 1902: 361; Gude, 1921: 231, Fig. 34
Chamalycaeus (*Chamalycaeus*) *physis* (Benson); Ramakrishna *et al*., 2010: 55
Metalycaeus physis (Benson); Páll-Gergely et al., 2020a: 151
Type material UMZC I.102735, **Fig. 30 C** (syntype from the R. McAndrew collection labelled "*Alycaeus Physis* Var Bens., Bens. col., Sikkim")
Original measurements: "Diam. major 10, minor 8, axis 6 mill."
Other material NHMUK 1906.4.4.64, **Fig. 30 D** (one of six shells from the W.T. Blanford collection labelled "*Alycaeus physis* Bs., Rungeet Valley, Darjiling")
Type locality India: "Habitat in valle Rungit (alt. 2000 ped.), prope Darjiling, raro occurrens" [lives in the Rungit Valley (altitude of 2000 feet), near Darjiling, occurs rarely]
Remarks The number of specimens provided by William Blanford was not noted in Benson's original description.

***Metalycaeus prosectus* (Benson, 1857)** comb. nov.

Alycaeus prosectus Benson, 1857b: 203; Pfeiffer, 1858: 36; Pfeiffer, 1860 [in 1854–1869], 1: 128, pl. 35, figs 21–23; Hanley and Theobald, 1874 [in 1870–1876]: 38, Pl. 92, Figs 2, 3; Reeve and Sowerby, 1877 [in 1875–1878], 20 (*Alycaeus*): pl. 6, species 49; Godwin-Austen, 1914 [in 1897–1914]: 380, pl. 143, figs 1, 1a, 1b
Alycaeus (*Charax*) *prosectus* (Benson); Kobelt and Möllendorff, 1898: 129
Alycaeus (*Dicharax*) *prosectus* Benson; Kobelt, 1902: 375; Gude, 1921: 266
Chamalycaeus (*Dicharax*) *prosectus* (Benson); Ramakrishna et al., 2010: 65; Páll-Gergely et al., 2020a: 151
Type material UMZC I.102775.A, **Fig. 30 E** (one of four syntypes from the R. McAndrew collection labelled "*Alycaeus Prosectus* Bens., Bens col.", no locality data)
Original measurements: "Diam. major 7, minor 6, axis 5 mill."
Other material NHMUK 1888.12.4.873–875 (three shells from the W. Theobald collection labelled "*Alycaeus prosectus* Benson, Khasi Hills")
Type locality India: "Hab. ad Teria Ghat" [lives at Teria Ghat]
Remarks The number of specimens was not noted in Benson's original description, although he remarked that it was "Found abundantly on rocks by Mr. Theobald." (Benson, 1857b: 203).

***Metalycaeus stylifer* (Benson, 1857)** comb. nov.

Alycaeus stylifer Benson, 1857b: 204; Pfeiffer, 1858: 37; Pfeiffer, 1860 [in 1854–1869], 1: 128, pl. 35, figs 24–27; Hanley and Theobald, 1874: 38, Pl. 92, Figs 1, 4; Reeve and Sowerby, 1877 [in 1875–1878], 20 (*Alycaeus*): pl. 6, Fig. 46; Nevill, 1878: 294; Godwin-Austen, 1914 [in 1897–1914]: 344, pl. 133, figs 2–2c
Alycaeus (*Charax*) *stylifer* Benson; Benson, 1859g: 177; Kobelt and Möllendorff, 1898: 129
Alycaeus (*Dicharax*) *stylifer* Benson; Kobelt, 1902: 376; Gude, 1921: 269, Fig. 35
Chamalycaeus (*Dicharax*) *stylifer* (Benson); Ramakrishna et al., 2010: 66
Type material UMZC I.102630.A, **Fig. 30 F** (holotype from the R. McAndrew collection labelled "*Alycaeus Stilifer* Bens., Bens. col., Darjeerling")
Original measurements: "Diam. maj. 5½, minor 4 2/3, axis 3½ mill."
Other material UMZC I.102630.B (second shell from the same lot); NHMUK 1860.6.27.29 (two shells presented by W.T. Blanford with a label in Benson's handwriting stating: "*Alycaeus stylifer* Benson, Darjiling")
Type locality India: "Hab. ad Darjiling. Teste H. Blanford" [lives at Darjiling according to H. Blanford]
Remarks Benson based his original description on a shell provided by Henry Blanford: "The single specimen from which the description above given was made is a dead and discoloured shell". We therefore identify UMZC I.102630.A, which matches this description and the dimensions provided in the original description, as the holotype. Additional specimens were present in a collection made by W.T. Blanford at Darjiling and subsequently reported by Benson (1859g: 181–182). Gude (1921) recorded this species from NE India (West Bengal-Darjeeling and Sikkim) and Bhutan. It has now been reported in Nepal (Budha et al., 2015).

Genus *Dioryx* Benson, 1859

***Dioryx amphora* (Benson, 1856)**

Alycaeus amphora Benson, 1856e: 226; Theobald, 1857: 247; Pfeiffer, 1858: 34; Pfeiffer, 1860 [in 1854–1869], 1: 126, pl. 35, figs 15–17; Hanley and Theobald, 1874 [in 1870–1876]: 38, Pl. 91, Figs 2, 3; Reeve and Sowerby, 1877 [in 1875–1878], 20 (*Alycaeus*): Pl. 2, Fig. 15; Nevill, 1878: 292
Alycaeus (*Dioryx*) *amphora* Benson; Godwin-Austen, 1914 [in 1897–1914]: 429, Pl. 153, Fig. 11

Dioryx amphora (Benson); Kobelt and Möllendorff, 1897: 149; Kobelt, 1902: 336; Gude, 1921: 198, Fig. 31

Type material UMZC I.102850, **Fig. 32 E** (syntype from the R. McAndrew collection labelled "*Alycaeus Amphora* Bens., Bens. col., Moulmein")

Original measurements: "Long. 5½, diam. obliq. 5 mill."

Other material NHMUK 1888.12.4.947, **Fig. 32 F** (one of four shells from the W. Theobald collection labelled "*Alycaeus amphora* Benson, Moulmein"); NHMUK 1906.5.5.23 (three shells from the W.T. Blanford collection labelled "*Alycaeus amphora* Bs., Moulmein, Tenasserim. Type of *Dioryx*, Figd.", with an additional note in the register entry stating that they were collected by Theobald); EXEMS: 1720/1909/D41/42/1 (single shell from the J.E. Linter collection labelled "*A. amphora* Ben., W.T." [William Theobald], no locality data)

Type locality Burma: "ad Moulmein, et in valle Tenasserim rara" [at Moulmein, and rarely in the Tenasserim Valley]

Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. Theobald (1857: 247) later noted that the species was rare. Gude (1921) figured a specimen from the BM but the illustration is not detailed enough and no further information exists to tie this to any particular specimen. This is the type species of *Dioryx* Benson, 1859 by subsequent designation (Gude, 1921: 198).

Dioryx urnula (Benson, 1853)

Alycaeus urnula Benson, 1853d: 284; Pfeiffer, 1854a: 88; 1858: 34; Hanley and Theobald, 1874 [in 1870–1876]: 38, Pl. 91, Figs 8, 9; Reeve and Sowerby, 1878 [in 1875–1878], 20 (*Alycaeus*): Pl. 2, Fig. 13; Nevill, 1878: 292

Alycaeus (*Dioryx*) *urnula* Benson; Benson, 1859g: 184; Godwin-Austen, 1888a: 245; Godwin-Austen, 1914 [in 1897–1914]: 345, Pl. 153, Fig. 1; 346, pl. 153, Fig. 2

Dioryx urnula (Benson); Kobelt and Möllendorff, 1897: 149; Kobelt, 1902: 340; Gude, 1921: 201; Ramakrishna et al., 2010: 74

Type material UMZC I.103780.A, **Fig. 32 D** (one of two syntypes from the R. McAndrew collection labelled "*Alycaeus Urnula* Bens., Bens. col., Darjiling")

Original measurements: "Diam. 3½, alt. 4½ mill."

Other material NHMUK 1860.6.27.25 (two shells presented by W.T. Blanford labelled "*Alycaeus urnula* Benson, Darjiling"); NHMUK 1906.4.4.40 (five shells from the W.T. Blanford collection labelled "*Alycaeus urnula* Bs., Rungun Valley, Darjiling", with an additional note stating "one large" in the register)

Type locality India: "Hab. ad Darjiling Himalayanum. Teste Dom. R. Trotter" [lives at Darjiling, Himalaya, according to R. Trotter]

Remarks The number of specimens provided by Robert Trotter was not noted in Benson's original description. Additional specimens of *A. urnula* present in the collection made by William Blanford in Darjiling, including the "large" shell present in NHMUK 1906.4.4.40, were mentioned by Benson in an updated description (Benson, 1859g: 182). The two UMZC syntypes are of very different sizes. The larger one, illustrated here, matches most closely the dimensions given by Benson. This variability prompted Godwin-Austen to name several varieties (see Gude, 1921: 202–203).

Genus *Pincerna* Preston, 1907

Pincerna bembex (Benson, 1859)

Alycaeus bembex Benson, 1859g: 178; Pfeiffer, 1865: 46; Hanley and Theobald, 1874 [in 1870–1876]: 39, Pl. 95, Figs 2, 3; Reeve and Sowerby, 1877 [in 1875–1878], 20 (*Alycaeus*): Pl. 5, Fig. 42; Nevill, 1878: 294; Kobelt, 1902: 342

Alycaeus (*Orthalycaeus*) *bembex* Benson; Kobelt and Möllendorff, 1897: 149

Alycaeus (*Cycloryx*) *bembex* Benson; Godwin-Austen, 1914 [in 1897–1914]: 346, pl. 147, figs 1, 1a; Gude, 1921: 275

Cycloryx bembex (Benson); Ramakrishna et al., 2010: 70

Pincerna bembex (Benson); Páll-Gergely *et al*., 2020a: 170

Type material UMZC I.102730, **Fig. 33 A** (syntype from the R. McAndrew collection labelled "*Alycaeus Bembex* Bens., Bens. col., Darjiling")

Original measurements: "Diam. major 4, minor 3, axis 4, long. 5 mill."

Other material NHMUK 1860.6.27.31, **Fig. 33 B** (one of two shells presented by W.T. Blanford labelled "*Alycaeus bembex* Bens., Darjiling", with a subsequent label stating "one smashed on tablet"); NHMUK 1906.4.4.44 (six shells from the W.T. Blanford collection labelled "*Alycaeus bembex* Bs., Darjiling, Type)

Type locality India: "Habitat in valle Rungun" [lives in the Rungun Valley]

Remarks Benson (1859g: 178) based his description on more than one specimen: "The specimens sent [by W.T. Blanford] are all weathered." Blanford presented two specimens to the NHM in 1860 as part of a small collection that included numerous Benson taxa from Darjiling; additional specimens from Blanford's collection were acquired in 1906 and registered by Godwin-Austen. The "Rungun valley" is most likely

to refer to the valley of the Rangnu Khola near Darjeeling, so the locality given for the Cambridge specimen is consistent with the type locality. In India this species is recorded from West Bengal and it has also been recorded in Bhutan (Ramakrishna et al., 2010).

Pincerna constricta (Benson, 1851)

Cyclostoma constrictum Benson, 1851e: 188; Benson, 1852c: 271; Pfeiffer, 1854 [in 1843–1854], 1(19), 379: pl. 49, figs 24–25
Alycaeus constrictus Benson; Pfeiffer, 1858: 35; Hanley and Theobald, 1874 [in 1870–1876]: 39, Pl. 95, Figs 1, 4; Reeve and Sowerby, 1877 [in 1875–1878], 20 (*Alycaeus*): Pl. 5, Fig. 41; Nevill, 1878: 294
Alycaeus (*Alycaeus*) *constrictus* (Benson); Benson, 1859g: 176; Kobelt, 1902: 343
Alycaeus (*Orthalycaeus*) *constrictus* (Benson); Kobelt and Möllendorff, 1897: 149
Alycaeus (*Cycloryx*) *constrictus* (Benson); Godwin-Austen, 1914 [in 1897–1914]: 347, pl. 147, figs 4, 4a; Gude, 1921: 277
Cycloryx constrictus (Benson); Ramakrishna *et al.*, 2010: 70
Pincerna constricta (Benson); Páll-Gergely, 2017: 214, Fig. 1A
Type material UMZC I.103745, **Fig. 33 C** (holotype from the R. McAndrew collection labelled "*Alycaeus Constrictus* Bens., Bens. col.", no locality data)
Original measurements: "Diam. 2, alt. 3½ mill."
Other material NHMUK 1906.4.4.41 (five shells from the W.T. Blanford collection labelled "*Alycaeus constrictus* Bs, Rungun Valley, Darjiling", with the attribution "T" [type] added to the register entry by Godwin-Austen)
Type locality India: "Hab. ad Darjiling Himalayae Sikkimensis" [lives at Darjiling, in the Himalaya of Sikkim]. In his later description of *Alycaeus stylifer* (Benson, 1859g:181), Benson stated that "It [*A. stylifer*] is noted, as well as *Alycaeus constrictus*, as occurring in the Rungun valley…"
Remarks Benson's ambiguous reference to "this shell" in his original description could be taken to mean a single specimen or the species more generally. He subsequently published an additional character based on "Another specimen of this shell from Darjiling" provided by Robert Trotter (Benson 1852c: 271), and later compared the four specimens of his *constrictus* var. *minor* (see below) with "the specimen which I noticed in the '*Annals*' for Oct. 1852", also remarking that "only a single specimen of the larger type is known; it is in a fresh state, but slightly mutilated" (Benson, 1859g: 181). This justifies the recognition of UMZC I.103745 as Benson's holotype. The catalogue of the W.T. Blanford collection, compiled by Godwin-Austen from 1906, lists the NHM specimens as types. However, there is no evidence that these specimens formed part of Benson's type series. This is the type species of *Cycloryx* Godwin-Austen, 1914, originally described as a subgenus of *Alycaeus*. Páll-Gergely (2017) recently placed *Cycloryx* in the synonymy of *Pincerna* Preston, 1906 but incorrectly listed NHMUK 1906.4.4.41 as part of the type series of *Cyclostoma constrictum*.

Pincerna constricta minor (Benson, 1859)

Accepted as *Pincerna constricta* (Benson, 1851)

Alycaeus constrictus var. *minor* Benson, 1859: 181
Alycaeus (*Cycloryx*) *constrictus* (Benson); Godwin-Austen, 1914 [in 1897–1914]: 348; Gude, 1921: 278
Pincerna constricta (Benson); Páll-Gergely, 2017: 214
Type material NHMUK 1860.6.27.26, **Fig. 33 D** (syntype from the W.T Blanford collection labelled "*Alycaeus constrictus* Benson var. *minor*, Darjiling, W.T. Blanford Esq.")
Original measurements: none given
Type locality India: Darjiling
Remarks Benson based his description of this small variety on four specimens in the collection of W.T. Blanford, conceding that "A fuller comparison of a series of fresh specimens of the two forms will be required to decide on their claim to separation" (Benson 1859g: 181). Godwin-Austen (1914: 388) eventually obtained more material showing that *constrictus* varied considerably in size, negating Benson's recognition of the validity of this variety (see also Gude, 1921: 278). The surviving specimen was presented to the BM by Blanford in 1860, together with numerous lots of Benson taxa from "Darjiling" that correspond closely with those described the previous year (Benson 1859g, h).

Pincerna otiphorus (Benson, 1859)

Alycaeus otiphorus Benson, 1859g: 178; Pfeiffer, 1865: 46; Hanley and Theobald, 1874 [in 1870–1876]: 39, Pl. 95, Figs 5, 6; Reeve and Sowerby, 1877 [in 1875–1878], 20 (*Alycaeus*): Pl. 4, Fig. 30; Nevill, 1878: 292
Alycaeus (*Alycaeus*) *otiphorus* Benson; Benson, 1859g: 176; Kobelt, 1902: 347
Alycaeus (*Orthalycaeus*) *otiphorus* (Benson); Kobelt and Möllendorff, 1897: 150
Alycaeus (*Cycloryx*) *otiphorus* Benson; Godwin-Austen, 1914 [in 1897–1914]: 349: pl. 147, figs 2, 2a, 2b; Gude, 1921: 283
Cycloryx otiphorus (Benson); Ramakrishna et al., 2010: 73

Pincerna otiphorus (Benson); Páll-Gergely *et al*., 2020a: 182

Type material UMZC I.102555, **Fig. 33 E** (syntype from the R. McAndrew collection labelled "*Alycaeus Otiphorus* Bens., Bens. col.", no locality data)

Original measurements: "ong. 4½, diam. obliq. 4 mill."

Other material UMZC I.102560, **Fig. 33 F** (single shell from the R. McAndrew collection, formerly mounted on a small square of wood on which has been written in pencil "BENSON *otiphorus* B.", no locality data); NHMUK 1906.4.4.43 (five shells from the W.T. Blanford collection labelled "*Alycaeus otiphorus* Bs., Darjiling, typical")

Type locality India: "Habitat ad Pankabari (1000 ped. alt.) et in valle Rungun (4000 ped.) prope Darjiling Himalayanum" [lives at Pankabari (altitude of 1000 feet) and in the Rungun Valley (4000 feet) near Darjiling in the Himalaya]

Remarks Benson received an unspecified number of shells from Henry Blanford in 1857, although it is probable that there were several since the species was described as "not uncommon on the west side of the Rungun Valley, as well as at a lower elevation in the Sikkim ranges" (Benson, 1859g: 178). UMZC I.102560 is not clearly labelled as coming from the Benson Collection, although this is the most likely source. This species has been identified from several localities in NE India (West Bengal-Darjeeling, Sikkim-Pankhabari, Meghalaya, Nagaland) (Gude, 1921; Ramakrishna et al., 2010) and Nepal (Kuznetsov, 1996; Budha et al., 2015).

Family DIPLOMMATINIDAE

Genus *Diplommatina* Benson, 1849

Subgenus *Diplommatina* Benson, 1849

Diplommatina (*Diplommatina*) *blanfordiana* Benson, 1860

Diplommatina blanfordiana Benson, 1860h: 460; Pfeiffer, 1865: 9; Godwin-Austen, 1868: 83, Pl. 1, Fig. 8a; Godwin-Austen, 1886 [in 1882–1888]: 169, pl. 49, figs 10, 10a; Gude, 1921: 304; Ramakrishna et al., 2010: 83

Diplommatina blanfordi Benson; Hanley and Theobald, 1874 [in 1870–1876]: 49, Pl. 119, Figs 5–6; Nevill, 1878: 287

Diplommatina (*Eudiplommatina*) *blanfordiana* Benson; Kobelt and Möllendorff, 1898: 135

Diplommatina (*Diplommatina*) *blanfordiana* Benson; Kobelt, 1902: 426

Type material UMZC I.103335.A, **Fig. 34 A** (one of four syntypes from the R. McAndrew collection labelled "*Diplomatina Blanfordi* Bens., Bens. col."; these are associated with small labels in Benson's writing that read "*Diplom. Blanfordi* B" and "Darjiling")

Original measurements: "Long. 4½, diam. 2 1/3 mill."

Other material UMZC I.103330 (single shell from the R. McAndrew collection labelled by Hanley "*Diplommatina Blanfordi* figured in Conch. Indica", no locality or collection data); NHMUK 1906.4.4.13 (six shells from the W.T. Blanford collection labelled "*Diplommatina blanfordiana* Bs., Darjiling"); NHMUK 20200356 (34 shells from the H.F/W.T. Blanford collection labelled "*Diplom. Blanfordiana* Bens, Darjiling [illeg.], 43")

Type locality India: "Habitat prope Darjiling. Teste W.T. Blanford" [lives near Darjiling according to W.T. Blanford]

Remarks The number of specimens provided by William Blanford was not noted in Benson's original description. This species has also been recorded from Bhutan (Ramakrishna et al., 2010).

Diplommatina (*Diplommatina*) *costulata* Benson, 1849

Diplommatina costulatum Hutton MSS in Benson, 1849a: 194; Godwin-Austen, 1868: Pl. 1, Fig. 4

Diplommatina costulatum Benson; Hanley and Theobald, 1874 [in 1870–1876]: 49, Pl. 120, Figs 8, 9

Diplommatina costulata Hutton; Nevill, 1878: 287

Diplommatina (*Eudiplommatina*) *costulata* Benson; Kobelt and Möllendorff, 1898: 136

Diplommatina (*Diplommatina*) *costulata* Benson; Kobelt, 1902: 429; Gude, 1921: 307; Ramakrishna et al., 2010: 84

Type material UMZC I.102340.A, **Fig. 34 B** (one of 17 syntypes from the R. McAndrew collection labelled "*Diplomatina* [sic] *Costulata* Hutton, Bens. col." A printed label with the specimens reads "Landour")

Original measurements: "Long. 2 mill., diam. vix 1 mill."

Type locality India: "Hab. in montibus sub-Himalayanis occidentalibus" [lives in the western Sub-Himalayan mountains]

Remarks Benson appears to have based his description on several specimens, which were "abounding in masses of decayed leaves, and under stones, in damp situations beneath trees, on the shady sides of the mountains, at from 5000 to 9000 feet elevation, at Simla, Mussoorie and Landour" (Benson, 1849a: 194). This species appears to be known only from the Western Himalya (Ramakrishna et al., 2010).

Diplommatina (*Diplommatina*) *diplocheilus* Benson, 1857

Diplommatina diplocheilus Benson, 1857b: 202; Pfeiffer, 1858: 10; Pfeiffer, 1860 [in 1854–1869], 2, 142: pl. 37, figs 13–15; Godwin-Austen, 1868: 83, Pl.

2, Fig. 1a; Hanley and Theobald, 1875 [in 1870–1876]: 55, Pl. 140, Figs 2, 3 (as *diplocheilos*); Nevill, 1878: 286

Diplommatina (*Eudiplommatina*) *diplochilus* Benson; Kobelt and Möllendorff, 1898: 136

Diplommatina (*Diplommatina*) *diplochilus* Benson; Kobelt, 1902: 430; Gude, 1921: 311; Ramakrishna et al., 2010: 85

Type material UMZC I.102620.A, **Fig. 34 C** (one of four syntypes from the R. McAndrew collection labelled "*Diplomatina* [sic] *Diplocheilus* Bens., Bens. col.", no locality data)

Original measurements: "Long. 3, diam. 2 mill."

Other material UMZC I.102625 (single shell from the R. McAndrew collection labelled by Hanley "figured in Conch. Indica, DIPLOMMATINA diplocheilus", no locality or collection data); NHMUK 1888.12.4.144–147 (four shells from the W. Theobald collection labelled "*Diplommatina diplocheilus* Benson, Khasi Hills); EXEMS: 1720/1909/D41/87/1–5 (five shells from the J.E. Linter collection labelled "*D. diplocheilus* Ben., Khasi, W.T." [William Theobald])

Type locality India: "Hab. ad Teria Ghat, Montium Khasia dictorum portam, satis frequens. Teste W. Theobald" [lives at Teria Ghat, at the foot of the so-called Khasia hills, quite commonly, according to W. Theobald]

Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. The change of the spelling of *diplocheilus* is an unjustified emendation (ICZN, 1999, Article 32).

Diplommatina (*Diplommatina*) *pachycheilus* Benson, 1857

Diplommatina pachycheilus Benson, 1857b: 203; Pfeiffer, 1858: 10; Pfeiffer, 1860 [in 1854–1869], 2, 143: pl. 37, figs 16–18; Benson, 1860h: 460; Godwin-Austen, 1868: 83, Pl. 1, Fig. 5; Hanley and Theobald, 1875 [in 1870–1876]: 55, Pl. 140, Figs 5, 6; Nevill, 1878: 287

Diplommatina (*Eudiplommatina*) *pachychilus* (Benson); Kobelt and Möllendorff, 1898: 136

Diplommatina (*Diplommatina*) *pachychilus* Benson; Kobelt, 1902: 440; Gude, 1921: 327; Ramakrishna et al., 2010: 90; Budha et al., 2015: 7

Type material a neotype (UMZC I.102595.A, **Fig. 34 D**) is here designated from a series of five shells in the R. McAndrew collection labelled "Darjiling"). We have designated a neotype with the express purpose of clarifying the taxonomic status of *D. pachycheilus* (see below).

Original measurements: "Long. 4, diam. 2 1/3 mill."

Other material UMZC I.102600 (three shells from the R. McAndrew collection labelled "Darjiling", no collection data); NHMUK 1906.4.4.11 (eight shells from the W.T. Blanford collection labelled "*Diplommatina pachycheilus* Bs., Darjiling, about 4000 ft.")

Type locality India: "Hab. ad Darjiling. Teste H. Blanford" [lives at Darjiling, according to H. Blanford]

Remarks Benson based his original description on a single shell, lacking its operculum, found at Darjiling by Henry Blanford, but he later noted that further specimens from the Rungun Valley "about the mineral spring of Sungfoot" were subsequently supplied by Henry Blanford and represented in the collection of W.T. Blanford (Benson, 1859g: 183). He also provided a description of additional characters noticed when comparing the species with *D. blanfordiana* (Benson, 1860h: 460). The change of spelling of *pachycheilus* is an unjustified emendation under ICZN, 1999, Article 32). Gude (1921) recorded this species from NE India (West Bengal-Darjeeling). It has since been found in Nepal (Kuznetsov and Schileyko, 1997; Budha et al., 2015; 2017b).

Diplommatina (*Diplommatina*) *polypleuris* Benson, 1857

Diplommatina polypleuris Benson, 1857b: 203; Pfeiffer, 1858: 11; Godwin-Austen, 1868: 83, Pl. 3, Fig. 1; 1870: 4, Pl. 1, Fig. 4; Theobald and Stolicka, 1872: 330; Hanley and Theobald, 1875 [in 1870–1876]: 55, Pl. 140, Fig. 10; Nevill, 1878: 285; Godwin-Austen, 1886 [in 1882–1888]: 176, pl. 45, figs 1, 1a; Gude, 1921: 328

Diplommatina (*Eudiplommatina*) *polypleuris* (Benson); Kobelt and Möllendorff, 1898: 137

Diplommatina (*Diplommatina*) *polypleuris* (Benson); Kobelt, 1902: 441; Ramakrishna et al., 2010: 91

Type material UMZC I.102640 (syntype from the R. McAndrew collection labelled "*Diplommatina Polypleuris* Bens., Bens. col.", no locality data)

Original measurements: "Long. vix 2, diam. 1 mill."

Other material UMZC I.102645, **Fig. 34 E** (single shell from the R. McAndrew collection labelled by Hanley "bottom DIP polypleuris" and later by Bishop "*Diplommatina polypleuris* Benson, *Conch. Ind*. Pl. 140, Fig. 10", no locality or collection data).

Type locality India: "Hab. ad Nanclai, non raro" [lives at Nanclai, not rare]

Remarks This species was discovered by William Theobald at Nanclai Ponji, forty-five miles from Cherra (92° 30′ E and 25° 15′ N). The number of specimens examined was not noted in Benson's original description but it was said to be common at its type locality. Theobald and Stolicka (1872: 330) reported that *D. polypleuris* "occurs abundantly in the Sandoway district and at Nattoung, more rarely near Moulmein".

***Diplommatina* (*Diplommatina*) *pullula* Benson, 1859**

Diplommatina pullula Benson, 1859g: 182; Pfeiffer, 1858: 11; Pfeiffer, 1865: 9; Godwin-Austen, 1868: 83, Pl. 1, Fig. 7; Hanley and Theobald, 1874 [in 1870–1876]: 49, Pl. 119, Fig. 7; Nevill, 1878: 287; Godwin-Austen, 1886 [in 1882–1888]: 170, Pl. 49, Fig. 12; Gude, 1921: 328
Diplommatina (*Eudiplommatina*) *pullula* Benson; Kobelt and Möllendorff, 1898: 137
Diplommatina (*Diplommatina*) *pullula* Benson; Kobelt, 1902: 441; Ramakrishna et al., 2010: 91
Type material UMZC I.102530, **Fig. 34 F** (syntype from the R. McAndrew collection with a small circular label in Benson's handwriting that reads "*D. pullula*", no locality data)
Original measurements: "Long. 3, diam. 1¼ mill."
Other material UMZC I.102525 (three shells from the R. McAndrew collection labelled "Darjiling", no collection data, one of which was figured by Hanley and Theobald, 1874 [in 1870–1876]); NHMUK 1860.6.27.21 (single shell presented by William Blanford labelled "*Diplommatina pullula* Benson, Darjiling, W.T. Blanford Esq."); NHMUK 1906.4.4.12 (four shells, two of which are broken, from the W.T. Blanford collection labelled "*Diplommatina pullula* Bs., Darjiling")
Type locality India: "Habitat in valle Rungun, ad latus occidentale" [lives in the Rungun Valley, on the western side]
Remarks The number of specimens collected by William Blanford was not noted in the original description.

Genus *Velepalaina* Iredale, 1937

***Diplommatina australiae* Benson, 1855**

Accepted as *Velepalaina strangei* (L. Pfeiffer, 1854); *Pupa strangei* Pfeiffer, 1854b: 69

Diplommatina australiae Benson, 1855d: 331; Pfeiffer, 1858: 13
Type material not located
Original measurements: "Long. 3½, diam. vix 2 mill."
Type locality Australia: "ad Mount Warren, Point Danger, Australiae Orientalis. Teste Strange" [at Mount Warren, Point Danger, Western Australia. Found by Strange]
Remarks The number of specimens found by Frederick Strange "under dead leaves in the brushes" was not noted by Benson. The type series cannot be located. Iredale (1937) listed *Diplommatina australiae* in the synonymy of *Velepalaina strangei* (see also Smith, 1992: 39).

Family MAIZANIIDAE

Genus *Maizania* Bourguignat, 1889

Subgenus *Maizania* Bourguignat, 1889

***Maizania* (*Maizania*) *wahlbergi* (Benson, 1852)**

Cyclostoma wahlbergi Benson, 1852c: 271; Pfeiffer, 1854 [in 1843–1854], 1(19): 386, pl. 50, figs 17–19
Cyclophorus wahlbergi (Benson); Pfeiffer, 1858: 59; Reeve, 1861 [in 1859–1862], 13 (Cyclophorus): pl. 17, species 81
Cyclophorus (*Theobaldius* ?) *wahlbergi* (Benson); Nevill, 1878: 277
Cyclophorus (*Maizania*) *wahlbergi* (Benson); Kobelt, 1902: 152; Connolly, 1912: 251
Maizania wahlbergi (Benson); Connolly, 1939: 535; Herbert and Kilburn, 2004: 93
Type material a neotype (UMZC I.103820.A, **Fig. 35 A**) is here designated from a series of four shells in the R. McAndrew collection labelled "*Cyclophorus Wahlbergi* Bens., Bens. col., Natal"). We have designated a neotype with the express purpose of clarifying the taxonomic status of *C. wahlbergi* (see below).
Original measurements: "Diam. major 14, minor 11, axis 7 mill."
Type locality South Africa: "This is probably the species which Wahlberg got at Natal [Durban]..."
Remarks The original description was apparently based on a single specimen: "The example described was collected at Natal, with *Bulimus Kraussi*, and transmitted to Mr S. Stevens with other specimens of smaller size". Connolly (1912: 251; 1939: 536) stated that the original specimens were in the Cambridge Museum (i.e. UMZC). *Cyclostoma wahlbergi* was designated as the type of *Natalia* Godwin-Austen, 1897 (page 22), a junior primary homonym of *Natalia* Gray, 1840 (Echinodermata). In recognition of this, Godwin-Austen (1897: 46) provided the replacement name *Hijabia* Godwin-Austen. *Hijabia* is a subjective synonym of *Maizania*. *Maizania wahlbergi* is a common species of the eastern Cape, where it lives primarily in dune and coastal lowland forest, but also in riverine forest in leaf-litter, under sandy soil and under logs, usually in dense shade (Herbert and Kilburn, 2004).

Family PUPINIDAE [7]

Subfamily PUPININAE

Genus *Tylotoechus* Kobelt & Möllendorff, 1897

***Tylotoechus artatus* (Benson, 1856)**

Pupina artata Benson, 1856e: 230; Theobald, 1857: 247; Pfeiffer, 1858: 96; Benson, 1859i: 94; Pfeiffer, 1860

[in 1854–1869], 2, 142: pl. 37, figs 10–12; Hanley and Theobald, 1870 [in 1870–1876]: 4, Pl. 7, Fig. 5; Reeve and Sowerby, 1876 [in 1875–1878], 20 (Pupinidae): pl. 1, species 3; Nevill, 1878: 299; Godwin-Austen, 1897 [in 1897–1914]: 38: Pl. 69, Fig. 6

Pupina (*Tylotoechus*) *artata* Benson; Kobelt and Möllendorff, 1897: 145; Kobelt, 1902: 306; Gude, 1921: 193

Type material UMZC I.102960.A, **Fig. 35 B** (one of five syntypes, two with opercula, from the R. McAndrew collection labelled "*Pupina Artata* Bens., Bens. col., Moulmein"); UMZC I.102965 (four syntypes, one with operculum, from the McAndrew collection labelled "*Pupina Artata* Bens., Bens. col.", no locality data)

Original measurements: "Long. 6, diam. 3½ mill."

Other material NHMUK 1906.4.4.28 (six shells from the W.T. Blanford collection labelled "*Pupina artata* Bs, Moulmein"); NHMUK 20191090 (three shells from the A.J. Peile collection labelled *Pupina* (*Tylotoechus*) *artatus* Benson. (Moulmein, Burma), Theobald Colln.")

Type locality Burma: "Hab. ad Moulmein satis frequens" [lives quite commonly at Moulmein]

Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. Theobald (1857: 247) noted that the species was "not uncommon, among dead leaves and rubbish at the foot of rocks". He also stated "By the habitat "Maulmein" the "Farm caves" in limestome hills a few miles distant are intended". Benson (1859i) subsequently provided a description of the animal of this species, based on living specimens provided by Capt. Haughton. The specimen illustrated here has a pale shell but the others in the lot are pale brown. The NHM material from the Blanford collection may have come from Theobald (fide Godwin-Austen), although this is not certain. This species has also been recorded from Peninsular Malaysia and Thailand (Maassen, 2001; Foon et al., 2017).

Tylotoechus arulus (Benson, 1856)

Pupina arula Benson, 1856e: 230; Theobald, 1857: 247; Pfeiffer, 1858: 95; Pfeiffer, 1860 [in 1854–1869], 2, 141: pl. 37, figs 7–9; Hanley and Theobald, 1870 [in 1870–1876]: 4, Pl. 7, Fig. 4; Reeve and Sowerby, 1876 [in 1875–1878], 20 (Pupinidae): pl. 1, species 5; Nevill, 1878: 300; Godwin-Austen, 1897 [in 1897–1914]: 37, Pl. 69, Fig. 1

Pupina (*Tylotoechus*) *arula* Benson; Kobelt and Möllendorff, 1897: 145; Kobelt, 1902: 307; Gude, 1921: 193

Type material UMZC I.103025, **Fig. 35 C** (syntype from the R. McAndrew collection labelled "*Pupina Arula* Bens., Bens. col., Ind.")

Original measurements: "Long. 9, diam. 5 mill."

Other material NHMUK 1888.12.4.109, **Fig. 35 D** (single shell from the W. Theobald collection labelled "*Pupina arula* Benson (typical), Yunglaw")

Type locality Burma: "Hab. ad Yunglaw, in valle Tenasserim" [lives at Yunglaw, in the Tenasserim Valley]

Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. Theobald (1857: 247) later noted that the species was very rare and found amongst dead leaves. The locality information for UMZC I.103025 has been degraded to "Ind." on McAndrew's label, but we accept the specimen as part of the type series. NHMUK 1888.12.4.109 is from the type locality but there is no evidence it was amongst the shells examined by Benson.

Tylotoechus imbriciferus (Benson, 1856)

Pupina imbricifera Benson 1856e: 230; Pfeiffer, 1858: 94; Pfeiffer, 1860 [in 1854–1869], 2, 140: pl. 37, figs 4–6; Sowerby, 1864 [in 1842–1887], iii, pl. 265, figs 4, 5; Hanley and Theobald, 1870 [in 1870–1876]: 4, Pl. 7, Fig. 7; Reeve and Sowerby, 1876 [in 1875–1878], 20 (Pupinidae): Pl. 1, Fig. 7; Nevill, 1878: 300

Pupina (*Tylotoechus*) *imbricifera* Benson; Kobelt and Möllendorff, 1897: 146; Kobelt, 1902: 315; Gude, 1921: 195; Ramakrishna et al., 2010: 102

Type material UMZC I.102835, **Fig. 35 E** (one of two syntypes from the R. McAndrew collection labelled "*Pupina Umbricifera* [sic] Bens., Bens. col., Silhet")

Original measurements: "Long. 10, diam. anfract. Penult. 5 mill."

Type locality Bangladesh: "Hab. in provincia Bengalensi orientali Sylhet" [lives in Sylhet in eastern Bengal province]

Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. This species has also been recorded from Meghalaya, India (Ramakrishna et al., 2010).

Tylotoechus peguensis (Benson, 1860)

Pupina peguensis Benson, 1860c: 192; Pfeiffer, 1865: 95; Nevill, 1878: 300; Godwin-Austen, 1897 [in 1897–1914]: 40, pl. 69, figs 3a–d

Pupina blanfordi (non Theobald); Hanley and Theobald, 1870 [in 1870–1876]: 4, Pl. 7, Fig. 6

Pupina (*Tylotoechus*) *peguensis* Benson; Kobelt and Möllendorff, 1897: 147; Kobelt, 1902: 319; Gude, 1921: 197

Type material NZSI M.32940/9, **Fig. 35 F** (syntype labelled "*Pupina peguensis* Benson, Shui Geen, Burma, A.S. [Asiatic Society], Berdmore", here designated as the lectotype)
Original measurements: "Long. 6, diam. 3½ mill."
Other material NHMUK 1888.12.4.105–106 (two shells from the W. Theobald collection labelled "*Pupina peguensis*? Bens., Jurgabin, see paper inside box". Another label, possibly in Theobald's handwriting, reads "? *Peguensis*. A is a little thicker but possibly Benson's species. Nothing can be done without a comparison of the type. Blanford's is a var. of *artata*"); NHMUK 1906.4.4.29 (eight shells from the W.T. Blanford collection, seven of which are labelled "*P. peguensis* B., Pegu", accompanied by another label with the number 29. The last shell is kept separately and labelled "*Pupina peguensis* Bs., Kama, R. Irrawady, sp. fig[d] Moll. Ind. Pl. LXIX Fig. 3–3d"); NHMUK 20210287 (three shells from the H.F. Blanford collection labelled "*Pupina peguensis* W. Blanf., ex coll. Auctoris [i.e. ex-Benson coll.], Thyet Myo, Prome")
Type locality Burma: "Habitat in regione Peguensi. Mus. Soc. Asiat. Calcuttensis" [lives in the Pegu region. Museum of the Asiatic Society, Calcutta]
Remarks The number of specimens examined was not noted in Benson's original description, which was based on material in the Museum of the Asiatic Society. Nevill (1878: 300) listed a specimen in the Indian Museum from "Shuay-Gheen, Burma (type); ex c. As. Soc., Bengal; coll. Captain Berdmore". The note that accompanies NHMUK 1888.12.4.105–106 also alludes to a single "type" specimen, but there is no clear evidence that Benson based his description on a single shell. In their recent assessment of a specimen in the ZSI, Tripathy and Sajan (2019: 507) incorrectly stated that Benson referred to a single type specimen and that Nevill did not attribute type status to the specimen in the Indian Museum (see preceding remarks). Moreover, their measurements ("SH 6.5 mm, SW 4.5 mm") do not agree with those given by Benson ("Long. 6, diam. 3½ mill."), suggesting that Benson might have measured another shell, now lost. We therefore disagree with their suggestions that NZSI M.32940/9 is the "holotype" and instead regard it as a syntype.

Subfamily PUPINELLINAE

Genus *Pseudopomatias* Möllendorff, 1885

Pseudopomatias himalayae (Benson, 1859)

Pomatias himalayae Benson, 1859g: 183; Sowerby, 1864 [in 1842–1887], iii: 266: pl. 259, figs 19, 20; Pfeiffer, 1865: 169; Hanley and Theobald, 1870 [in 1870–1876]: 4, Pl. 7, Fig. 9
Pomatias himalayanus Benson; Nevill, 1878: 255
Pseudopomatias himalayae (Benson); Kobelt and Möllendorff, 1897: 142; Kobelt, 1902: 273; Gude 1921: 159; Ramakrishna et al., 2010: 104
Material a neotype (UMZC I.102695.A, **Fig. 36 A**) is here designated from a series of two shells from the R. McAndrew collection labelled "*Pomatias Himalaya*, Darjiling"). We have designated a neotype with the express purpose of clarifying the taxonomic status of *P. himalayae* (see below).
Original measurements: "Long. 5½–10, diam. 2½–4 mill. Apertura majoris 3 mill. longa, 2½ lata."
Type locality India: "Darjiling"
Original locality India: "Habitat copiose in valle Rungun (4000 ped.) nec non ad Darjiling (7000 ped.)" [lives abundantly in the Rungun Valley (4000 feet) and also at Darjiling (7000 feet)]
Remarks Benson examined an unspecified number of shells from William Blanford's collection to produce his original description. However, only one operculum was available: "A single operculum contained in the collection cannot be examined in order to ascertain its internal structure ..." (Benson, 1859g: 183). The two UMZC shells cannot be linked to the Benson collection, although this is the most likely source. Páll-Gergely et al. (2015a) provided a re-description of this species as part of a revision of the genus *Pseudopomatias*. They demonstrated that several samples supposedly belonging to this species in museum collections were actually mixed lots with other taxa. Confirmed specimens of *P. himalayae* are known only from Darjeeling and Sikkim (Páll-Gergely et al., 2015a).

Pseudopomatias pleurophorus (Benson, 1857)

Bulimus pleurophorus Benson, 1857a: 329; Pfeiffer, 1859 [in 1847–1877]: 474
Pomatias pleurophorus (Benson); Benson, 1859g: 183; Pfeiffer, 1865: 169; Hanley and Theobald, 1870 [in 1870–1876]: 4, Pl. 7, Fig. 10; Godwin-Austen, 1876: 181; Nevill, 1878: 254
Pseudopomatias pleurophorus (Benson); Kobelt and Möllendorff, 1897: 142; Kobelt, 1902: 274; Gude, 1921: 160; Ramakrishna et al., 2010: 105
Type material NHMUK 1888.12.4.329, **Fig. 36 B** (holotype from the W. Theobald collection labelled "*Pomatias pleurophorus* Benson, Khasi Hills")
Original measurements: "Long. 8, diam. 3½ mill."
Type locality India: "Hab. Rarissime ad Teria Ghat, Montium Khasia. Teste W. Theobald" [lives very rarely at Teria Ghat, Khasia hills, according to W. Theobald]
Remarks Benson based his original description on a single specimen provided by William Theobald. Examination of specimens of *Pomatias himalayae* later

convinced Benson that he had erroneously attributed this species to *Bulimus*, and he placed it in *Pomatias* (Benson, 1859g: 183). Páll-Gergely et al. (2015a) provided a re-description and a list of localities in different provinces (e.g. Arunachal Pradesh and Meghalaya) in North-East India from which this species has been identified.

Genus *Streptaulus* Benson, 1857 [8]

Streptaulus blanfordi Benson, 1857

Streptaulus blanfordi Benson, 1857b: 201; Pfeiffer, 1858: 92; Pfeiffer, 1860 [in 1854–1869], 2, 139: pl. 37, figs 1–3; Hanley and Theobald, 1875 [in 1870–1876]: 53, Pl. 133, Figs 5, 6; Nevill, 1878: 302; Kobelt, 1902: 277, Fig. 61
Rhaphaulus blanfordi (Benson); Reeve and Sowerby, 1876 [in 1875–1878], 20 (Pupinidae): Pl. 10, Fig. 97; Godwin-Austen, 1886 [in 1882–1888]: 202, Pl. 47, Fig. 4; Gude, 1921: 164, Fig. 42
Helix calpis Benson, 1859h: 268; Blanford, 1880: 212
Rhaphaulus (*Streptaulus*) *blanfordi* (Benson); Kobelt and Möllendorff, 1897: 142
Raphaulus blanfordi (Benson); Ramakrishna et al., 2010: 106
Type material UMZC I.102675.A, **Fig. 36 C** (one of two syntypes from the R. McAndrew collection, with two circular labels in Benson's handwriting that read "*Streptaulus blanfordi* B., Darjiling" and *Streptaulus blanfordi*, Sikkim, 28", and another in Hanley's handwriting that reads "figured in Conch. Indica")
Original measurements: "Long. 7½, dima. 5 mill. Long. apert. (peristomate incluso) 4 mill."
Other material NHMUK 1906.1.1.976 (five shells from the W.T. Blanford collection labelled "*Raphaulus blanfordi* Bs., Nampok, Sikkim, Typical", with an entry in the Blanford register compiled by Godwin-Austen stating "marked Type"); NHMUK 20190428 (eight shells from the H.F. Blanford collection, labelled "*Streptaulus Blanfordi* Bens., Darjiling"); NHMUK 20190429 (four shells from the H.F./W.T. Blanford collection labelled "*Streptaulus blanfordi* Bens, Darjiling")
Type locality India: "Hab. prope Darjiling, in montibus Himalayanis Sikkimensibus. Teste H. Blanford" [lives near Darjiling, on the Sikkim side of the Himalayan mountains, according to H. Blanford]
Remarks The number of specimens provided by Henry Blanford was not recorded in Benson's original description. He noted that *Streptaulus* (with *blanfordi* as its type species) has a long sutural tube, unlike shells of *Rhaphaulus* that have a short tube pointing upwards above the aperture or ending in a short upright tube (Benson, 1857b: 202). This generic distinction was upheld by Kobelt (1902), who mentioned other distinguishing shell characters, such as the sculpture (shiny in *Streptaulus* and ribbed with dark periostracum in *Rhaphaulus*) and the strength and formation of the apertural rim. Subsequent authors (e.g. Gude, 1921) did not maintain the generic separation and *blanfordi* was placed in *Rhaphaulus* L. Pfeiffer, 1856, which has priority over *Streptaulus* Benson, 1857. Further shell characters that might be useful in distinguishing *Streptaulus* from *Rhaphaulus* were discussed by Páll-Gergely et al. (2014) but they found much variation and left the problem unresolved. However, in a recent paper the generic distinction of *Streptaulus* and *Rhaphaulus* was upheld based on differences in the development of the parietal callus, the nature of the periostome and the form of the breathing tube (Páll-Gergely et al., 2017b). The figured syntype (UMZC I.102675.A) matches the description and measurements provided by Benson. Associated non-type material from the collections of the Blanford brothers includes shells found by Henry Blanford, specimens from the William Blanford collection (Godwin-Austen noted that some of Henry Blanford's specimens were incorporated into the latter) and material labelled as "H.F./W.T. Blanford colln", illustrating the difficulty in identifying and separating Blanford specimens. The species has recently been recorded from Bhutan (Gittenberger et al., 2017a, 2019b)

Helix calpis Benson, 1859

Accepted as *Streptaulus blanfordi* Benson, 1857b: 201

Helix calpis Benson, 1859h: 268; Pfeiffer, 1868 [in 1847–1877]: 64; Hanley and Theobald, 1870 [in 1870–1876]: 8, Pl. 16, Fig. 8; Gude, 1921: 164 (under *Rhaphaulus blanfordi*)
Nanina (*Microcystis*) *calpis* (Benson); Nevill, 1878: 38
Material UMZC I.104200, **Fig. 36 D** (single fragmented shell from the R. McAndrew collection labelled "*Conulus*? *Calpis*, Darjeerling", no collection data, with an additional note "young of *Streptaulus* W.M." on the back); NHMUK 1860.6.27.11 (single shell presented by W.T. Blanford labelled "*Helix calpis* Benson, Darjiling. Now proved to be immature *Rhaphaulus blanfordi* Benson")
Original measurements: "Diam. major 4, long. 5½ mill. ; apert. long. 3, diam. 2 mill."
Type locality India: "Habitat in valle Rungun, prope Darjiling" [lives in the Rungun Valley, near Darjiling]
Remarks Benson based his original description on four shells: "Four specimens in different stages of growth, and all more or less injured, were sent by Mr. W.T. Blanford, who thought it was a dwarf variety of *H.*

radicicola." The NHM specimen was presented in 1860 by W.T. Blanford as part of a donation of 39 lots, most of which were Benson species. Blanford (1880: 212) later wrote [of *H. calpis*]: "This species was described from specimens collected by myself in 1856. I had but an imperfect knowledge of land mollusks at the time, or I should have seen at once, as I did some years afterwards, when re-examining my collection, that the shells were all young specimens of *Raphaulus* (*Streptaulus*) *blanfordi*".

Genus *Coptocheilus* Gould, 1862 [9]

Coptocheilus anostomus (Benson, 1852)

Cyclostoma anostoma Benson, 1852c: 269
Megalomastoma anostoma (Benson); Pfeiffer, 1854a: 89; 1858: 85
Schistoloma anostoma (Benson); Kobelt, 1902: 278; Yen, 1942: 172
Coptocheilus anostomus (Benson); Chinh and Páll-Gergely, 2020: 449
Type material UMZC I.104040.A, **Fig. 36 E** (holotype from the R. McAndrew collection labelled "*Megalomastoma Anostoma* Bens., Bens. col., Labuan")
Original measurements: "Axis 23, diam. anfr. penult. 10, diam. apert. extern. 9, alt. apert. 7½ mill."
Other material UMZC I.104040.B (single shell and operculum from the same lot)
Type locality Borneo: "Hab. in Insula Borneo" [lives on the Island of Borneo]
Remarks The original description (Benson, 1852a: 269) was based on a single specimen received from Dr Bacon, of which "the summit and succeeding whorl are white" and "two slightly impressed lines traverse the last whorl spirally". The smaller of the two shells (UMZC I.104040.A) possesses these characteristic features and is therefore considered to be the holotype. The other specimen (UMZC I.104040.B) is likely to be the shell sent to Benson by Dr Traill sometime later, found "in the depths of the forest on the island of Labuan, invariably on the leaves of trees" (Benson, 1853a: 32). Chinh and Páll-Gergely (2020: 448) restored the genus *Coptocheilus* Gould, 1862, relegating the unnecessary replacement name *Schistoloma* Kobelt, 1902.

Coptocheilus funiculalus (Benson, 1838) [9]

Cyclostoma funiculalum Benson, 1838b: 217; Benson, 1853c: 272
Cyclostoma funiculatum Sowerby, 1850 [in 1842–1887]: 166, pl. 31b, figs 316, 317
Megalomastoma funiculatum Benson; Pfeiffer, 1858: 85; Benson, 1859k: 238
Megalomastoma funiculatum (Sowerby); Hanley and Theobald, 1870 [in 1870–1876]: 4, Pl. 7, Fig. 2; 1875 [in 1870–1876]: 53, Pl. 133, Fig. 1 (var.); Reeve and Sowerby, 1876 [in 1875–1878], 20 (Pupinidae): Pl. 8, Fig. 75
Megalomastoma (*Coptocheilus*) *funiculatum* Benson; Nevill, 1878: 295
Coptocheilus funiculatus (Benson); Kobelt and Möllendorff, 1897: 141
Schistoloma funiculatum (Sowerby); Kobelt, 1902: 279; Gude, 1921: 169, Fig. 25
Coptocheilus funiculalus (Benson); Chinh and Páll-Gergely, 2020: 449
Type material UMZC I.102140 (12 syntypes, one with operculum, from the R. McAndrew collection labelled "*Megalomastoma Funiculatum* Bens., Bens. col. Darjiling", one of which (UMZC I.102140.A, **Fig. 36 F**) is hererby designated as the lectotype); NHMUK 1954.6.2.1230 (two syntypes from the J.S. Hawkins collection labelled "*Megalomostoma funiculatum* Benson, ?Paratype, Darjiling", with a label in Benson's handwriting that reads "*Megalomostoma funiculatum* Bens, Sikkim Himalaya")
Original measurements: none given
Other material UMZC I.102130 (two shells with opercula from the R. McAndrew collection labelled "*Megalomastoma funiculatum* Bens.", no collection or locality data), UMZC I.102135 (single shell from the R. McAndrew collection accompanied by a label in Hanley's handwriting that reads "figured in *Conch. Indica*, MEGALOMASTOMA funiculatum var BENSON"); NHMUK 1856.9.15.17 (four shells from the T. Hutton collection labelled "*Cyclostoma funiculatum*, Darjeeling")
Type locality India: "Himálaya"
Remarks The number of specimens examined was not noted in Benson's original description. UMZC I.102135 was figured by Hanley and Theobald (1875 [in 1870–1876]) as "*Megalomastoma funiculatum* var.", the varietal suffix presumably relating to the fact that this specimen is broader and less slender (19.6 mm x 8.9 mm) than the specimen figured by Sowerby (1850, pl. 31b, figs 316, 317), although this does not provide grounds for doubting the status of the specimen as part of Benson's type series. Benson (1852c: 272) later published details of a series of specimens from Darjiling at various stages of growth provided by Robert Trotter. Gude (1921: Fig. 25) illustrated a specimen from the NHM, presumably the single specimen from the Khasi Hills in the Cuming collection. The specimens that form NHMUK 1954.6.2.1230 were sent to Hawkins by Benson in 1859 [Z_MSS_HAW, Benson to Hawkins 23rd Feb. 1859]. There has been confusion about the authorship

of this species and about the spelling of the species name. The rather brief original description was contained in the paper by Hutton and Benson (1838) in a paragraph attributed to Benson, so authorship is here assigned to him. Gude (1921: 169) considered that Benson's description was an inadequate diagnosis and regarded *Cyclostoma funiculalum* a *nomen nudum*. He consequently assigned authorship to Sowerby (1850), who provided a more complete description based on material from the Benson and Cuming collections, apparently from the "Khasya Hills", the only locality mentioned. However, despite its brevity, Benson's description, which compares the modern Indian species with a European Tertiary fossil (now *Dissostoma mumia*), fulfils the criteria for availability. Sowerby (1850) changed the spelling of the species name to '*funiculatum*', a lead followed by subsequent authors including Benson (1859k), but this is an unjustified emendation (ICZN, Art. 32.2, 32.3). It is noteworthy that all the specimens of this species in the UMZC are from Darjiling, which is consistent with their having been collected by Dr Chapman, mentioned in the original paper, who was attached to the Darjiling Sanitarium and who collected material for Benson. One of these (UMZC I.102140.A) is here selected as the lectotype. Benson (1859k) published a preliminary report noting differences in the operculum of this species to other species of '*Megalomastoma*'. Gude (1921) repeated Sowerby's (1850) record of *funiculalum* from India (Khasi Hills). Specimens from Nepal have been attributed to this species although they possess a white, rather than an orange, peristome (Budha et al., 2015). It has also recently been recorded from Bhutan (Gittenberger et al., 2017a, 2019b). Chinh and Páll-Gergely (2020: 448) restored the genus *Coptocheilus* Gould, 1862, relegating the unnecessary replacement name *Schistoloma* Kobelt, 1902.

Genus *Tortulosa* Gray, 1847

Subgenus *Eucataulus* Kobelt, 1902

Tortulosa (*Eucataulus*) *austeniana* (Benson, 1853)

Cataulus austenianus Benson, 1853c: 95; Pfeiffer, 1854a: 89; 1858: 88; Hanley and Theobald, 1874 [in 1870–1876]: 43, Pl. 106, Fig. 7; Reeve and Sowerby, 1876 [in 1875–1878], 20 (Pupinidae): Pl. 7, Fig. 59; Kobelt and Möllendorff, 1897: 143
Cataulus austenianus Pfeiffer; Nevill, 1878: 297
Tortulosa (*Eucataulus*) *austeniana* (Benson); Kobelt, 1902: 282; Gude, 1921: 174
Type material a neotype (NHMUK 1912.8.16.310, **Fig. 37 C**) is hereby designated from a series of three shells from the collection of Edgar Layard labelled "*Cataulus austeniana* Bens. Ceylon"; written on the bottom of the box, possibly in Layard's handwriting, is "*austeniana* Bens. Ceylon". We have designated a neotype with the express purpose of clarifying the taxonomic status of *C. austenianus* (see below).
Original measurements: "Diam. 13½, alt. 25 mill."
Other material UMZC I.103985.A (four shells in the R. McAndrew collection labelled "*Cautulus* [sic] *Austeniana* Benson, Ceylon"); BRSMG Aa.606/O.C.2485 (single shell presented by F. Layard labelled "*Tortulosa austeniana* Benson, Ceylon")
Type locality Sri Lanka: "Hab. ad Heneratgodde in rimis saxorum" [lives at Heneratgodde in the cracks of rocks]
Remarks Benson (1853c: 95) based his description on more than one specimen collected by Edgar Layard: "In some specimens the last whorl is more swollen than in others." The four shells in the UMZC are not labelled as coming from the Benson collection, although this is likely. They are a mixture of two species: two are *Tortulosa austeniana*, the other two are *T. pyramidata* (L. Pfeiffer). The two *T. austeniana* are therefore probably syntypes, since they agree with Benson's description, but this cannot be established unequivocally. Because of these issues we have designated a neotype using material collected by Edgar Layard.

Tortulosa (*Eucataulus*) *decora* (Benson, 1853)

Cataulus decorus Benson, 1853c: 96; Pfeiffer, 1854a: 90; 1858: 89; Hanley and Theobald, 1874 [in 1870–1876]: 43, Pl. 106, Fig. 5; Reeve and Sowerby, 1876 [in 1875–1878], 20 (Pupinidae): Pl. 7, Fig. 64; Nevill, 1878: 298; Kobelt and Möllendorff, 1897: 143
Tortulosa (*Eucataulus*) *decora* (Benson); Kobelt, 1902: 284; Gude, 1921: 179
Type material a neotype (NHMUK 1912.8.16.307, **Fig. 37 A**) is hereby designated from a series of three shells from the Edgar Layard collection labelled "*Cataulus decorus* Bens., Ceylon"). We have designated a neotype with the express purpose of clarifying the taxonomic status of *C. decorus* (see below).
Original measurements: "Diam. vix 10, axis 21 mill."
Other material UMZC I.103942, **Fig 37 B** (single shell from the R. McAndrew collection labelled "*Cataulus decorus*, figured in Conch. Indica pl. 106 f. 5" and with the word "Kando[..k.?]" written on the shell); UMZC I.103940 (four shells, one with operculum, from the R. McAndrew collection labelled "*Tortulosa Decora* Benson, Bens. col., Ceylon"), NHMUK 1954.6.2.1241–2142 (two shells from the J.S. Hawkins collection labelled "*Cataulus decorus* Benson, ?Paratype, Ahurambodde, Ceylon, F. Layard 1862"); BRSMG Aa.607/O.C. 2484 (two specimens presented

by F. Layard labelled "*Tortulosa decora* Bens., Ceylon")
Type locality Sri Lanka: "Hab. ad Ratnapoora" [lives at Ratnapoora]
Remarks Possibly only one specimen was sent to Benson for description, as [Edgar] Layard wrote, "This was found under a rock with two others; animal brownish gray, foot livid. Tentacles pale orange, two; eyes sessile, two, black" (quoted in Benson 1853c: 96). Because Benson referred to all three of Layard's specimens, they can all be considered part of the type series. However, the subsequent histories of both the Benson and Layard collections are unclear. The smallest of the three NHM shells (NHMUK 1912.8.16.307) is most similar in size to the measurements given by Benson. The name *decorus* has become associated with the shell illustrated by Sowerby (*Thes. Conch*. 1866, Pl. 264, Fig. 13). Shells similar to this occur in the vicinity of the type locality of Benson's *decorus* (i.e. Ratnapoora) and these shells and Sowerby's figure agree with Benson's description. However, Benson's description could equally apply to several different Sri Lankan species (e.g. *nevilli* Sykes and *colletti* Sykes) but the following points suggest that his *decorus* from Ratnapura is conspecific with the species illustrated by Sowerby: (a) the prominent basal carina and (b) the wide, prominent opening of the basal carina on the lip. The lots from the UMZC have been mislabelled as *decorus*; they are in fact *colletti* Sykes. The figures of Reeve (Reeve and Sowerby, 1876 [in 1875–1878] and Hanley and Theobald (1874 [in 1870–1876]) are similar to Sowerby's figure but none of these authors indicated that the shell illustrated was a Benson specimen. *Cataulus decorus* is a Sri Lankan endemic.

Genus *Pollicaria* A.A. Gould, 1856 [10]

Pollicaria gravida (Benson, 1856)

Megalomastoma gravidum Benson, 1856e: 229; Theobald, 1857: 247; Pfeiffer, 1858: 79; Pfeiffer, 1865: 56; Hanley and Theobald, 1870 [in 1870–1876]: 4, Pl. 7, Fig. 1
Hybocystis gravida (Benson); Benson, 1859j: 91; Nevill, 1878: 298; Cooke, 1895: 305, Fig. 205; Kobelt and Möllendorff, 1899: 137
Otopoma blennus Benson, 1856; Benson, 1859j: 91
Pollicaria gravida (Benson); Sowerby, 1864 [in 1842–1887], Pl. 263, Fig. 5; Stoliczka, 1871: 150; Reeve and Sowerby, 1876 [in 1875–1878], 20 (Pupinidae): Pl. 8, Fig. 68; Kobelt, 1902: 289, Fig. 65; Gude, 1921: 191, Fig. 29; Kongim et al., 2013: 26, Fig. 4A–E
Type material a neotype (NHMUK 1888.12.4.863, **Fig. 37 E**) is here designated from a series of three shells in the W. Theobald collection labelled "*Hybocystis gravida* Bens, *Otopoma blennus* B = juv., Farm Caves, Moulmein, F.B.I. Fig. 29"). We have designated a neotype with the express purpose of clarifying the taxonomic status of *M. gravidum* (see below).
Original measurements: "Long. 35 mill., diam. anfr. penult. 20 mill."
Other material UMZC I.102935.A, **Fig. 37 F** (one of seven shells from the R. McAndrew collection, invalidly designated as the lectotype by Kongim et al. (2013: 26), labelled "*Hybocystis Gravida* Bens., Bens. col., India"); NHMUK 1954.6.2.1231–1232 (two shells from the J.S. Hawkins collection labelled "*Hybocystis gravida* Benson, ?Type, Moulmein, Burma"); NHMUK 20191091 (two shells with opercula from the S. Zuckerman collection labelled "*gravida*, Burma, Theobald Colln."); 20191092 (two shells, one adult with operculum and one juvenile, from the E.R. Sykes collection labelled "*gravida* Bens., 'India', Linter"); EXEMS: 1720/1909/D40/144/2–8 (seven shells from the J.E. Linter collection labelled "*Hybocystis gravida* Ben., "India", W. T." [William Theobald]); BRSMG Aa.1902/O.C. 2849 (three shells presented by W. Theobald labelled "*Hybocystis grandis* Benson, Maulmein")
Type locality Burma: "Hab. ad Moulmein" [lives at Moulmein]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description: "The specimens received are weathered, and may possibly, in a perfect state, exhibit an epidermis and more colour. The operculum is, unfortunately, not forthcoming". He later mentioned "two specimens of *M. gravidum*, each with the operculum intact" provided by Capt. Haughton (Benson, 1859j: 91). Since the UMZC specimens all have opercula they cannot form part of the type series and thus the designation of UMZC I.102935.A as the lectotype is invalid. One specimen has a sticker attached with "letotype [sic]" written on it and appears to be the adult specimen figured by Cooke (1895: 305, Fig. 205). The specimens from the Hawkins collection (NHMUK 1954.6.2.1231–1232) originated from Robert Gordon (see correspondence, ZOO_MSS_HAW) and are therefore not part of the type series. Several lots in the NHM that were formerly in William Theobald's collection. NHMUK 1888.12.4.863–865 comprises three specimens collected by Theobald from the type locality, and we therefore designate one of these as the neotype. Two other NHM lots (NHMUK 20191091 and 20191092 are labelled as having come from Theobald, although the circumstances in which they were obtained are unclear. Seven ex-Theobald shells are also present in

the J.E. Linter collection in the RAMM. *Hybocystis* Benson, 1859 is a junior subjective synonym of *Pollicaria* Gould, 1856, the type species of which, *Cyclostoma pollex* Gould, 1856 [October], is a junior subjective synonym of *Megalomastoma gravidum* Benson, 1856 [March].

***Otopoma blennus* Benson, 1856**

Accepted as *Pollicaria gravida* (Benson, 1856);
Megalomastoma gravidum Benson, 1856e: 229

Otopoma blennus Benson, 1856e: 231; Theobald, 1857: 248; Pfeiffer, 1858: 111
Type material UMZC I.102930.A–B, **Fig. 37 D** (one of two syntypes from the R. McAndrew collection labelled "*Hybocystis Gravida* Juv., *Otopoma Blennus* Bens., Bens. col.", no locality data)
Original measurements: "Diam. major 18, minor 15, alt 18½, axis 13 ½ mill. Apert. 10½ mill. longa."
Type locality Burma: "Hab. raro ad Moulmein" [lives rarely, at Moulmein]
Remarks Benson (1859j) made further observations of the shell and animal of "*Hybocystis Gravida*" and "*Otopoma Blennus*" from Moulmein, originally found there by Theobald, leading him to conclude that they were juveniles and adults of a single species (*Pollicaria gravida*), a view endorsed by Cooke (1895: 305, Fig. 205), Gude (1921: 191) and Kongim et al. (2013: 26, Fig. 4C).

Superfamily VIVIPAROIDEA

Family VIVIPARIDAE

Subfamily BELLAMYINAE

Genus *Angulyagra* Rao, 1931 [11]

***Angulyagra oxytropis* (Benson, 1836)**

Paludina oxytropis Benson, 1836b: 745; Reeve, 1863 [in 1862–1864], 14 (*Paludina*): pl. 2, species 9; Nevill, 1885: 22
Paludina pyramidata Philippi; Hanley and Theobald, 1873 [in 1870–1876]: 32, Pl. 76, Fig. 5
Vivipara oxytropis (Benson); Preston, 1915: 84; Annandale et al., 1921: 548
Dactylochlamys oxytropis (Benson); Rao, 1925: 132
Angulyagra oxytropis (Benson); Rao, 1931: 301; Subba Rao, 1989: 51; Ramakrishna and Dey, 2007: 94, Fig. 54
Type material NHMUK 1879.12.26.120, **Fig. 38 A** (holotype transferred from the India Museum labelled "*Paludina oxytropis* Benson, Bengal")
Original measurements: "Long. 1.7 poll. Lat. 1.3"
Other material NHMUK 20190430 (single shell from the Cuming collection labelled "*Paludina oxytropis* Benson, Silhet, Dr Cantor); NHMUK 20190431 (two shells labelled "*Vivipara oxytropis* Benson. Donor Manipur Survey (ex Indian Museum), Loc. Loktak Lake, Manipur, Assam")
Type locality Bangladesh: part of a collection "chiefly made in the hills on the N.E. Frontier of Bengal".
Remarks Benson based his original description on a single specimen in the Museum of the Asiatic Society, although he was aware of others that he apparently did not examine at the time: "Some of the specimens are, I believe, much larger than the one described". NHMUK 1879.12.26.120 was transferred to the BM from the EIC's India Museum, which had received its specimens from the Asiatic Society Museum. Nevill (1885: 22) did not list any further specimens originating from the Asiatic Society collection in the Indian Museum. This species is listed in Robert McAndrew's *Catalogue* but no specimens from the Benson collection could be found in the UMZC. *Paludina oxytropis* is the type species of *Angulyagra* Rao, 1931 by typification of a replaced name. Two phases of *Angulyagra oxytropis* have been recognised by Annandale (1921), namely the typical phase occurring in Loktak Lake, Manipur, and a pond phase approaching *A. microchaetophora.* The species is widely distributed in southern and eastern Asia and has been identified from Burma, Malaysia, Indonesia (Java, Sulawesi, and Sumatra), Philippines, China and Japan (Ramakrishna and Dey, 2007).

Genus *Bellamya* Jousseaume, 1886

***Bellamya bengalensis balteata* (Benson, 1836)**

Paludina bengalensis var. *balteata* Benson, 1836: 745; Preston, 1915: 83
Paludina bengalensis subvar. *balteata* Benson; Nevill, 1885: 21
Vivipara bengalensis race *balteata* Benson; Annandale, 1921: 273
Bellamya bengalensis form *balteata* Benson: Subba Rao, 1989: 46, Fig. 63; Ramakrishna and Dey, 2007: 81, Fig. 41
Type material not located
Original measurements: none given
Other material NHMUK 20200357 (three specimens from the Hugh Cuming collection labelled "*P. bengalensis* var., Moradabad. Mr Benson")
Type locality India: Silcuri, Cachur, Assam
Remarks Benson based his original description on an unknown number of specimens in the Museum of the Asiatic Society, although no specimens from that collection were listed under this name by Nevill (1885: 21). Blanford (1869: 445) suggested that Benson's var. *balteata* might be synonymous with *Paludina doliaris* Gould. The NHM specimens were apparently given to

Cuming by Benson but they are not clearly labelled as his var. *balteata*. According to Ramakrishna and Dey (2007) this form has been identified from Assam, Meghalaya, Garo Hills, Ri-Bhoi, and West Bengal, Darjeeling. Rao (1928: 416) also reported this variety of *V. bengalensis* from Burma.

Genus *Cipangopaludina* Hannibal, 1912

Cipangopaludina lecythis (Benson, 1836)

Paludina lecythis Benson, 1836b: 745; Hanley and Theobald, 1873 [in 1870–1876]: 32, Pl. 76, Fig. 6
Paludina chinensis var *lecythis* Benson; Nevill, 1885: 20
Vivipara lecythis (Benson); Preston, 1915: 90
Lecythoconcha lecythis (Benson); Annandale, 1920b: 114; Annandale in Annandale et al., 1921: 553
Cipangopaludina chinensis lecythis (Benson); Prashad, 1928a: 168
Cipangopaludina lecythis (Benson); Yen, 1943; 127; Subba Rao, 1989: 50; Ramakrishna and Dey, 2007: 95, Fig. 55; Lu et al., 2014: 519
Type material NZSI M.2300, **Fig. 38 C** (one of three syntypes labelled "*Paludina lecythis* Benson, Sylhet, Assam, Types")
Original measurements: "Long. 2 poll. Lat. 1.7"
Other material UMZC I.102210, **Fig. 38 D** (single shell from the R. McAndrew collection labelled "*Paludina Lecythis* Bens., Bens. col., Sylhat"); UMZC I.102205 (single shell from the R. McAndrew collection labelled "*Paludina Lecythis* Var Bens., Bens. col.", no locality data); NHMUK 20190432 (single shell labelled "*Vivipara lecythis* Benson, Loc. Loktak Lake, Manipur, Assam, Donor Manipur Survey")
Type locality Bangladesh: part of a collection "chiefly made in the hills on the N.E. Frontier of Bengal".
Remarks The number of specimens examined was not stated in Benson's original description, which was based on material in the collection of the Asiatic Society; the specimens from the Benson collection in Cambridge are therefore not considered to be part of the type series. Nevill (1885: 20) listed three specimens in the Indian Museum from "Sylhet, types of *P. lecythis*; ex c. As. Soc. Bengal". These are probably the three specimens in the ZSI (NZSI M.2300), although the labels no longer record the source of this material. Benson stated that the type series included adult and juvenile specimens: "The epidermis is greenish olive in young specimens, reddish fuscous in the adult." Annandale (in Annandale et al., 1921: 555; 1924: 413) noted that the "type-specimens" from the Asiatic Society's collection were labelled as being from "Sylhet". However, since they agreed so closely with shells from the more open part of Loktak Lake in Manipur, he doubted that "Sylhet" was the correct locality, especially since this species was otherwise unknown from there. He pointed out that at the time when the Asiatic Society's collection was made Sylhet was on the route to Manipur. Annandale (1920b) had previously proposed *Lecythoconcha* as a distinct genus for *Paludina lecythis* but Prashad (1928a) argued that this name was invalid and assigned this species to *Cipangopaludina*, but regarded *lecythis* as a subspecies of *Cipangopaludina chinensis* (Gray in Griffith and Pidgeon, 1833), a view previously held by Nevill (1885). Lu et al. (2014), however, upheld its validity, highlighting the distinctive shape of the aperture. They also regarded *C. ampulliformis* (Souleyet, 1852) as a synonym of *C. lecythis* and *C. ampullacea* (Charpentier, 1863) as a subspecies.

Cipangopaludina lecythoides (Benson, 1842)

Paludina lecythoides Benson, 1842b: 488; Reeve, 1863 [in 1862–1864], 14 (*Paludina*): pl. 4, species 21
Cipangopaludina chinensis lecythoides (Benson); Prashad, 1928a: 168
Viviparus chinensis lecythoides (Benson); Yen, 1942: 190
Cipangopaludina lecythoides (Benson); Yen, 1943: 127; Lu et al., 2014: 519, Fig. 1J
Type material NZSI M.2332, **Fig. 38 E** (three syntypes, one of which was designated as the lectotype by Annandale (1924: 414) labelled "*Paludina lecythoides* Benson, Chusan, Dr Cantor"; inside the mouth of the lectotype is written "Chusan, AS" [Asiatic Society]); OUMNH.ZC.MO25562 (paralectotype from the T. Cantor collection labelled "8. *Paludina lecythoides*"); NHMUK 1842.9.30.47, **Fig. 38 F** (one of two paralectotypes presented by the Hon. East India Company labelled "*Paludina lecythoides* Cantor, ditches & ponds in Chusan")
Original measurements: none given
Type locality China: Chusan. "Ditches and ponds"
Remarks Benson (1842b) did not state the number of specimens collected by Cantor and used for the original description, but later noted that this species was "not numerous" at Chusan (Benson, 1855a: 130). Nevill (1885: 19), who regarded this species as a synonym of *Paludina chinensis*, mentioned three shells labelled "Chusan (typical *P. lecythoides*); ex c. As. Soc. Bengal (coll. Dr. Cantor)" in the collection of the Indian Museum. These are presumably the shells that form NZSI M.2332. Annandale (1924: 414) selected one of these (measuring 43.5 mm x 33.5 mm) as the lectotype. Some authors (e.g. Prashad, 1928a) have regarded this taxon as a form or subspecies of *Cipangopaludina chinensis* (Gray, 1834). Lu et al. (2014), who have recently provided a review of *Cipangopaludina* in China, questioned the validity of *C. lecythoides*,

pointing out the difficulty in distinguishing it from *C. cathayensis* on shell characters alone. However, were these two taxa shown to be conspecific, *lecythoides* Benson, 1842 would have priority over *cathayensis* Heude, 1890.

Genus *Mekongia* Crosse & P. Fischer, 1876

Mekongia crassa (Benson, 1836)

Paludina crassa Benson, 1836b: 745
Paludina crassa Hutton; Reeve, 1863 [in 1862–1864], 14 (*Paludina*), pl. 6, species 33; Hanley and Theobald, 1873 [in 1870–1876], 32, Pl. 76, Figs 2, 3; Nevill, 1885: 25
Vivipara crassa (Hutton); Preston, 1915: 86
Bellamya crassa (Benson); Subba Rao, 1989: 48; Ramakrishna and Dey, 2007: 89, Fig. 49
Mekongia crassa (Benson); Nesemann et al. (2007)
Type material NHMUK 1954.6.2.720, **Fig. 38 B** (syntype from the J.S. Hawkins collection labelled "*Vivipara crassa* Hutton, Bengal, W.H. Benson Esq. 1862", accompanied by a fragment of tissue paper inscribed with the number "29" in Benson's handwriting and distinctive blue ink, here designated as the lectotype); NHMUK 1841.7.23.18 (syntype transferred from the India Museum labelled "*Paludina crassa* n 20, Himalaya")
Original measurements: "Long. 2 poll. Lat. 1.7"
Type locality Bangladesh: part of a collection "chiefly made in the hills on the N.E. Frontier of Bengal" and also "abundant in the river *Gúmtí* at *Jônpur*".
Remarks Hutton provided a brief description of this species (his 'No. 5 Paludina') found "in the Jegu nullah at Chunar" (Hutton, 1834; 90) but he did not provide a name. Benson (1836b) therefore provided the first valid description of the species, which he attributed to Hutton, based on specimens in the Museum of the Asiatic Society and material from the Gumti river. NHMUK 1841.7.23.18 was transferred to the BM from the EIC's India Museum in London by Dr Thomas Horsfield and is the specimen listed amongst material supplied by the Asiatic Society by Pearson (1840: 729). Nevill (1884: 25) listed a lot of 11 shells labelled "Loc. ? (? typical); ex c. As. Soc. Bengal" in the Indian Museum, which probably represent more of the type series. NHMUK 1954.6.2.720 was given to J.S. Hawkins by Benson in 1862 and is therefore considered to be a syntype. Benson's label bearing the number '29' corresponds with the manuscript list of specimens provided to Hawkins (MSS_ZOO_HAW). *Bellamya crassa* (Benson, 1836) is treated as *Mekongia crassa* by Nesemann et al. (2007).

Genus *Sinotaia* F. Haas, 1939

Sinotaia quadrata (Benson, 1842)

Paludina quadrata Benson, 1842b: 487; Reeve, 1863 [in 1862–1864], 14 (*Paludina*): pl. 4, species 17
Vivipara quadrata (Benson); Annandale, 1924: 408, Pl. 17, Fig. 2
Taia (*Sinotaia*) *quadrata* (Benson); Haas, 1939: 96
Viviparus quadratus (Benson); Yen, 1942: 191
Bellamya quadrata (Benson); Yen, 1943: 126; Gu et al., 2015: 545
Sinotaia quadrata (Benson); Ye et al., 2021: 4 (full synonymy given)
Type material NHMUK 1842.9.30.34–44, **Figs 39 A–B** (two of 11 syntypes presented by the Hon. East India Company labelled "*Paludina quadrata* Cantor, canals & ponds, Island of Chusan"); OUMNH.ZC.MO25561 (eight syntypes, two adult shells and six juveniles, from the T. Cantor collection labelled "7. *Paludina quadrata*"); UMZC I.104690 (two syntypes from the R. McAndrew collection labelled "*Paludina Quadrata* Bens. var, Bens. col.", no locality data); UMZC I.104685 (two syntypes from the R. McAndrew collection labelled "*Paludina Quadrata* Bens. var ? Bens. col."; no locality data); BELUM.Mn124180 (two syntypes labelled "*Paludina quadrata*, Chusan, China, Presented by Dr. Cantor, 1842")
Original measurements: none given
Other material UMZC I.104680 (four shells from the R. McAndrew collection labelled "*Paludina Quadrata* Benson, Whampoa", no collection data)
Type locality China: Chusan
Remarks The number of specimens provided by Theodore Cantor was not noted in Benson's original description, although the species was said to be "Extremely common in canals and fresh-water ponds, where it is found in mud, and adhering to stones, wood, aquatic plants or any firm object which may happen to be immerged" (Benson, 1855a: 129). *Sinotaia quadrata*, the type species of *Sinotaia* F. Haas, 1939, comprises many named forms and transitions between them. Combining morphological and molecular phylogenetic data, Ye et al. (2021) concluded that seven currently recognised species of *Sinotaia* should be synonymised with *S. quadrata*. They also found that genetic and shell shape variations were not congruent, suggesting that differences in shell morphology result primarily from ecophenotypic variation. *Sinotaia quadrata* occurs in lakes, rivers and ditches and is native to China, Japan and Korea.

Cohort SORBEOCONCHA

Subcohort CERITHIIMORPHA

Superfamily CERITHIOIDEA

Family PACHYCHILIDAE

Genus *Brotia* H. Adams, 1866

***Melania variabilis* Benson, 1836**

Accepted as *Brotia costula* (Rafinesque, 1833);
Melania costula Rafinesque, 1833: 166

Species A; Benson, 1830a: 22, Pl. 7, Fig. 7
Melania variabilis Benson, 1836b: 746 (non *M. variabilis* Defrance, 1823); Reeve, 1860 [in 1859–1861], 12 (*Melania*): pl. 31, species 204
Melania (*Melanoides*) *variabilis* Benson; Nevill, 1885: 251
Tiara (*Melanoides*) *variabilis* (Benson); Preston, 1915: 23
Acrostoma variabile (Benson); Annandale, 1920: 109
Acrostoma variabilis (Benson); Annandale et al., 1921: 560
Type material NHMUK 1872.12.2.2, **Fig. 39 C** (lectotype designated by Köhler and Glaubrecht (2002: Fig. 3o), and figured again by Köhler and Glaubrecht (2005: Fig. 17A), presented by Robert McAndrew, accompanied by Benson's original label that reads "*Mel. variabilis* Bens, Type, R. Goomty, Juanpur" and another note that reads "Type of *variabilis* from Benson's coll. wh. was purchased by Mr R. McAndrew & presented by him"); NHMUK 1954.6.2.3, **Fig. 39 E** (one of two paralectotypes from the J.S. Hawkins collection labelled "*Melania variabilis* juv. Bens, Calcutta, W.H. Benson Esq. 1861)
Original measurements: variable: "one individual measured 3.4 inches in length"
Other material UMZC I.102305 (12 shells from the R. McAndrew collection labelled "Juanpore, Ind."); UMZC I.102300 (two shells from the R. McAndrew collection labelled "*Melania spinosa* Benson", no collection or locality data); UMZC I.102295 (single shell from the R. McAndrew collection, no locality data), UMZC I.104765 (single shell from the R. McAndrew collection labelled "*variabilis* var.", no locality data)
Type locality India: Benson (1830a: 22) described Species A as occurring "plentifully on a shelving bank of calctuff-gravel (*bájri*) in the Gumti, at Juanpúr, keeping close to the edge of the water." He also mentioned that he had "received specimens from the waters North East of Ayoodhya (Oude)." Benson (1836b: 746) stated that the species "Inhabits the river *Gúmti* at *Jónpur*, and Tolly's nullah near *Calcutta*." Variety A "Inhabits river *Húghli* at *Calcutta*"
Remarks Benson (1836b: 746) described four varieties (A–D), and mentioned that varieties B, C, and D were in "the *Silhet* collection", presumably that of the Asiatic Society. He stated that he "described the type of the species without a name as species A* in the 13th No. of the *Gleanings in Science*. It was figured as No. 7, in Plate VII. Vol. i." (**Fig. 39 D**). Hanley and Theobald proposed the names var. *varicosa* (1874 [in 1870–1876]: 44, Pl. 109, Fig. 2) and var. *spinosa* (1873 [in 1870–1876]: 32, Pl. 75, Fig. 6) for Benson's var. A and var. B respectively. Nevill (1885: 254) subsequently proposed the name var. *semilaevigata* for Benson's var. D and mentioned that the type series of this form (comprising 15 shells from Cachar and Sylhet) was in the Indian Museum. There is some doubt as to whether UMZC I.102295 or UMZC I.102300 are from the Benson collection as they are not labelled as such. *Melania variabilis* was selected as the type species of *Antimelania* P. Fischer & Crosse, 1892 by subsequent designation of Pilsbry and Bequaert (1927: 300). However, Köhler and Glaubrecht (2001: 295, 2002: 132, 2005: 176) pointed out that since *M. variabilis* is a junior synonym of *Brotia costula* (Rafinesque, 1833), a constituent species of *Brotia* H. Adams, 1866, *Antimelania* must be considered a synonym of *Brotia* (Köhler and Glaubrecht, 2002: 124).

***Brotia* (?) *zonata* (Benson, 1836)**

Melania zonata Benson, 1836b: 747; Reeve, 1860 [in 1859–1861], 12 (*Melania*): pl. 32, species 217; Hanley and Theobald, 1873 [in 1870–1876]: 31, Pl. 71, Fig. 4
Tiara (*Melanella*) *zonata* (Benson); Preston, 1915: 32
Brotia (?) *zonata* (Benson): Köhler and Glaubrecht, 2002; 2006: 232
Type material NHMUK 1841.7.23.23, **Fig. 39 F** (syntype presented by the India Museum labelled "*Melania zonata* Pearson n. 13"); UMZC I.102250 (syntype from the R. McAndrew collection labelled "*Paludomus Zonatus* Bens., Bens. col.", no locality data)
Original measurements: Long. 0.85 poll."
Type locality Bangladesh: part of a collection "chiefly made in the hills on the N.E. Frontier of Bengal"
Remarks The number of specimens examined was not stated in Benson's original description, which was based on material in the collection of the Asiatic Society. NHMUK 1841.7.23.23. was transferred to the BM from the EIC's India Museum in London by Dr Thomas Horsfield and corresponds with the Asiatic Society specimen from the "Sylhet collection" listed by Pearson (1840: 729). Nevill (1884: 272) listed a further seven shells in the Indian Museum labelled "Sylhet [typical]; ex c. Asiatic Soc. Bengal", which are also probably part of the type series. Benson (1836b: 747) probably based his description on more than one specimen as he stated that "It is generally eroded at the

apex." Köhler and Glaubrecht (2002: 152) tentatively attributed this species to *Brotia* based on Benson's description, but were unable to examine any type material. *Melania zonata* von dem Busch (1842) was stated to be a junior synonym by objective homonymy (Köhler and Glaubrecht, 2002).

Brotia terebra **(Benson, 1836)** comb. nov.

Melania terebra Benson, 1836b: 747; Reeve, 1859 [in 1859–1861], 12 (*Melania*): pl. 11, species 59
Tiara (*Melanoides*) *terebra* (Benson); Preston, 1915: 27
Type material UMZC I.102230.A, **Fig. 39 G** (one of two syntypes from the R. McAndrew collection labelled "*Melania Terebra* Bens., Bens. col., Ind."); NHMUK 1841.7.23.29 (syntype presented by Dr T. Horsfield labelled "*Melania* No. 16, Himalaya")
Original measurements: "Long 1.05." [poll.]
Type locality Bangladesh: part of a collection "chiefly made in the hills on the N.E. Frontier of Bengal"
Remarks The number of specimens was not noted in Benson's original description, which was based on material in the collection of the Asiatic Society. NHMUK 1841.7.23.29 was presented to the BM by Dr Thomas Horsfield, curator of the India Museum, amongst a batch of specimens transferred from the Asiatic Society. It is labelled "No. 16", corresponding to the entry in the published list of transferred specimens (Pearson, 1840). Nevill (1878: 264) followed Brot (1875) in believing *M. terebra* Benson, 1836 to be conspecific with *Brotia torquata* (von dem Busch, 1842), listing a lot of ten specimens labelled "Sylhet [types of *M. terebra* Bs.]; ex c. Asiatic Soc., Bengal" in the Indian Museum. These specimens have not been traced. The species belongs to the genus *Brotia* and not as stated by Köhler and Glaubrecht (2006) to the Thiaridae. *Brotia torquata* is believed to come from Java but there is some confusion with regard to the provenance of the lectotype (see Köhler and Glaubrecht, 2006: 222). The specific identity of the Benson specimens remains uncertain pending a revision of *Brotia* from Bengal. *Melania terebra* Benson, 1836 is a junior primary homonym of *Melania terebra* Lesson, 1831 described from Papua New Guinea.

Family PALUDOMIDAE

Subfamily PALUDOMINAE

Genus *Paludomus* Swainson, 1840

Subgenus *Paludomus* Swainson, 1840

Paludomus* (*Paludomus*) *ornata **Benson, 1856**

Paludomus ornata Benson, 1856g: 496; Hanley and Theobald, 1874 [in 1870–1876]: 44, Pl. 108, Fig. 8; Nevill, 1885: 289; Preston, 1915: 41
Paludomus (*Paludomus*) *ornatus* (Benson); Subba Rao, 1989: 115; Ramakrishna and Dey, 2007: 183, Fig. 129
Type material a neotype (NHMUK 1888.12.4.1890, **Fig. 40 A**) is hereby designated from a series of two shells in the W. Theobald collection labelled "*Paludoma ornata* Benson, Pegu"). We have designated a neotype with the express purpose of clarifying the taxonomic status of *P. ornata* (see below).
Original measurements: "Long. 18, diam. 13 mill. Apert. 13 mill. longa, 8 lata."
Type locality Burma: "Pegu"
Original locality "Hab. in regno Burmanico. Teste W. Theobald" [lives in the kingdom of Burma, according to W. Theobald]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. None of the types possessed an operculum. No material from Benson's collection is known to survive. In addition to the Theobald specimen in the NHM, there is a lot in the Museum of Comparative Zoology, Harvard (MCZH 74989), also originating from Theobald. Outside Burma this species occurs in the Brahmaputra valley, Assam (Ramakrishna and Dey, 2007: 184). Benson noted that Swainson's genus name refers to a dwelling place (*domus*) and therefore species names should correctly have a feminine termination (see ICZN Art. 30.1.1).

Paludomus labiosa **Benson, 1856**

Accepted as *Paludomus* (*Paludomus*) *petrosa* (Gould, 1844); *Paludina petrosa* Gould, 1844a: 144

Paludomus labiosa Benson, 1856g: 495; Hanley and Theobald, 1876 [in 1870–1876]: 44, Pl. 108, Fig. 9.
Type material UMZC I.102840.A, **Fig. 40 C** (two of seven syntypes from the R. McAndrew collection labelled "*Paludomus Labiosus* Bens., Bens. col.", no locality data)
Original measurements: "Long. 13, diam. 11 mill. Apert. 10 mill. longa, 7½ lata."
Other material NHMUK 1906.1.1.1075 (two shells from the W.T. Blanford collection labelled "*labiosus* Ben., from his types, Aracan"); NHMUK 1888.12.4.1892, **Fig. 40 D** (one of two shells from the W. Theobald collection labelled "*Paludomus labiosa* Benson, Tenasserim R., Type locality"); NHMUK 1907.12.30.77 (single shell from the S. Hanley collection labelled "*Paludomus labiosus* Benson,

figured in Conch. Ind. pl. 108, f.9, from Hanley coll., Birmah")
Type locality Burma: "in rivulis vallis Tenasserim. Teste W. Theobald" [In streams in the Tenasserim Valley, according to W. Theobald]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. The NHM specimens from the Blanford collection are from "Aracan", which is not compatible with the type locality given by Benson; they are therefore not considered syntypes despite the assertion that they came from Benson's type series. Nevill (1885: 291) and Preston (1915: 43) listed this as a synonym of *Paludomus petrosa* (Gould, 1844) described from Tavoy (= Dawei, Burma).

Paludomus (*Paludomus*) *regulata* Benson, 1856

Paludomus regulata Benson, 1856g: 496; Hanley and Theobald, 1874 [in 1870–1876]: 44, Pl. 108, Fig. 5; Nevill, 1885: 290; Preston, 1915: 42; Subba Rao, 1989: 118; Ramakrishna and Dey, 2007: 185, Fig. 131
Type material UMZC I.102900.A, **Fig. 40 E** (one of two syntypes from the R. McAndrew collection labelled "*Paludomus regolatus*, Bens. Col., Burmah")
Original measurements: "Long. 19–24, diam. 12–14 mill. Long. apert. majoris 13, lat. 9 mill."
Other material NHMUK 1888.12.4.1878, **Fig. 40 F** (single shell from the W. Theobald collection labelled "*Paludomus regulata* Benson (Typical), Thyet Myo (plains)"); NHMUK 20200358 (single shell from the S. Hanley collection labelled "*regulata* var. B^{n}., from Theobald")
Type locality Burma: "ad Thyet-Myo Burmanorum" [at Thyet-Myo, Burma]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description, although at least two must have been involved because measurement ranges were given. Nevill (1884: 290) listed five shells labelled "Thyet Myo; ex c. Asiat. Soc., Bengal [coll. W. Theobald Esq.]" in the Indian Museum, although these are not considered part of Benson's type series. According to Ramakrishna and Dey (2007: 186) this species also occurs in India, where it has been identified from Meghalaya, Garo Hills (South) and Khasi Hills (East), and from Mizoram, West Bengal.

Paludomus (*Paludomus*) *stephanus* (Benson, 1836)

Melania stephanus Benson, 1836b: 747
Paludomus stephanus (Benson); Reeve, 1847 [in 1846–1848], 4 (*Paludomus*): pl. 2, species 11; Hanley and Theobald, 1875 [in 1870–1876]: 50, Pl. 122, Fig. 10; Nevill, 1885: 297; Preston, 1915: 44; Subba Rao, 1989: 117; Ramakrishna and Dey, 2007: 188, Fig. 134
Type material NHMUK 1841.7.23.30, **Fig. 40 B** (syntype presented by Dr T. Horsfield labelled "*stephanus* Benson, Himalaya" with the number 12 inscribed on the shell. This specimen is here designated as the lectotype)
Original measurements: none given
Other material UMZC I.102270 (two shells from the R. McAndrew collection labelled "*Melania Stephanos* Bens., Bens. col., Sylhet"); NHMUK 1907.12.30.91 (single shell labelled "*Paludomus stephanus* Bens., Fig^{d} in Conch. Indica Pl. CXXII, f.10, from Hanley Coll., Bengal")
Type locality Bangladesh: part of a collection "chiefly made in the hills on the N.E. Frontier of Bengal".
Remarks Benson (1836b: 747) based his description on several shells in the Museum of the Asiatic Society: "Among the numerous specimens which I had an opportunity of inspecting, only a single individual was perfect." NHMUK 1841.7.23.30 was transferred from the Asiatic Society Museum to the India Museum in 1841 and the number 12 corresponds with the entry for *Melania stephanus* in Pearson's (1840) list. Nevill (1884: 297) listed a further lot of 11 shells labelled "Sylhet [types]; ex c. As. Soc. Bengal" in the Indian Museum, which presumably also represents part of the type series. Theobald (1876a: 53) provided an amended locality for NHMUK 1907.12.30.91 of "Khasi hills (Teria ghât)", also noting that "Sylhet district" was located "at the base of the Khasi hills" (Theobald, 1876a: 1). Neiber and Glaubrecht (2019) figured what they regarded as a "probable syntype" from "Sylhet" in the Museum of Comparative Zoology, Harvard (MCZH 89555) but there does not appear to be any documentation linking this shell to the Asiatic Society. The two shells in lot UMZC I.102270 are not *Melania stephanus*, despite the label, because they lack the coronate shoulder spines mentioned in the original description. They instead conform to the description of *Melania conica* Gray, 1833 in Griffith and Pidgeon (1833–1834), but that taxon was said to come from Ceylon. It seems that subsequent authors followed Benson in regarding the taxon from NE India as *M. conica* but the status of that species is uncertain and the name is preoccupied by *M. conica* Say, 1821. Moreover, the type of *M. conica* Gray, 1833 could not be found in the NHM in 2006 (see Petit and Coan, 2008: 234).

Subgenus *Odontochasma* Tomlin, 1930

Paludomus (*Odontochasma*) *stomatodon* (Benson, 1862)

Tanalia (?) *stomatodon* Benson, 1862a: 414 (with unnumbered in-text figure)
Paludomus (*Stomatodon*) *stomatodon* (Benson); Hanley and Theobald, 1874 [in 1870–1876]: 44, Pl. 108, Fig. 1; Nevill, 1885: 305; Preston, 1915: 64; Subba Rao, 1989: 122
Paludomus (*Odontochasma*) *stomatodon* (Benson); Wenz, 1938–1944: 704; Neiber and Glaubrecht, 2019: 336
Type material UMZC I.103250.A, **Fig. 41 A** (one of four syntypes from the McAndrew collection labelled "*Panystoma Stomaloleon* [sic] Bens., Bens. col., Ind.")
Original measurements: 'Axis 14, lat. 12 mill."
Other material NHMUK 1872.7.10.4, **Fig. 41 B** (one of two shells, one adult and one juvenile, presented by Robert McAndrew labelled "*Odontochasma stomatodon* Bs., Travancore, R. McAndrew Esq." with another label stating "*bensoni* Brot.")
Type locality India: "in aquis dulcibus montium prope Cottyam, regionis Travancoriae. Invenit D. Kohlhoff" [In the freshwater mountain streams near Kottyam, Travancore region. Found by D. Kohlhoff]
Remarks Benson (1862a: 414) based his description on more than one specimen: "Unfortunately, all the specimens were deficient in the operculum ..." This species is the type species of the subgenus *Stomatodon* Benson, 1862 but this is preoccupied by Seeley's use of that name in 1861 for a fossil from the Cambridgeshire Greensand; Tomlin (1930: 23) therefore proposed the replacement name *Odontochasma*. Neiber and Glaubrecht (2019) revised the description of *Paludomus* (*Odontochasma*) *stomatodon* and illustrated its radula, which had an extraordinary number of denticles on the outer marginal teeth. They included *Stomatodon bensoni* Brot, 1880 in the synonymy of *P.* (*O*). *stomatodon* and listed possible syntypes of these two taxa in various institutions. This species is endemic to the Western Ghats, where in addition to its occurrence at Kottayam, now in Kerala, it has been identified from Malabar, Karnataka and Tamil Nadu (Neiber and Glaubrecht, 2019).

Family SEMISULCOSPIRIDAE [12]

Genus *Semisulcospira* O. Boettger, 1886

Semisulcospira cancellata (Benson, 1842)

Melania cancellata Benson, 1842b: 488 (non Say, 1829); Nevill, 1885: 263
Melania bensoni Reeve, 1859 [in 1859–1861], 12 (*Melania*): pl. 14, species 96
Semisulcospira cancellata (Benson); Annandale, 1924: 33
Type material NHMUK 20190436/1, **Fig. 41 C** (one of five syntypes labelled "*cancellata* Benson, Chusan, H.E.I. Company"); OUMNH.ZC.MO25560 (three syntypes from the Cantor collection labelled "Chusan")
Original measurements: "Axis 1.0 poll. v. paulo plus" [perhaps a little more]
Type locality China: Chusan: "canals"
Remarks The number of specimens provided by Theodore Cantor was not noted in Benson's original description. Nearly all adult shells from Chusan were "somewhat mutilated" and often lacked the apex (Benson, 1855a: 132). The specimens that form NHMUK 20190436 are likely to be the five shells presented by the Hon. East India Company labelled "*Melania cancellata* Cantor, canals, Island of Chusan" and registered as NHMUK 1842.9.30.29–33, although the original registration number has been lost. Nevill (1885: 263) and Annandale (1924: 33) mentioned that the Indian Museum had three shells collected by Cantor from "Chusan", which are also possible syntypes; these specimens are presumably now in the ZSI. This widely distributed species was attributed to the genus *Semisulcospira* Boettger by Annandale (1924), who illustrated the operculum and radula.

Melania crebricostis Benson, 1842

Melania (*Hemisinus* ? Swainson) *crebricostis* Benson, 1842b: 488
Melania (*Melanoides*) *crebricostis* Benson; Nevill, 1885: 263
Type material not located
Original measurements: "Axis testae decollatae 1.05 poll."
Type locality China: Chusan: "canals"
Remarks Tryon (1871: 280) tentatively suggested that this is a synonym of *Semisulcospira cancellata* (Benson), with which it occurred as a scarce associate.

Family THIARIDAE

Subfamily THIARINAE

Genus *Tarebia* H. Adams & A. Adams, 1854

Melania lirata Benson, 1837

Accepted as *Tarebia lineata* (Gray, 1828); *Helix lineata* Gray in Wood 1828: 24, Fig. 68

Species D; Benson, 1830a: 22
Melania lirata Benson, 1837a: 782
Type material UMZC I.102265.A, **Fig. 41 D** (one of 12 syntypes from the R. McAndrew collection labelled "*Tarebia Lirata* Bens., Bens. col.", no locality data);

UMZC I.102260 (two syntypes from the R. McAndrew collection labelled "*Tarebia Lirata* Var Bens., Bens. col.", no locality data); NHMUK 1954.6.2.30 (syntype from the J.S. Hawkins collection labelled "*Melania lirata* Benson, Paratype, Calcutta, W.H. Benson 1862")
Original measurements: none given
Other material UMZC I.102255 (single shell from the R. McAndrew collection labelled "*Tarebia Lirata* Benson", no collection or locality data); NHMUK 1954.6.2.25–29 (five shells from the J.S. Hawkins collection labelled "*Melania lirata* Benson, ?Paratypes, Moulmein")
Type locality India: "It occurs in the Gumti, at Juanpúr"
Remarks The type (or type series) consisted of dead shells: "I have never met with a living specimen of this shell" (Benson, 1830a: 22). The shells from the Hawkins collection (NHMUK 1954.6.2.25–29) was provided by Robert Gordon as part of a collection of specimens from Moulmein (see manuscript list, MSS_ZOO_HAW) and these are not part of the type series despite the claim on the label. *Melania lirata* is now regarded as a synonym of *Tarebia lineata* (Gray, 1828) (Nevill, 1885: 276; Preston, 1915: 34), which has a wide distribution, especially within the Ganges-Brahmaputra basin and thrives in lowland rivers and streams (Subba Rao, 1989).

Genus *Mieniplotia* Low & S.K. Tan, 2014 [13]

Melania elegans Benson, 1837

Accepted as *Mieniplotia scabra* (O.F. Müller, 1774); *Buccinum scabrum* Müller, 1774: 136

Species C; Benson 1830a: 22
Melania elegans Benson, 1837a: 782; Reeve, 1860 [in 1860–1861], 12 (Melania): pl. 26, species 178
Tiara (*Plotia*) *scabra* (O.F. Müller) var *elegans* Benson; Preston, 1915: 36
Mieniplotia scabra (O.F. Müller); Low and Tan, 2014
Type material NHMUK 1872.12.2.1, **Fig. 41 E** (syntype presented by Robert McAndrew labelled "*Melania elegans* Benson, TYPE, R. Gumti, Benson Coll.", accompanied by another label in Benson's handwriting that reads "*Melania elegans* Bens., R. Goomty Sept^{r} 1824, Juanpur, original type")
Original measurements: none given
Other material UMZC I.102225 (five shells from the R. McAndrew collection labelled "*Plotia elegans* Benson", no collection or locality data)
Type locality India: "This species occurs in the Gumti, Betwa and Cén"
Remarks Benson (1830a: 22) based his description on more than one specimen. The provenance of the UMZC shells is unknown but they form part of the McAndrew collection and are likely to have come from the Benson collection. Nevill (1884: 284) listed a lot of eight shells "ex c. Asiatic Soc., Bengal... perhaps typical *M. elegans*, from Benson" in the Indian Museum, which is also potentially part of the type series. This taxon is now recognized as a form of *Mieniplotia scabra* (O.F. Müller, 1774), a species that inhabits streams (and occasionally ponds) throughout most of India. Elsewhere it occurs in many coastal regions of the Indo-Pacific, including various Pacific islands (Subba Rao, 1989).

Genus *Melanoides* Olivier, 1804

Melania pyramis Benson, 1837

Accepted as *Melanoides tuberculata* (O.F. Müller, 1774); *Nerita tuberculata* Müller, 1774: 191

Species B; Benson, 1830a: 22
Melania pyramis Benson, 1837a: 782; Hanley and Theobald, 1874 [in 1870–1876]: 45, Pl. 110, Fig. 3; Reeve, 1859 [1859–1861], 12 (*Melania*): pl. 10, species 51
Tiara (*Striatella*) *pyramis* (Benson); Preston, 1915: 20
Type material UMZC I.103640, **Fig. 41 F** (syntype from the R. McAndrew collection with a label in Hanley's writing that reads "*Melania pyramis* Benson, figured in Conc. Indica pl. 110 f. 3", no locality data)
Original measurements: none given
Other material UMZC I.103635 (eight shells from the R. McAndrew collection labelled "Burmah"); UMZC I.103625 (six shells from the R. McAndrew collection labelled "Ind.")
Type locality India: "This shell occurs alive in the Gumti, Yamuna, Betwa and Cén rivers. I have met with the exuviae in the Ganges"
Remarks The number of specimens was not noted in Benson's original description, which he published in 1830 without naming it. He introduced the name in a footnote published some seven years later (Benson, 1837a: 782). Nevill (1884: 240) mentioned two lots of specimens in the Indian Museum, both labelled "Locality?; ex c. Asiatic Soc., Bengal", which he considered likely to be the original types, although there is no evidence linking them to Benson. *Melania pyramis* Benson 1836 is conspecific with *Melanoides tuberculata* O.F. Müller, 1774 (Brandt, 1974).

Subcohort HYPSOGASTROPODA

Superfamily LITTORINOIDEA

Family POMATIIDAE

Genus *Cyclotopsis* W.T. Blanford, 1864

***Cyclostoma aratum* Benson, 1851**

Accepted as *Cyclotopsis subdiscoidea* (G.B. Sowerby I, 1850); *Cyclostoma subdiscoideum* Sowerby, 1850: vol. 1, 161, pl. 31b, figs 304, 305

Cyclostoma aratum Benson, 1851e: 190
Type material UMZC I.103740.A, **Fig. 42 A** (one of two syntypes from the R. McAndrew collection labelled "*Cyclotopsis Subdiscoidea* Sow. = *Aratus* Bens., Bens. col., Madras")
Original measurements: "Diam. major 18, minor 15, axis 9½ mill."
Type locality India: Indiae Orientalis Provincia "Northern Circars" [Northern Circars Province, East India]
Remarks The number of specimens provided by Thomas Jerdon was not noted in Benson's original description, but more than one was implied. Northern Circars was part of the Madras Presidency that is now a coastal region of Andhra Pradesh and Odisha (Orissa) and is consistent with the given locality "Madras" meaning the Madras Presidency. Gude (1921: 354) listed this species in the synonymy of *Cyclotopsis subdiscoidea* (Sowerby, 1850: 161), for which a neotype has recently been designated by Raheem and Naggs (Raheem et al., 2014: 55, Fig. 31B).

Superfamily NATICOIDEA

Family NATICIDAE

Genus *Laguncula* Benson, 1842

***Laguncula pulchella* Benson, 1842**

Laguncula pulchella Benson, 1842b: 488
Type material NHMUK 1872.7.10.3, **Fig. 42 B** (syntype presented by R. McAndrew labelled "*Laguncula pulchella* Benson, the Type, Chusan (said to inhabit canals)")
Original measurements: none given
Type locality China: Chusan. "Said to inhabit canals"
Remarks The number of specimens provided by Theodore Cantor was not noted in Benson's original description, although the label that accompanies NHMUK 1872.7.10.3 and its register entry that states "Benson's type specimen" suggest that there might only have been one. *Laguncula* was originally placed in Viviparidae but has recently been transferred to Naticidae (Torigoe and Inaba, 2011). This is the type species of *Laguncula* Benson, 1842; *Bensonia* Gray, 1847 and *Scarlatia* Schileyko, 1977 are synonyms.

Superfamily PTEROTRACHEOIDEA

Family ATLANTIDAE

Genus *Oxygyrus* Benson, 1835

***Oxygyrus inflatus* Benson, 1835**

Oxygyrus inflatus Benson 1835b: 176
Type material not located
Original measurements: none given
Type locality Benson first encountered this species in the "Southern Atlantic" (15 to 20˚ 30′ S and between 29˚30′ and 23˚30′ W) but also recorded specimens in the Southern Indian Ocean (39˚ 30′ S and 32˚ E) and at intervals up to the Bay of Bengal (17˚ N, 87˚ E)
Remarks Benson provided co-ordinates for the collecting site from which the described shell was recovered, although he subsequently corrected the given latitude from "29˚30′ S lat." to "39˚30′ S lat." (Benson, 1837c: 316). This species is the type of *Oxygyrus* Benson, 1835 by original designation. Janssen (2012) has shown that *Oxygyrus inflatus* is also the type species of *Helicophlegma* d'Orbigny, 1836 and *Ladas* Cantraine, 1841 based on the misidentification of *Atlanta keraudrenii* Lesueur, 1817 (a junior synonym of *Atlanta peronii* Lesueur, 1817). *Oxygyrus inflatus* was included in a molecular systematic study of planktonic gastropods from different oceans (Jennings et al., 2010). A review of the ecology, palaeontology and distribution of atlantid heteropods has recently been published (Wall-Palmer et al., 2016).

Family CARINARIIDAE

Subfamily CARINARIINAE

Genus *Carinaria* Lamarck, 1801

***Carinaria cithara* Benson, 1835**

Carinaria cithara Benson, 1835c: 215
Type material not located
Original measurements: none given
Type locality Indian Ocean: "between S. Lat. 4˚ 30′, and N. Lat. 4˚ 30′, and E. Long. 87˚ 30′, and W. Long. 90˚ 30′ "]
Remarks Benson based his original description on four specimens "Taken after night-fall" (Benson, 1835c: 215). This species is listed in McAndrew's *Catalogue* but no Benson specimens could be found in the UMZC, and given the fragility of the shells they may not have survived.

Carinaria galea Benson, 1835

Carinaria galea Benson, 1835c: 216
Type material not located
Original measurements: none given
Type locality Indian Ocean: "between S. Lat. 4˚ 30′, and N. Lat. 4˚ 30′, and E. Long. 87˚ 30′, and W. Long. 90˚ 30′ "]
Remarks Benson based his original description on an unknown number of specimens. This species is listed in McAndrew's *Catalogue* but no Benson specimens could be found in the UMZC, and given the fragility of the shells they may not have survived.

"RISSOIFORM CLADE"

Superfamily TRUNCATELLOIDEA

Family ASSIMINEIDAE

Subfamily ASSIMINEINAE

Assiminia fasciata Benson, 1835 [14]

Accepted as *Macrassiminea francesiae* (Wood, 1828)
Turbo Francesii Wood, 1828, 19, Pl. 6, Fig. 28

Assiminia fasciata Benson, 1835d: 463
Assiminea francesiae (Gray in Wood, 1828); Nevill, 1885: 64
Assiminea (? *Cyclotrophis*) *francesiae* (Gray); Annandale and Prashad, 1919: 250, Pl. XX, Fig. 7
Assiminea francessi (Wood); Ramakrishha and Dey, 2007: 148
Micrassiminea francesiae (Wood, 1828); Fukuda and Ponder, 2003: 2016
Material UMZC I.102115.A, **Fig. 42 C** (one of ten shells from the R. McAndrew collection labelled "*Assiminea Francesia* Bens., Bens. col., Calcutta"); UMZC I.102120 (two shells from the R. McAndrew collection labelled "*Assiminea Francesia* Var., Bens. col., Calcutta"); NHMUK 1954.6.2.691–693 (three shells from the J.S. Hawkins collection labelled "*Assiminea francesia* Gray, Calcutta, W.H. Benson 1862"); NHMUK 1841.7.23.11 (single shell transferred from the India Museum labelled "*Assiminea fasciata*, Himalaya, Dr Horsfield")
Original measurements: none given
Type locality India: "on the steps of a Ghaut or landing place, opposise [sic] to Barrackpore" and "on the Ghauts at Calcutta, sixteen miles lower down the river"
Remarks There is confusion regarding both the name and the authorship of this species. When introducing the name *Assiminea fasciata* for what he recognised as the same species as "*Turbo Francesii* Wood 1828", Benson presumably did so because he judged that, lacking a description, Wood's name was invalid. However, although Wood did not provide a description he did use this name to accompany a figure (Wood, 1828: Pl. 6, Fig. 28), making this an available name. Martens (1866) in his review of the Assimineidae listed "*Assiminea Francisci* Gray, Wood" from the estuary of the Ganges. He noted that "a variety with a white spiral band, collected with the type by Lamare Picquot, seems to agree with the specimen I saw some years ago in the Museum of the East India Company, named *Assiminea fasciata* Cantor" (Martens, 1866: 205). This might be a reference to NHMUK 1841.7.23.11. Blanford (1867) mentioned that this species was "well-known" and drew attention to variations in the ending of the species name. Gray (1867) clarified the matter by explaining that this species had been named after his sister and that the correct spelling should therefore be "*francesiae*" (see also discussion in Coan and Petit, 2011: 14). Benson (1835d: 463) found this species adhering to the steps "between high and low water mark within the influence of the tides, and subject to the influx of brackish water in the dry season, the brackishness being only overcome by the strength of the freshes in the rainy season." *Assiminea francesiae* is the type of *Macrassiminea* Thiele, 1927 (see Fukuda and Ponder, 2003: 2016 for a diagnosis).

Subfamily EKADANTINAE

Genus *Acmella* W.T. Blanford, 1869

Acmella tersa (Benson, 1853)

Cyclostoma tersum Benson, 1853d: 285
Cyclostomus? *tersus* (Benson); Pfeiffer, 1854a: 93
Hydrocena tersa (Benson); Benson, 1856e: 232; Pfeiffer, 1858: 158; 1865: 172
Acicula (*Acmella*) *tersa* (Benson); Blanford, 1869a: 178, Pl. xvi, Fig. 2
Acmella tersa (Benson): Blanford, 1870: 370; Theobald and Stoliczka, 1872: 333; Hanley and Theobald, 1874 [in 1870–1876]: 48, Pl. 117, Fig. 1; Nevill, 1878: 251; Kobelt and Möllendorff, 1898: 153; Gude, 1921: 363; Ramakrishna et al., 2010: 112; Das et al., 2021: 325
Georissa tersa (Benson); Pfeiffer, 1876: 292
Type material ZSI/WGRC/I.R–INV.14959, **Fig. 42 D (**neotype designated by Das et al., 2021: 328)
Original measurements: "Diam. 1, long. 2 mill."
Other material NZSI M.30156/7 (single specimen labelled "*Acmella tersa* (Benson), Khasi Hills, Type"); NHMUK 20200359 (three shells labelled (apparently by Nevill) "*Acmella tersa* Bens., Cherra, ex T. Oldham Coll^{n}., ex Indian Museum")
Type locality India: "Hab. in muscis arborum ad Musmai, prope Cherra-poonjee" [lives in tree moss at Musmai, near Cherra-poonjee]

Remarks The number of specimens found by Benson in "moss which had been gathered in the mountain range which fills the eastern angle of the Birhampooter river" was not noted in his original description. No original material could be traced in the McAndrew collection in the UMZC, but a specimen labelled as a "Type" is present in the ZSI (NZSI M.31056/7). The given locality of "Khasi Hills" for this shell is compatible with Benson's type locality, which is in this district; however, there is no definitive link to Benson, who by 1853 had long retired to England, and we therefore do not consider it to be part of the type series. Das et al. (2021) designated a neotype based on newly collected specimens from a cave near Mawsmai. Blanford (1869a: 178) provided an additional description of this species based on specimens collected by Godwin-Austen, together with Godwin-Austen's figures (Pl. xvi, Fig. 2) showing the shell (Fig. 2), operculum (Fig. 2a), details of the head (Fig. 2b) and radula (Fig. 2c). He noted that "the operculum is horny, extremely thin, and very difficult to isolate; it appears to be paucispiral." (Blanford, 1869a: 178). This is the type species of *Acmella* W.T. Blanford, 1870.

Subfamily GARRETTIINAE

Genus *Omphalotropis* L. Pfeiffer, 1851

Omphalotropis distermina Benson, 1863

Omphalotropis distermina Benson, 1863c: 425; Pfeiffer, 1865: 178; Hanley and Theobald, 1876 [in 1870–1876]: 58, Pl. 145, Fig. 10; Nevill, 1878: 321; Gude, 1921: 357; Ramakrishna et al., 2010: 113; Rao et al., 2013: 130

Omphalotropis (*Eurytropis*) *distermina* Benson; Kobelt and Möllendorff, 1898: 149

Type material NHMUK 1888.12.4.2036, **Fig. 42 E** (holotype from the W. Theobald collection labelled "*Omphalotropis distermina* Benson, Andamans")

Original measurements: "Long. 3, diam. 2½ mill."

Type locality Andaman Islands: "Habitat in insulis Andamanicis" [lives on the Andaman Islands]

Remarks Benson based his description on a single specimen, lacking its operculum, provided by William Theobald. This species is endemic to the Andaman Islands (Rao et al., 2013).

Omphalotropis harpula Benson, 1859

Accepted as *Omphalotropis plicosa* (L. Pfeiffer, 1854); *Omphalotropis* (*Eurytropis*) *plicosa* Pfeiffer, 1854c: 61

Omphalotropis harpula Benson, 1859a, 3: 100; Pfeiffer, 1865: 178

Type material UMZC I.104970.A, **Fig. 42 F** (one of three syntypes from the R. McAndrew collection labelled "*Omphalotropis Harpula* Bens., Bens. col., Mauritius")

Original measurements: "Long. 6, diam. 4 mill."

Type locality Mauritius: "Insula Mauritii" [Island of Mauritius]

Remarks The number of specimens examined was not noted in Benson's original description, which did not include the operculum.

Family BITHYNIIDAE

Genus *Bithynia* Leach, 1818

Subgenus *Digoniostoma* Annandale, 1920

Bithynia (*Digoniostoma*) *cerameopoma* (Benson, 1830)

Paludinae; Benson, 1829e: 363

Paludina cerameopoma Benson, 1830c: 125

Bythinia cerameopoma (Benson); Hanley and Theobald, 1870 [in 1870–1876]: 18, Pl. 38, Figs 1, 4; Nevill, 1885: 34

Bithynia cerameopoma (Benson); Preston, 1915: 71; Annandale, 1920a: 43

Digoniostoma cerameopoma (Benson); Subba Rao, 1989: 79

Bithynia (*Digoniostoma*) *cerameopoma* (Benson); Ramakrishna and Dey, 2007: 118, Fig. 72; Glöer and Bössneck, 2013: 147

Type material UMZC I.102180.A, **Fig. 43 A** (one of four syntypes from the R. McAndrew collection labelled "*Bithynea Cerameopoma* Bens., Bens. col.", no locality data)

Original measurements: none given

Other material UMZC I.102175 (three shells from the R. McAndrew collection labelled "*Bithynia Cerameopoma* Bens., Bens. col., Ava"); NHMUK 1856.9.15.12 (12 shells labelled "India, Plains, Captain Hutton")

Type locality India: "a ditch at Banda"

Remarks Seven specimens, collected on 17th September 1829, were described without a name by Benson (1829e: 363). Later, Benson (1830c: 125) named the species and mentioned additional specimens collected in August 1828 and on 5th September 1829. Unfortunately, he did not clarify whether these additional specimens belong to *Paludina cerameopoma* (and thus form part of the type series) or to a different species. Nevill (1885: 34) also listed specimens of "*Bythinia cerameopoma*" from Bengal (ex Asiatic Society) in the Indian Museum. UMZC I.102175 do not come from the type locality and therefore cannot be part of the type series. Preston (1915: 71) provided a

more detailed description of the species based on a specimen in the BM. He also mentioned a second lot of this species in the same institution presented by Capt. T. Hutton and labelled "Plains – India". These specimens were smaller and a darker colour than the other specimen he described. Annandale and Prashad (1921a) described the genus *Digoniostoma* with *Paludina cerameopoma* as its type species. Glöer and Bössneck (2013) provided a key for the identification of bithyniids from Nepal, including *cerameopoma*, *pulchella* and *orcula* (see entries under those species). *Digoniostoma cerameopoma* has quite a wide distribution in India and Pakistan and has recently been reported from Nepal (Glöer and Bössneck, 2013).

Bithynia (*Digoniostoma*) *pulchella* (Benson, 1836)

Paludina pulchella Benson 1836b: 746
Bythinia pulchella (Benson); Hanley and Theobald, 1870 [in 1870–1876]: 18, Pl. 38, Figs 5, 6; Nevill, 1885: 35
Bithynia pulchella (Benson); Preston, 1915: 73; Annandale, 1920a: 43
Digoniostoma pulchellum (Benson); Annandale et al., 1921: 541
Bithynia (*Digoniostoma*) *pulchella* (Benson); Brandt, 1974: 61; Ramakrishna and Dey, 2007: 120, Fig. 74; Glöer and Bössneck, 2013: 147
Digoniostoma pulchella (Benson); Prashad, 1922: 17; Subba Rao, 1989: 80
Type material UMZC I.104985, **Fig. 43 B** (one of seven syntypes from the R. McAndrew collection labelled "*Bithynia Pulchella* Hutton, Bens. col., Ind."); UMZC I.104990 (four syntypes from the R. McAndrew collection labelled "*Bithynia Pulchella* Hutton, Bens. col., Calcutta"); NHMUK 1856.9.15.71 (23 syntypes from the Hutton collection labelled "*Bithynia pulchella*, Plains")
Original measurements: "Long. 0.3 poll."
Type locality Bangladesh: part of a collection "chiefly made in the hills on the N.E. Frontier of Bengal"
Remarks Hutton (1834) provided neither a name nor a description for this species (his 'No. 9 Valvata'), although he recorded that it was found at "Mirzapoor, at the foot of trees, in puddles of water" (Hutton, 1834: 90). Benson (1836b) therefore provided the first description of the species, although he attributed it to Hutton. He also failed to clarify the source of his type series, although Hutton's specimens were clearly collected before he examined the Asiatic Society's "Sylhet collection". Nevill (1885) did not list any ex-Asiatic Society specimens under Benson's name in his *Hand List*, but he had re-named several lots formerly identified as *pulchella* (including two specimens labelled "Morádábád; ex c. As. Soc. Bengal") as *Bithynia subpulchella* (see Nevill, 1881: 157) and these might have been part of Benson's type series. According to Subba Rao (1989) this species occurs throughout India, extending to the plains of Assam in the east and Jammu in the north-west. It also occurs on the Andaman Islands, Burma and the Malay Archipelago. Glöer and Bössneck (2013) provided an identification guide of bithyniids from Nepal, which included *pulchella*, although they noted that Nesemann's (2007) record from Nepal was based on a different species to that reported under this name by Subba Rao (1989).

Genus *Gabbia* Tryon, 1865 [15]

Gabbia longicornis (Benson, 1842)

Paludina (*Bithynia*) *longicornis* Benson, 1842b: 488
Bythinia longicornis (Benson); Nevill, 1885: 39
Parafossarulus longicornis (Benson); Yen, 1942: 198
Alocinma longicornis (Benson); Matsuoka, 1981: 79–85
Type material UMZC I.104440.A, **Fig. 43 C** (one of four syntypes from the R. McAndrew collection labelled "*Paludina Longicornis* Bens., Bens. col., Chusan" (**Fig. 43 D**)); NHMUK 1842.9.30.23, **Fig. 43 E** (one of four syntypes presented by the Hon. East India Company labelled "*Paludina* (*Bithynia*) *longicornis*, in canals on stones &c., Island of Chusan"); OUMNH.ZC.MO25563 (three syntypes from the T. Cantor collection labelled "9. *Paludina longicornis*")
Original measurements: none given
Type locality China: Chusan. "In canals, attached to aquatic plants, stones, piles"
Remarks The number of specimens provided by Cantor was not noted in Benson's original description, although the species was said to occur in "great numbers" (Benson, 1855a: 131). Nevill (1878: 39) listed a lot of three additional syntypes in the Indian Museum labelled "Chusan ex Mr R. Damon (coll. Cantor)".

Gabbia travancorica (Benson, 1860)

Bithinia travancorica Benson, 1860g: 259
Bythinia travancorica (Benson); Hanley and Theobald, 1870 [in 1870–1876]: 18, Pl. 38, Fig. 2, 3; Nevill, 1885: 35
Bithynia travancorica Benson; Preston, 1915: 72
Amnicola (*Alocinma*) *travanicorica* (Benson); Annandale, 1920a: 42
Gabbia travancorica (Benson); Subba Rao, 1989: 78; Ramakrishna and Dey, 2007: 126, Fig. 79
Type material NHMUK 1954.6.2.706–707, **Fig. 43 E** (one of two syntypes from the J.S. Hawkins collection

labelled "*Bithinea travancorica* Benson, Quilon, W.H. Benson Esq.")
Original measurements: "Long. 6, diam. 5 mill."
Type locality India: "Habitat in stagnis prope Quilon" [lives in ponds near Quilon]
Remarks Benson based his description on several specimens collected by his son, Charles Annesley Benson: "Specimens taken on weed and stones in a pool were in very fine condition ..." According to Subba Rao (1989) this species occurs in South India in Andhra Pradesh (Visakhapatnam) and Kerala (Quilon).

Genus *Parafossarulus* Annandale, 1924

Paludina (*Bithynia*) *striatula* Benson, 1842

Accepted as *Parafossarulus manchouricus* (Bourguignat, 1861); *Bythinia manchourica* Bourguignat, 1861: 535, pl. 24, figs 1–13

Paludina (*Bithynia*) *striatula* Benson, 1842b: 488 (non Deshayes, 1825: 133, Pl. XV, Fig. 15, 16)
Bythinia striatula (Benson); Nevill, 1885: 39
Hydrobioides (*Parafossarulus*) *striatulus* (Benson); Annandale and Prashad, 1924
Parafossarulus striatulus (Benson); Yen, 1942: 198
Type material NHMUK 1842.9.30.18, **Fig. 43 F** (one of three syntypes presented by the Hon. East India Company labelled "*Paludina* (*Bithynia*) *striatula* Cantor, in canals, Island of Chusan"); UMZC I.104905 (four syntypes from the R. McAndrew collection labelled "*Bithynia Striatula* Bens., Bens. col., China"); OUMNH.ZC.MO25564 (syntype, an adult shell with an operculum in the Cantor collection from Chusan, labelled "10. *Paludina striatula*")
Original measurements: none given
Type locality China: Chusan. "In canals, attached to aquatic plants, stones, piles"
Remarks Benson (1842b) did not state the number of specimens collected by Cantor and used for the original description but it was not infrequent at Chusan, although less common than *longicornis* (Benson, 1855a: 131). In addition to the type material listed above, three probable syntypes from Chusan, collected by Cantor, were in the collection of the Indian Museum (Nevill, 1885: 39; Annandale, 1924), presumably now transferred to ZSI. *Paludina striatula* was proposed as the type species of the subgenus *Parafossarulus* Annandale (in Annandale and Prashad, 1924), but *Parafossarulus* has since been elevated to full generic rank. *Paludina striatula* Benson, 1842 is a junior homonym of *Paludina striatula* Deshayes, 1825; the earliest available name for this species, which is common in China, is *Parafossarulus manchouricus* (Bourguignat, 1861).

Family POMATIOPSIDAE

Subfamily POMATIOPSINAE

Tribe TRICULINI

Genus *Tricula* Benson, 1843

Tricula montana Benson, 1843

Tricula montana Benson, 1843: 467; Hanley and Theobald, 1876 [in 1870–1876]: 62, Pl. 155, Fig. 1; Nevill, 1885: 62; Preston, 1915: 68; Prashad, 1921a: 67, text-fig. I
Melania (*Tricula*) *montana* Benson; Gittenberger et al., 2020: 13
Type material NHMUK 1906.1.1.2005/1–2, **Figs 44 A–B** (lectotype and paralectotype (re-registered in error as NHMUK 1964426 and 1964427 respectively) designated by Davis (1968: 62) from the W.T. Blanford collection labelled "*Tricula montana* Bens, Bhimtal, from Benson's types"); NHMUK 1846.1.14.33, **Fig. 44 C** (one of ten paralectotypes presented by W.H. Benson labelled "*Tricula montana* Benson, Bhim Tal, W.H. Benson Esq." (**Fig. 44 F**)); NHMUK 20140788/1, **Fig. 44 D** (one of two paralectotypes labelled "*Tricula montana* Bens, Bhimtal, co-types ex auct., type of genus" (**Fig. 44 G**)); UMZC I.102350.A–C (three paralectotypes, one of which (UMZC I.102350.A, **Fig. 44 E**) is covered with fungus, from the Woodward collection labelled "Bhim Tal, Himilayas, W.H. Benson")
Original measurements: none given
Type locality India: "Hab. in rivo, apud lacum Kunavurensem Bhimtâl dictum" [lives in the river, near the lake known as Bhimtâl, Kumaon]
Remarks The generic status of *Tricula* in Benson's paper is problematic. In the paper title he referred to *Tricula* as "a new type of form allied to *Melania*" (Benson, 1843: 465). He then (pp. 466) listed *Tricula* as a subgenus, without specifying a genus. In the Latin description (pp. 467) he referred to *'T. montana'* and the animal being similar to "Melaniae". He then stated that *Tricula* connected *Paludomus* with the more typical Melaniae. This inconsistent treatment leaves open the question of what the original combination should be. There is no direct attribution to *Melania* and in his description, Benson treats *Tricula* as a distinct genus. We therefore do not follow Gittenberger et al. (2020) in treating the original combination as *Melania (Tricula) montana* but recognise the original combination as *Tricula montana*. Benson collected his original specimens from "a clear and weedy stream running through a marsh at the head of Bheemtâl, and supplying that lake; and subsequently Dr. Bacon and myself found it abundantly on the stems of a water Iris which we drew up by the roots". The lectotype

designated by Davis (1968: 62) was later illustrated, together with a paralectotype, by Davis et al. (1986: figs 3A and 3B) quoting the registration numbers NHMUK 1964426 and 1964427. These numbers were assigned in error: the correct registration number for the lot examined by Davis is NHMUK 1906.1.1.2005, registered as part of the W.T. Blanford collection as "*Tricula montana* Bs., Bhimtal, Nainital" and labelled "Type specimens, Benson". Davis's attribution of these specimens to the "Goodwin-Austen [sic] collection" is also an error. Blanford (1870: 369) mentioned specimens that he had received from "Naini Tal" [Nainital], in the same neighbourhood as Benson's original site but from a rather higher elevation. He also mentioned a record of *T. montana* from North Cachar based on a shell collected there by Godwin-Austen. A specimen from the J.S. Hawkins collection (NHMUK 1954.6.2.93), accompanied by a Benson label that reads "3 *Tricula montana* Bs", is in fact a *Stenothyra*. It appears that the genuine *Tricula* specimen given to Hawkins by Benson was separated from its labels. Other potential syntypes are listed as being in the Indian Museum (Nevill, 1885: 62; Prashad, 1921a) and are presumably now in the ZSI. *Tricula montana* had not been found since Benson's original discoveries in the Nainital region of northern India until 1985, when it was discovered at two localities in the region (Davis et al., 1986). There are reports of *T. montana* from other parts of India (Assam, Uttarakhand) and from two locations in Nepal, and even Sri Lanka (Starmühlner, 1974), but these require confirmation. Gittenberger et al. (2020) recorded the species in Bhutan and also published a phylogeny. *Tricula montana* is the type species of *Tricula* by Benson's original designation.

Family STENOTHYRIDAE

Genus *Stenothyra* Benson, 1856

Stenothyra deltae (Benson, 1837)

Nematura deltae Benson, 1837a: 782
Stenothyra deltae (Benson); Benson, 1856g: 499; Hanley and Theobald, 1870 [in 1870–1876]: 17, Pl. 37, Fig. 2; Nevill, 1885: 43; Preston, 1915: 79; Annandale and Prashad, 1921b: 131, text-fig. 2; Subba Rao, 1989: 87; Ramakrishna and Dey, 2007: 134, Fig. 84
Type material UMZC I.102195, **Fig. 45 A** (one of 10 syntypes, two now missing, from the R. McAndrew collection labelled "*Stenothyra Deltae* Bens., Bens. col., Calcutta"); UMZC I.102200 (five syntypes from the R. McAndrew collection labelled "*Stenothyris Deltae* Bens., Bens. col., Calcutta")
Original measurements: "Long. 0.25 poll." (Benson, 1837a: 782), later given as "Long. 4–5, diam. 2½–3½ mill." (Benson, 1856g: 499)
Type locality India: "Sunderbans east of Jabuna river" and "river Hooghly, immediately opposite the Esplanade"
Remarks Benson based his original description on multiple specimens: "The first specimens which I saw, were shewn to me by Mr. Cracroft, who found them destitute of inhabitant or operculum in Sunderbans east of Jabuna river... About a couple of months subsequently, I discovered it alive between high and low water mark in pools, and on wet mud recently left by the tide in the river Hooghly, immediately opposite the Esplanade." Benson (1856g: 499) provided an extended description of this species when erecting the genus *Stenothyra.* According to Annandale and Prashad (1921b: 132) *S. deltae* occurs far above the area of tidal influence in pure fresh water, as well as in brackish water. They stated that they did not know the location of the types but that some of the specimens preserved in the collections of the Zoological Survey of India were presented by Benson (and are therefore presumably syntypes). However, no ex-Benson material was listed by Nevill (1885: 43). According to Subba Rao (1989: 87) the types are in the NHM, but no specimens were found there that could be linked with certainty to Benson. *Stenothyra deltae* is the type of *Stenothyra* Benson, 1856 by typification of replaced name.

Stenothyra cingulata Benson, 1856 [16]

Stenothyra cingulata Benson, 1856g: 496; Nevill, 1885: 45
Type material UMZC I.104285, **Fig. 45 C** (one of four syntypes, from the R. McAndrew collection labelled "*Nematura Cingulata* Bens., Bens. col., E. Ind.")
Original measurements: "Long. 5, diam. 3 mill."
Other material NHMUK 20190436 (four shells labelled "*Stenothyra cingulata* (Bens), Canton" [a labelling error for 'Cantor'])
Type locality Malaysia: "Hab. ad insulam Penang. Detexit Dr. Theodore Cantor" [lives on the Island of Penang. Discovered by Dr Theodore Cantor]
Remarks The number of specimens provided by Cantor was not stated in Benson's original description, but several were implied. None possessed an operculum. The UMZC specimens are from the Benson collection and are therefore considered to be syntypes, despite the degradation of their locality data to "E. Ind." on McAndrew's replacement label. Such a broad region could be construed as covering Penang, Malaysia, the type locality for the species. Nevill (1885: 45) listed a specimen in the Indian Museum

labelled “Penang (typical); ex c. India House Museum (coll. Cantor)”. It is probable that *S. cingulata* is conspecific with *S. monilifera* Benson, 1856 from Burma (Davis et al., 1986).

Stenothyra foveolata Benson, 1856

Stenothyra foveolata Benson, 1856g: 497; Nevill, 1885: 44; Preston, 1915: 80; Annandale and Prashad, 1921b: 132; Subba Rao, 1989: 88; Ramakrishna and Dey, 2007: 135, Fig. 85
Nematura foveolata (Benson); Hanley and Theobald, 1870: [in 1870–1876] 17, Pl. 37, Fig. 4
Type material UMZC I.102895, **Fig. 45 B** (holotype from the R. McAndrew collection labelled “*Stenothyra Foveolata* Bens., Bens col., Ganges”)
Original measurements: “Long. 5, diam. 3¼ mill.”
Type locality India: “*Hab*. in Gange fluvio, prope Sikrigali. Teste Capt. T. Hutton” [lives in the Ganges River, near Sikrigali, according to Capt. T. Hutton]
Remarks Benson (1856g: 497) appears to have based his description on a single specimen: “This shell has reached me [from Hutton] in a weathered condition, so that the colour and the normal condition of the surface cannot be exactly described.” Nevill (1885: 44) also stated that the illustration provided in Hanley and Theobald (1870) was based on a “unique type”. According to Benson, Sikrigali is located about 300 miles from the sea and about 200 miles above the extreme tidal influence, but this species might be expected to occur lower down the valley, as well as in the Gangetic Delta (cf. Annandale and Prashad, 1921b: 121).

Stenothyra frustillum Benson, 1856

Stenothyra frustillum Benson, 1856g: 498
Type material not located
Original measurements: “Long. 1½, diam. 1 mill.”
Type locality Australia
Remarks Benson’s original description was based on an unspecified number of shells in the collection of Hugh Cuming. This species was regarded as *Incertae sedis* by Smith (1992: 74). In a recent review of Australian and East Timorese Stenothyridae, Golding (2014) noted the possibility that this small species was based on a specimen similar to or conspecific with *Stenothyra gelasinosa* Golding, 2014. The lack of type material, precise locality data or detailed original description make it impossible to resolve the identity of Benson’s species, leading Golding to regard *Stenothyra frustillum* as a *nomen dubium.*

Stenothyra monilifera Benson, 1856

Stenothyra monilifera Benson, 1856g: 497; Blanford, 1867 [in 1862–1870], 36(2): 58, pl. 2 [13], Fig. 15; Blanford, 1868: 58, pl. II [XIII], Fig. 15; Nevill, 1885: 44; Preston, 1915: 80; Annandale and Prashad, 1921b: 127
Nematura monilifera (Benson); Hanley and Theobald, 1870 [in 1870–1876]: 17, Pl. 37, Fig. 4
Type material UMZC I.102865, **Fig. 45 D** (one of 10 syntypes from the R. McAndrew collection labelled “*Stenothyra Monilifera* Bens., Bens. col., Ind.”); UMZC I.102875 (four syntypes from the R. McAndrew collection labelled “*Stenothyra Monilifera* Bens., Bens. col.”, no locality data)
Original measurements: “Long. 4½, diam. 3 mill.”
Other material NHMUK 1888.12.4.1144–1146 (three shells from the W. Theobald collection labelled "*Stenothyra monilifera* Benson, Mergui"); NHMUK 1907.12.30.120 (single shell from the S. Hanley collection labelled "*Stenothyra monilifera* Bens., Fig^{d} in Con. Ind. pl.37 f.4, Mergui")
Type locality Burma: “Hab. ad Mergui Burmanorum. Teste W. Theobald” [lives at Mergui, Burma, according to W. Theobald]
Remarks The number of specimens provided by William Theobald was not noted in Benson’s original description. We presume that the UMZC specimens from Benson’s collection represent the type series, although the locality given on McAndrew’s label has been degraded to “Ind.”, which in this case probably covers several countries including Burma. It occurs extensively in south and Southeast Asia, including coastal areas of Thailand (Gulf of Thailand), Burma, Malaysia, southern Vietnam, Indonesia (Java and Sumatra) and India (Ganga River at Patna and Mokhama) (Brandt, 1974; Nesemann et al., 2007).

Stenothyra strigilata Benson, 1856

Stenothyra strigilata Benson, 1856g: 498; Nevill, 1885: 43
Type material NHMUK 1857.5.9.160, **Fig. 45 E** (syntype from the H. Cuming collection labelled "*strigulata* Bens., Borneo")
Original measurements: “Long. 7, diam. 4 mill.”
Other material UMZC I.104885, **Fig. 45 F** (single shell from the R. McAndrew collection labelled “*Stenothyra Strigillata* Bens., Bens. col., Borneo”)
Type locality Borneo: “Hab. in Insulae Borneo. Mus. Cuming” [lives on the Island of Borneo. Cuming collection]
Remarks Benson based his original description on an unspecified number of shells in the collection of Hugh Cuming.

Family VITRINELLIDAE

Genus *Circulus* Jeffreys, 1865

***Circulus liricinctus* (Benson, 1853)** comb. nov.

Cyclostoma liricinctum Benson, 1853b: 106
Cyclophorus liricinctus (Benson); Pfeiffer, 1854a: 85; 1858: 64
Cyclophorus liricinctum (Benson); Reeve, 1861 [in 1859–1862], 13 (*Cyclophorus*): pl. 20, species 100
Type material UMZC I.104435.A, **Fig. 46 A** (one of two syntypes from the R. McAndrew collection labelled "*Cyclophorus Liricinctus* Bens., Bens. col., Swan R.")
Original measurements: "Diam. major 4, minor 3½, alt. 2 mill"
Type locality Australia: "Hab. ad oras Australiae Occidentalis. Dr. J.F. Bacon" [lives on the coast of Western Australia]
Remarks The number of specimens provided by Dr Bacon was not noted in Benson's original description. Both of the UMZC specimens lack opercula, although this structure was clearly present in at least one of the original specimens. There has been considerable confusion about both the identity and provenance of this species and the next. Given Benson's original generic attribution, and the fact that they are labelled as coming from "Swan River", an early name for the SW region of Western Australia rather than indicative of a fluvial source, they have always been assumed to be land snails. However, no terrestrial operculate resembling them has ever been found in Western Australia, leading several later authors to suspect that the Australian locality given had been mistaken, possibly for an Indian one (Iredale, 1937: 294; Iredale, 1939: 6; Smith, 1992: 35). Their recognition as marine species is consistent with Benson's descriptions and removes the doubt about their Australian provenance. Benson's *liricinctum* has some similarities to *Circulus cinguliferus* (A. Adams, 1850) and *C. tatei* (Angas, 1878), but the spiral sculpture is less pronounced (Peter Middelfart*, pers. comm*.). If Benson's *Cyclostoma liricinctus* is congeneric with *Vitrinella liricincta* Garrett, 1873, then the latter would become a junior homonym.

***Circulus orbiculatus* (Benson, 1853)** comb. nov.

Cyclostoma orbiculatum Benson, 1853b: 106
Cyclophorus orbiculatus (Benson); Pfeiffer, 1854a: 86; 1858: 65
Cyclophorus orbiculatum (Benson); Reeve, 1861 [in 1859–1862], 13 (*Cyclophorus*): pl. 20, species 101; Cox, 1868: 98, pl. 16, Fig. 5
Type material UMZC I.104650.A, **Fig. 46 B** (one of two syntypes from the R. McAndrew collection labelled "*Cyclophorus Orbiculatus* Bens., Bens. col., Swan R.")
Original measurements: "Diam. major 3½, minor 3, axis 2 mill."
Type locality Australia: "Hab. ad oras Australiae Occidentalis. Dr. J.F. Bacon" [lives on the coast of Western Australia]
Remarks The number of specimens provided by Dr Bacon was not noted in Benson's original description, which also did not mention the operculum. This species has always been mistaken for a land snail but it appears to be a marine species (see comments under *Circulus liricinctus*, above). Further work is needed to establish how it relates to the known species of *Circulus* from Australia.

Superorder LATROGASTROPODA

Order NEOGASTROPODA

Superfamily BUCCINOIDEA

Family NASSARIIDAE

Subfamily ANENTOMINAE

Genus *Nassodonta* H. Adams, 1867[17]

***Nassodonta annesleyi* (Benson, 1860)** comb. nov.

Clea annesleyi Benson, 1860g: 258
Nassodonta annesleyi (Benson); Strong et al., 2017
Type material UMZC I.105165.A, **Fig. 46 E** (one of two syntypes from the R. McAndrew collection, accompanied by a label in Benson's handwriting stating "*Clea Annesleyi* Bens, & opercula, Quilon, CAB [Charles Annesley Benson]"); UMZC I.105170 (two syntypes from the R. McAndrew collection labelled "*Clea Annesleyi* Bens?, Bens. col., Quilon"); UMZC I.105175 (two shells from the R. McAndrew collection accompanied by a label, now badly faded, stating "Quilon"); UMZC I.105180 (three syntypes from the R. McAndrew collection labelled by Benson "*Clea*, Quilon")
Original measurements: "Long. 8½, diam. 4½ mill."
Type locality India: "in a tank between the sea and the canal which communicates with Cochin to the north of Quilon [Kollam]"
Remarks The number of specimens provided by Charles Annesley Benson was not noted in Benson's original description. UMZC I.105165 retains Benson's own label bearing the initials "CAB" [Charles Annesley Benson]. This species has never been figured and there has consequently been uncertainty about its family attribution. Benson assigned it to *Clea* H. Adams & A. Adams, 1855, a genus of freshwater snails

originally placed in the Buccinidae but now included in the Nassariidae. This species has subsequently been maintained in *Clea* or *Canidia* H. Adams, 1862 based on Benson's description of the operculum (Brot, 1868). However, the shell of *annesleyi* has a distinctive basal sulcus, leading Strong et al. (2017) to transfer it to the nassariid genus *Nassodonta* (brackish), which they unite with *Clea* and *Anentome* Cossman, 1901 (both freshwater) in a new subfamily, Anentominae (Nassariidae). It appears that the habitat at Quilon containing this species was probably brackish (Benson, 1860g: 260).

Subclass HETEROBRANCHIA

Infraclass EUTHYNEURA

Cohort TECTIPLEURA

Subcohort EUOPISTHOBRANCHIA

Order CEPHALASPIDEA

Superfamily HAMINOEOIDEA

Family HAMINOEIDAE [18]

Subfamily BULLACTINAE

Genus *Bullacta* Bergh, 1901

***Bullacta caurina* (Benson, 1842)**

Bullaea caurina Benson, 1842b: 487
Type material not located
Original measurements: none given
Type locality China: Chusan. "said to inhabit canals"
Remarks The number of specimens provided by Theodore Cantor was not noted in Benson's original description. The types were salvaged by Cantor from a dish of food that had just been eaten for breakfast, but despite some effort and the offer of a reward he was unable to procure any more (Benson, 1855a: 129). An annotated copy of Benson (1842b) in the NHM library includes a note "1 spec. much broken Mus. E.I.C.", together with a pencil sketch of the shell, but this specimen could not be traced. *Bullacta caurina* is an endemic cephalaspidean gastropod from the China Sea. According to Malaquias (2010) this species is a synonym of *Bullacta exarata* (Philippi, 1849), but he cited Benson's later 1855 paper on the molluscs from Chusan rather than the earlier one published in 1842, which includes the original description of *B. caurina*. This species has been assigned to two genera specially created for it, namely *Bullacta* Bergh, 1901 and *Atyscaphander* Annandale, 1924, and it has also been described as a distinct species in yet another genus, namely *Sinohaminea tsangkouensis* Tchang, 1933, although Tchang (1934) subsequently accepted its synonymy. There has also been considerable ambiguity about its family attribution (see Taxonomic Note 18), but recent phylogenetic work indicates that *Bullacta* is sister to the Haminoeidae (Oskars et al., 2015).

Order PTEROPODA

Suborder EUTHECOSOMATA

Superfamily CAVOLINIOIDEA[19]

Family CAVOLINIIDAE

Genus *Clio* Linnaeus, 1767

***Balantium bicarinatum* Benson, 1837**

Accepted as *Clio recurva* (Children, 1823);
Balantium recurvum Children, 1823: 220

Balantium bicarinatum Benson, 1837b: 151
Type material holotype destroyed
Original measurements: "Long. 0.65, Lat. 0.5 poll."
Type locality Indian Ocean: "Habitat in Oceano Indico Australi, non procul ab insulis Amsterdam et Sancti Pauli dictis". [Lat. 36˚, 30′ S., Long. 75˚, 30′ E.] [lives in the southern Indian Ocean, not far from the islands known as Amsterdam and Saint-Paul]
Remarks Benson based his original description on a single specimen, collected on the night of 28th November, 1834, on his voyage from England to India aboard the *Malcolm*. Unfortunately, he also recorded that this and many other specimens collected on that voyage had been preserved in "spirits of insufficient strength" and did not survive. This species has been synonymized with *Clio recurva* (Children, 1823); see van der Spoel (1967).

Genus *Cuvierina* Boas, 1886

***Cuvieria oryza* Benson, 1836**

Cuvieria oryza Benson, 1836c ["1835"]: 698
Type material UMZC I.102040, **Fig. 46 F** (one of six shells from the R. McAndrew collection, associated with a label in Benson's handwriting (**Fig. 46 G**) stating "*Cuvieria oryza*", no locality data)
Original measurements: "Length 4/10 of an inch, of which the spire occupies nearly one-half"
Type locality Indian Ocean: "Taken, from the 15th December, 1834, to the 1st January, 1835, in a tract of the Tropical Indian Ocean contained between the parallels of 8°6' south and 5°0' north, and between the meridians of 86°38' and 91°0' east from London"
Remarks Benson based his original description on two specimens, one of which he collected himself but broke in his tow-net. The other was taken by Lieut. Hatton of H.M. 62nd Regiment, who gave it to Benson. It is not clear which of the six specimens in the UMZC are

Benson's types. Benson's description appeared in the December 1835 part of the *Journal of the Asiatic Society of Bengal*, which must have been published in January 1836 because it contains a complete set of meteorological data for the month of December 1835. *Cuvieria oryza* has long been considered to be a junior synonym or variety of *Cuvierina columnella* (Rang, 1827), but Janssen (2018) concluded that it is in fact a senior synonym of *Cuvierina urceolaris* (Mörch, 1850). Janssen therefore declared *Cuvierina urceolaris* a *nomen protectum*, because the name is in prevailing usage, with Benson's senior name *Cuvieria oryza* declared a *nomen oblitum* in accordance with ICZN Art. 23.9.1.2 (see Janssen, 2018: 373).

Genus *Diacavolinia* van der Spoel, 1987

***Hyalaea fissilabris* Benson, 1861**

Tentatively accepted as *Diacavolinia limbata* (d'Orbigny, 1836); *Hyalaea limbata* d'Orbigny, 1836 [in 1836–1846]: 101–103

Hyalaea fissilabris Benson, 1861b: 26
Type material not located
Original measurements: "Long. 3 ½, diam. 3, alt. corporis 2, alt. labri 3 mill."
Type locality Atlantic Ocean: "taken on the night of the 7th October, 1834, in N. lat. 6˚ and W. long. 22˚ 25′ …"
Remarks This species has been included in the synonymy of *Diacavolinia limbata* (d'Orbigny, 1836), but according to van der Spoel et al. (1993: 145) it could also possibly relate to *Diacavolinia constricta* van der Spoel, Bleeker & Kobayasi, 1993.

Informal Group PULMONATA

Grade LOWER PULMONATA

Superorder HYGROPHILA

Superfamily LYMNAEOIDEA

Family UNCERTAIN

Genus *Camptonyx* Benson, 1858 [20]

***Camptonyx theobaldi* Benson, 1858**

Camptonyx theobaldi Benson, 1858a: 336, pl. 12; Hanley and Theobald, 1874 [in 1870–1876]: 35, Pl. 81, Figs 5, 6; Nevill, 1878: 215; Blanford, 1880: 200; Gude, 1914a: 465, Fig. 145; Ramakrishna et al., 2010: 214
Type material NHMUK 1858.7.23.32, **Fig. 47 A** (syntype presented by W.H. Benson labelled "*Camptonyx theobaldi*, India, W.H. Benson Esq."); UMZC I.102765 (eight syntypes from the R. McAndrew collection labelled "*Camptonyx Theobaldi* Bens., Bens. col., Kattawar")
Original measurements: "Long. 10; dima. Dorsali 4 ½ mill. ; apert. 8 mill. longa, 6 lata."
Other material UMZC I.102770 (six shells from the R. McAndrew collection, five in a pill-box and another separated in a tube, with a label that reads "*Camptonyx Theobaldi*, Peak of Girnar, Kattiwa", no collection data); NHMUK 1888.12.4.837–840 (four shells from the W. Theobald collection labelled "*Camptonyx theobaldi* Bens. (typical), Girnah Peak, Kathawar")
Type locality India: "Ad latera jugi montis "Girnar" dictae, Peninsulae Guzeratensis, invenit W. Theobald junior" [On the side of the mountain ridge known as "Girnar", in the Guzerat Peninsula, found by W. Theobald junior]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description, although he mentioned that the material included a piece of weathered rock on which 26 young specimens were adhering. This species was discovered in abundance adhering to rocks on the central peak of Mount Girnar in Kattiwár, on the peninsula that separates the Gulfs of Cutch and Cambay. NHMUK 1858.7.23.32 closely matches Benson's figure (**Fig. 47 B**), particularly the irregularities of its outline and the pattern of growth-lines. Nevill (1878: 215) listed a lot of 13 shells in the Indian Museum labelled "Girnar Hills, Kattywar; coll. W. Theobald Esq.". Most authorities (e.g. Rao, 1924) include *Camptonyx* with the Succineidae but the anatomical account provided by S.P Woodward in the original description and the accompanying figures, notably the triangular tentacles with their eyes at the base, clearly demonstrate that *Camptonyx* cannot be a stylommatophoran (see also Schileyko, 2007: 2094). The systematic position of *Camptonyx* is uncertain and we provisionally include it in the Lymnaeoidea. *Camptonyx theobaldi* is the type species of *Camptonyx* Benson, 1858 by monotypy.

Family LYMNAEIDAE

Subfamily LYMNAEINAE

Genus *Lymnaea* Lamarck, 1799

Subgenus *Pseudosuccinea* F.C. Baker, 1908

***Lymnaea chlamys* Benson, 1836**

Accepted as *Lymnaea* (*Pseudosuccinea*) *acuminata chlamys* Benson, 1836

Lymnaea chlamys Benson, 1836b: 744; Reeve and Sowerby, 1872 [in 1870–1872], 18 (*Limnaea*): pl. 10, species 65; Hanley and Theobald, 1873 [in 1870–1876]: 30, Pl. 69, Figs 5, 6

Limnaea (*Limnaea*) *acuminata* var *chlamys* Benson; Preston, 1915: 108
Limnaea acuminata form *chlamys* Benson; Annandale and Rao, 1925: 181
Lymnaea (*Pseudosuccinea*) *acuminata* form *chlamys* Benson; Subba Rao, 1989: 127; Ramakrishna and Dey, 2007: 200, Fig. 143
Type material UMZC I.102280, **Fig. 47 C** (one of two syntypes from the R. McAndrew collection labelled "*Limnaea Chlamys* Bens., Bens. col., Ind."); UMZC I.102285 (two syntypes from the R. McAndrew collection labelled "*Limnaea Rufescens* Gray =*Chlamys* pars, Bens. col., Ind."); UMZC I.102290 (four syntypes from the R. McAndrew collection labelled "*Limnaea Rufescens* Gray *Chlamys* pars, Bens. col., Ind."); UMZC I.104945 (three syntypes from the R. McAndrew collection labelled *L. Chlamys* Bens. Bens. col."); UMZC I.104946 (three syntypes from the R. McAndrew labelled "*Chlamys* Bens., Bens. col.", no locality data); NHMUK 1954.6.2.1104–1105 (two syntypes from the J.S. Hawkins collection labelled "*Lymnaea chlamys* Benson, ?Paratypes, Moradabad, W.H. Benson 1862")
Other material NHMUK 20200348 (single shell from the S. Hanley collection labelled "*chlamys* from type, Moradabad")
Original measurements: none given
Type locality India/Bangladesh: "The *Lymnaea* in the Silhet collection [of the Asiatic Society] is the chestnut-coloured variety. The paler kind is met with in great perfection in Lehtára jhil, near Banáras, in company with *Planorbis compressus* ...."
Remarks Benson's type series included 'chestnut-coloured' material in the collection of the Asiatic Society and 'paler' specimens from other collections, presumably including his own. Given this ambiguity we therefore assume that all of the 'pale' specimens from the Benson collection form part of the type series. Hubendick (1951: 184) regarded *L. chlamys* as belonging to the *rufescens* race of *Radix auricularia* (Linnaeus, 1758) but both *L. chlamys* and *L. rufescens* are now thought to be forms of *Lymnaea* (*Pseudosuccinea*) *acuminata* Lamarck, 1822 (Subba Rao, 1989: 127).

Genus *Austropeplea* Cotton, 1942

Lymnaea minor Benson, 1842

Tentatively accepted as *Austropeplea viridis* (Quoy & Gaimard, 1832); *Lymnaea viridis* Quoy and Gaimard, 1832: 204, pl. 58, figs 16–18

Lymnaea minor Benson, 1842b: 487
Limnaeus minor Benson; Nevill, 1878: 233
Type material not located
Original measurements: none given
Type locality China: Chusan. "ponds"
Remarks The number of specimens provided by Cantor was not noted in Benson's original description. Hubendick (1951: 195) thought that this species was probably synonymous with *Austropeplea viridis* (Quoy and Gaimard, 1832), a species with a wide distribution throughout Southeast Asia, from China and Japan to Burma and the Philippines (Ponder and Waterhouse, 1997). Recent molecular studies have suggested that *A. viridis* may actually represent a number of distinct taxa (Puslednik et al., 2009).

Genus *Radix* Montfort, 1810

Lymnaea plicatula Benson, 1842

Accepted as *Radix auricularia* (Linnaeus, 1758); *Helix auricularia* Linnaeus, 1758, *Systema Naturae* ed. 10: 774, no 617

Lymnaea plicatula Benson, 1842b: 487
Limnaeus plicatulus Benson; Nevill, 1878: 233
Type material NHMUK 1842.9.30.50–51, **Fig. 47 D** (one of two syntypes presented by the Hon. East India Company labelled "*Lymnaea plicatula* Cantor, ponds in Chusan"); OUMNH.ZC.MO25559 (two syntypes from the T. Cantor collection labelled "5. *Lymnaea plicatula*")
Original measurements: none given
Type locality China: Chusan. "ponds"
Remarks The number of specimens provided by Cantor was not noted in Benson's original description, although this species was said to be common in "fresh water, floating on the surface, or attached to *Chara*" (Benson, 1855a). Nevill (1878: 233) listed a lot of three shells in the Indian Museum labelled "Chusan; coll. Dr. Cantor, ex Damon", which might also form part of the type series. Hubendick (1951: 200) placed this species in the synonymy of *Radix auricularia* (Linnaeus, 1758).

Family BULINIDAE

Tribe BULININI

Genus *Indoplanorbis* Annandale & Prashad, 1921

Planorbis indicus Benson, 1836

Accepted as *Indoplanorbis exustus* (Deshayes, 1834); *Planorbis exustus* Deshayes in Bélanger, 1834: 417, pl. 1, figs 11–13

Planorbis indicus Benson, 1836b: 743; Hanley and Theobald, 1870 [in 1870–1876]: 18; Reeve and Sowerby, 1877 [in 1875–1878], 20 (*Planorbis*): Pl. 4, Fig. 31
Planorbis exustus Deshayes; Preston, 1915: 115

Type material NHMUK 1841.7.23.5, **Fig. 47 E** (syntype presented by Dr Thomas Horsfield labelled "*Planorbis indicus* Benson, Himalayah". An accompanying register entry reads "*Planorbis indicus* n. 25")
Original measurements: "In some waters the species attains a great size, being 0.9 of an inch in diameter"
Other material UMZC has two lots from the Benson collection, one of 10 shells from "Bombay" and a second lot labelled by McAndrew "*Planorbis Exustus* var. Desh = *Indicus* Bens.", no locality data); NHMUK 1856.9.15.24 (11 shells labelled "*Planorbis indicus* Bens., India, Captain T. Hutton")
Type locality India and Bangladesh: the Gangetic provinces (see below)
Remarks The number of specimens examined was not noted in Benson's original description, although he noted that this species was "scattered over the whole of the Gangetic provinces, and scarcely a pool of water can be found destitute of it". He also stated that specimens of *Planorbis corneus* from India mentioned and figured in earlier publications by himself (Benson, 1829d: 264; **Fig. 47 F**) and Hutton (1834: 90) were in fact this species. NHMUK 1841.7.23.5 was transferred from the Asiatic Society to the EIC's India Museum in London and corresponds with the specimen listed by Pearson (1840: 729). *Planorbis indicus* has been synonymized with *Indoplanorbis exustus* (Deshayes, 1834), an important intermediate host of several tremode parasites. *Indoplanorbis exustus* is a common species across Southeast Asia and the Indian subcontinent but it also occurs in the Middle East (Oman and Socotra) and in Nigeria and the Ivory Coast (Kristensen and Ogunnowo, 1987; Brown, 2002). In view of the veterinary and medical importance of this invasive snail, phylogenetic studies have been undertaken, which suggest that the supposedly monospecific genus *Indoplanorbis* is actually a species complex (Liu et al., 2010). The type locality of *Indoplanorbis exustus* is marshes on the coast of Malabar in southwestern India (Deshayes, 1834) but it remains to be seen whether the *Indoplanorbis* from there are really conspecific with those from the Gangetic provinces, the type locality of *indicus*.

Family PLANORBIDAE

Subfamily PLANORBINAE

Tribe PLANORBINI

Genus *Gyraulus* Charpentier, 1837

Gyraulus hyptiocyclos (Benson, 1863)

Helix hyptiocyclos Benson, 1863a: 89
Planorbis hyptiocyclos (Benson); Hanley and Theobald, 1874 [in 1870–1876]: 40, Pl. 99, Figs 5–7; Reeve and Sowerby, 1877 [in 1875–1878], 20 (*Planorbis*): Pl. 14, Fig. 120
Planorbis (*Nautilina*) *hyptiocyclos* Benson; Nevill, 1878: 245
Goniodiscus hyptiocyclos (Benson); Tryon, 1887: 46
Trochomorpha hyptiocyclos (Benson); Gude, 1914a: 5
Planorbis (? *Gyraulus*) *hyptiocyclos* (Benson); Preston, 1915: 123
Planorbis (*Diplodiscus*) *hyptiocyclos* (Benson); Germain, 1921–1924: 86
Gyraulus hyptiocyclos (Benson); Rao, 1989: 158
Type material a neotype (NHMUK 1864.5.14.4, **Fig. 48 A**) is hereby designated using a single shell presented by F. Layard labelled "*Helix hyptiocyclos* Benson, Fort MacDonald, Upper Ouvah, Ceylon". We have designated a neotype with the express purpose of clarifying the taxonomic status of *H. hyptiocyclos* (see below).
Original measurements: "Diam. major 6, minor 5, alt. 1½ mill."
Other material UMZC I.103365 (two shells from the R. McAndrew collection labelled "*Helix Hyptiocyclos* Benson, Ft McDonald, Ceylon", no collection data); USNM 515595 (nine shells from the J. Calvert collection from what appears to be the type locality, the original label being marked "type" (J. Rosewater, in litt. 5th Jan. 1982))
Type locality Sri Lanka: "sub stercore bovillo ad latera collium prope Fort McDonald teste F. Layard" [Under the manure of cattle on the flanks of the hills near Fort McDonald, according to F. Layard]
Remarks Benson (1863a: 89) mentioned several specimens provided by Frederick Layard in his original description: "The specimens were taken in a living state, and it is a matter for regret that the tentacula and eyes were not examined at the time of capture...". The UMZC specimens labelled as *Helix hyptiocyclos* Benson are in fact *Gyraulus convexiusculus* (Hutton, 1849); moreover, they are not labelled as coming from the Benson collection. Nevill (1878: 245) listed a lot of three shells in the Indian Museum labelled "Fort McDonald, Ceylon (typical); ex c. F.L. Layard, Esq.". One of these is likely to be the specimen figured by Germain (1921–1924: pl. II, figs 1–3). In the absence of genuine type material from the Benson collection, we therefore designate NHMUK 1864.5.14.4 as the neotype.

Gyraulus labiatus (Benson, 1850)

Planorbis labiatus Benson, 1850c: 350
Planorbis (*Gyraulus*) *labiatus* (Benson); Preston, 1915: 119, Fig. 5
Gyraulus labiatus (Benson); Subba Rao, 1989: 155; Ramakrishna and Dey, 2007: 237, Fig. 175
Type material not located
Original measurements: "Diam. maj. 5, minor 4, axis vix 2 mill."
Type locality India: "Hab. in stagno prope urbem Moradabad. Inter specimina *Pl. compressi* (Hutton) detexi" [lives in ponds near the town of Moradabad. Discovered amongst specimens of *Pl*[*anorbis*] *compressus* (Hutton)]
Remarks The number of specimens examined was not noted in Benson's original description. The type series was apparently lost at an early stage, since Hanley and Theobald (1870–1876: xviii, footnote 4) noted that "The type… could not be descried in Benson's collection", although Preston (1915: 119) was able to produce a figure apparently based on the "Types". According to Ramakrishna and Dey (2007: 237) the type material is located at the NHM but we have been unable to trace this. This species is listed in McAndrew's *Catalogue* but no Benson specimens could be found in the UMZC. It is widely distributed in Bangladesh, India, Nepal and Burma. Subba Rao (1989) noted the similarity of *G. labiatus* with "*Planorbis compressus* Hutton" suggesting that they may possibly be conspecific.

Gyraulus rotula (Benson, 1850)

Planorbis rotula Benson, 1850c: 351; Hanley and Theobald, 1874 [in 1870–1876]: 40, Pl. 99, Figs 2, 3
Planorbis (*Nautilina*) *rotula* Benson; Nevill, 1878: 245
Planorbis (*Gyraulus*) *rotula* Benson; Preston, 1915: 122
Gyraulus rotula (Benson); Subba Rao, 1989: 157; Ramakrishna and Dey, 2007: 240, Fig. 178
Type material UMZC I.103690.A, **Fig. 48 B** (one of six syntypes from the R. McAndrew collection labelled "*Planorbis Rotula* Bens., Bens. col., India")
Original measurements: "Diam. maj. 2 2/3, minor 2, paulo plus [a little more], axis 1 mill."
Type locality India: "Hab. in Rohillano, prope urbem Moradabad, raro occurrens" [lives in Rohilla, near the town of Moradabad, rarely]
Remarks Benson's type series consisted of more than one specimen: "The shells must have lain under ground during at least nine months in the year, and I failed to find them in the same spot at the corresponding season in subsequent years" (Benson, 1850c: 351). According to Ramakrishna and Dey (2007: 240) the type material is located in the NHM but we have been unable to trace this. Brandt (1974) noted that while this species has a wide distribution being known from India (Uttar Pradesh, Maharashtra), Sri Lanka (Point de Galle) and Thailand (Aranyapratet), it always appears to be extremely rare. It has recently been reported from Nepal (Glöer and Bössneck, 2013) and Bhutan (Gittenberger et al., 2017a).

Tribe CAMPTOCERATINI

Genus *Camptoceras* Benson, 1843

Camptoceras terebra Benson, 1843

Camptoceras terebra Benson, 1843: 465; Benson, 1855c: 10, text–fig.; Hanley and Theobald, 1876 [in 1870–1876]: 64, Pl. 158, Figs 1–2; Gude, 1914a: 461, Fig. 142
Type material UMZC I.102360.A, **Fig. 48 C** (one of 14 syntypes from the R. McAndrew collection labelled "*Camptoceros Terebra* Bens., Bens. col., Ind.")
Original measurements: none given
Other material UMZC I.102365, **Fig. 48 D** (single shell from the R. McAndrew collection labelled by Hanley "*Camptoceras terebra*, Bn, figured in *Conch. Ind*."); UMZC I.102355 (single shell from the R. McAndrew collection labelled "*Camptoceros terebra*, Moradabad", no collection data); UMZC I.102370 (eight shells from the R. McAndrew collection labelled by Hanley "*Camptoceras terebra* Benson, British India"); NHMUK 20190437 (single shell from the W.T./H.F. Blanford collection labelled "*Camptoceras terebra* Bens, Moradabad", with an additional label stating "Prob. from Benson, W.T.B. collection prob. made not long after Benson descr.")
Type locality India: "in the wide alluvial bed of the Ramgunga, north of the station and race-course of Moradabad, in Rohilkhund. It was discovered by J.F. Bacon Esq., Bengal Medical Service" (Benson, 1843: 466)
Remarks The number of specimens provided by J.F. Bacon was not noted in Benson's original description, which included a drawing (**Fig. 48 E**). Two specimens (NHMUK 1846.1.14.31–32), presumably from the type series, were donated to the BM by Benson himself in 1846, but a later annotation to the museum register records them as having been "smashed by a boy attendant, 1882". Several lots in the UMZC are not labelled as being from the Benson collection, although this is likely. According to Ramakrishna and Dey (2007: 245) further material was present in the ZSI but the "paratype" is lost. Benson (1855c) noted that the animal had a limited distribution and occurred in deep water, adhering to the decaying stems of a reedy sedge, into which it frequently burrowed (see also Godwin-

Austen, 1899: 245). Subba Rao (1989) noted that this is a rare species with a rather restricted distribution in India. He figured a specimen collected from the exposed bed of the River Hooghly at Mogra (50 km north of Calcutta), the first published record of this species since its original discovery by Benson. *Camptoceras terebra* is the type species of *Camptoceras* Benson, 1843 by monotypy.

Tribe SEGMENTININI [21]

Genus *Hippeutis* Charpentier, 1837

Subgenus *Helicorbis* Benson, 1855 [22]

Hippeutis (*Helicorbis*) *umbilicalis umbilicalis* (Benson, 1836)

Planorbis umbilicalis Benson, 1836b: 741; Hanley and Theobald, 1870 [in 1870–1876]: 18, Pl. 40, Figs 7, 8, 9
Planorbis (*Segmentina*) *umbilicalis* Benson; Nevill, 1878: 246; Preston, 1915: 125
Segmentina umbilicalis (Benson); Germain, 1921–1924: 176
Hippeutis (?) *umbilicalis* (Benson); Annandale et al., 1921: 284
Helicorbis umbilicalis (Benson); Baker, 1945: 106–108
Hippeutis (*Helicorbis*) *umbilicalis* (Benson); Brandt, 1974: 244
Planorbis caenosus Benson, 1850c: 349; Brandt, 1974: 244
Hippeutis (*Helicorbis*) *umbilicalis umbilicalis* (Benson); Subba Rao, 1989: 148; Ramakrishna and Dey, 2007: 251, figs 188–189
Type material UMZC I.102235.A, **Fig. 49 A** (one of two syntypes from the R. McAndrew collection labelled "*Planorbis Umbilicalis* Bens., Bens. col., Sylhat")
Original measurements: "Diam. 0.3 poll."
Other material NHMUK 1880.5.7.10 (single shell labelled "*Planorbis umbilicalis* Benson, Khasyah Hills. Dr Cantor, 42.")
Type locality Bangladesh: "Probably an inhabitant of the streams of Silhet"
Remarks The number of specimens examined was not noted in Benson's original description, which was based on material in the collection of the Asiatic Society. The Benson collection specimens have opaque shells making it difficult to determine whether they possess internal septa. Both of these adult shells were therefore examined using a CT scanner, which revealed that neither have internal septa. Nevill (1878: 246) listed a lot of two shells in the Indian Museum labelled "Sylhet; ex c. As. Soc., Bengal"; these are also likely to form part of the type series. Germain (1921–1924, pl. II, figs 19–21) figured a specimen in the Indian Museum of '*Segmentina umbilicalis*' from Sylhet, which might be one of these shells. Benson (1855a) did not cite a type species for *Helicorbis* but Baker (1945: 106) nominated *umbilicalis*, one of the original species listed. Baker also provided anatomical details of *umbilicalis*. According to Brandt (1974), *Planorbis caenosus* Benson 1850 is a junior synonym of *Hippeutis* (*Helicorbis*) *umbilicalis* (Benson 1836).

Hippeutis (*Helicorbis*) *umbilicalis cantori* (Benson, 1850)

Planorbis cantori Benson, 1850c: 349
Planorbis (*Segmentina*) *cantori* Benson; Nevill, 1878: 246; Preston, 1915: 126
Gyraulus cantori (Benson); Annandale et al., 1921: 583
Segmentina cantori (Benson); Germain, 1921–1924: 173
Hippeutis (*Helicorbis*) *cantori* (Benson); Chung et al., 1994: 27
Type material not located
Original measurements: "Diam. maj. 7, minor 6¼, alt. 2 mill. Diam. spirae 3½; lat. anfract. ult., antice, 3 mill."
Type locality India: "Hab. in stagnis Bengalensibus prope castra Barrackpore. Teste Theo. Cantor". [lives in ponds near the Bengal camp of Barrackpore, according to Theodore Cantor]
Remarks The number of specimens provided by Cantor was not noted in Benson's original description. *Planorbis cantori* is listed in McAndrew's *Catalogue* but no Benson specimens could be traced in the UMZC. This species has been assigned to several planorbid genera. It was regarded as a subspecies of *Hippeutis umbilicalis* by Pace (1973) but has been treated as distinct by others. The mitochondrial DNA of material identified as this subspecies was described by Chung et al. (1994) from populations in Korea.

Planorbis caenosus Benson, 1850 [23]

Accepted as
Hippeutis (*Helicorbis*) *umbilicalis umbilicalis* (Benson, 1836); *Planorbis umbilicalis* Benson, 1836b: 741

Planorbis caenosus Benson, 1850c: 349; Hanley and Theobald, 1870 [in 1870–1876]: 18, Pl. 39, Figs 7, 8; Reeve and Sowerby, 1878 [in 1875–1878], 20 (*Planorbis*): Pl. 10, Fig. 78
Planorbis (*Segmentina*) *caenosus* Benson; Nevill, 1878: 246; Preston, 1915: 127
Hippeutis caenosus (Benson); Prashad, 1922: 15
Type material UMZC I.103663.A, **Fig. 49 B** (one of five syntypes from the McAndrew collection labelled "*Planorbis Caenosus* Bens., Bens. col., Ind.")

Original measurements: "Diam. maj. Vix 6 mill., minor 5, axis 1½"
Other material UMZC I.103660 (four shells from the McAndrew collection labelled "*Planorbis Caenosus* Bens., Bens. col., Ceylon")
Type locality India: "Hab. in stagno prope urbem Moradabad, agris Rohillanis" [lives in pools near the town of Moradabad, Rohilla country]
Remarks Benson based his original description on more than one specimen. The specimens in the Benson collection from "Ceylon" (UMZC I.103660) cannot be syntypes since they do not come from the type locality. According to Brandt (1974) *P. caenosus* is a synonym of *Segmentina trochoidea* (Benson) and *Hippeutis* (*Helicorbis*) *umbilicalis*. However, *trochoidea* has internal septa and the proposed synonymy with *caenosus* must therefore be incorrect.

Hippeutis (*Helicorbis*) *papyraceus* (Benson, 1842)

Planorbis papyraceus Benson, 1842b: 487
Planorbis (?) *papyraceus* Benson; Nevill, 1878: 245
Segmentina papyracea (Benson); Germain, 1921–1924: 178
Helicorbis papyraceus (Benson); Baker, 1945: 107
Type material NHMUK 1842.9.30.1, **Fig. 49 C** (syntype presented by the Hon. East India Company labelled "*Planorbis papyraceus* Cantor, ponds, Island of Chusan")
Original measurements: none given
Type locality China: Chusan. "Canals, ponds, attached to *Chara*"
Remarks The number of specimens provided by Cantor was not noted in Benson's original description. Nevill (1878: 245) listed a lot of two shells in the Indian Museum labelled "Chusan; coll. Cantor, ex Damon", which might also be syntypes. Baker (1945: 107) considered this a valid species, which he included with *umbilicalis* and *caenosus* in the genus *Helicorbis*. Whether *Helicorbis* is generically distinct from *Hippeutis* requires clarification (cf. Albrecht et al., 2007).

Genus *Segmentina* J. Fleming, 1818 [21]

Segmentina trochoidea (Benson, 1836) [24]

Planorbis trochoideus Benson, 1836b: 742; Hanley and Theobald, 1870 [in 1870–1876]: 18, Pl. 39, Figs 4–6; Reeve and Sowerby, 1877 [in 1875–1878], 20 (*Planorbis*): Pl. 9, Fig. 70
Planorbis trochoides Benson; Benson, 1850c: 352
Planorbis (*Segmentina*) *trochoideus* Benson; Nevill, 1878: 246 (as *trochoides*); Preston, 1915: 125
Trochorbis trochoideus (Benson); Baker, 1945: 108
Segmentina (*Trochorbis*) *trochoideus* (Benson); Brandt, 1974: 246
Segmentina (*Polypylis*) *trochoidea* (Benson); Subba Rao, 1989: 150; Ramakrishna and Dey, 2007: 248, Fig. 185
Type material UMZC I.102220.A, **Fig. 49 F** (one of two syntypes, one now lost, from the R. McAndrew collection labelled "*Planorbis* (*Segmentina*) *Trochoideus* Bens., Bens. col., Barrackpore")
Original measurements: none given
Other material UMZC I.102215.A, **Fig. 49 G** (one of two shells from the R. McAndrew collection labelled "*Planorbis Trochoides* [later corrected in pencil to *Trochoideus*) Bens., type, Bens. col., Nilgherries")
Type locality India: "The only specimens met with were taken by me, in August 1835, in the gardens of Barrackpur Park, near a tank, on the margin of which are some artificial ruins"
Remarks Despite the claim of "type" status for UMZC I.102215, these shells cannot have formed part of the type series because they do not come from the type locality. The specimen from UMZC I.102220 therefore appears to be the only surviving syntype. According to Ramakrishna and Dey (2007: 249), type material exists in the NHM, but we have been unable to trace this. Internal septa are clearly visible on the UMZC specimens. *P. trochoideus* is the type species of *Trochorbis* Benson, 1855. Baker (1945), however, noted the similarity of *Trochorbis* to *Polypylis*, whereas Kennard and Woodward (1926: 90) considered *Trochorbis* a synonym of *Segmentina* Fleming, 1817, listing *Trochorbis trochoides* Benson [sic] as a junior synonym of *Segmentina nitida* (O.F. Müller, 1774). In India *S. trochoidea* has been recorded from Belgaon (Karnataka), Chennai (Tamil Nadu) and Kolkata (West Bengal).

Segmentina sindicus (Benson, 1850)

Planorbis sindicus Benson, 1850c: 350; Hanley and Theobald, 1870 [in 1870–1876]: 18, Pl. 40, Figs 4–6
Planorbis (*Segmentina*) *sindicus* (Benson); Preston, 1915: 126
Segmentina indica (Benson); Germain, 1921–1924: 175
Type material UMZC I.103595, **Fig. 49 D** (holotype from the R. McAndrew collection labelled "*Planorbis Sindicus* Bens., type, Bens. col." (**Fig. 49 E**), no locality data)
Original measurements: "Diam. 2½ mill., axis 2/3 mill."
Type locality Pakistan: "Hab. in fluvio Indo, regione Sindica superiori" [lives in the Indus river, in the Upper Sind region]
Remarks Benson (1850c: 350) based his description on a single specimen (2.5 mm diameter) found adhering to

the inside of a shell of *Bellamya bengalensis* "from the banks of the Indus above Sukkur", sent to him by Major FitzGerald. He noted that, like the shell of *trochoideus*, it had a small umbilicus but had a less trochoid and more lenticular form. This specimen is now badly damaged but the shell is translucent and no internal septa are apparent. Benson (1836b) commented in relation to *trochoideus* that "The infrequency and irregularity of the internal laminae in this species [*trochoideus*], causing them to look more like accidental thickenings of the shell, made me overlook this structure in my original description." The absence of septa in the specimen of *sindicus* may therefore have no significance. It has been regarded as a synonym of *S. trochoideus* but its status as a distinct species remains uncertain. It is not mentioned by Subba Rao (1989), Ramakrishna and Dey (2007) or Tripathy and Mukhopadhayay (2015).

Genus *Polypylis* Pilsbry, 1906 [21]

Polypylis calathus (Benson, 1850)

Planorbis calathus Benson, 1850c: 348; Hanley and Theobald, 1870 [in 1870–1876]: 18, Pl. 39, Figs 1–3; Reeve and Sowerby, 1877 [in 1875–1878], 20 (*Planorbis*): Pl. 4, Fig. 30
Planorbis (*Segmentina*) *calathus* Benson; Nevill, 1878: 246; Preston, 1915: 127
Segmentina calathus (Benson); Prashad, 1922: 16
Segmentina (*Polypylis*) *calathus* (Benson); Haas, 1939: 97–98
Polypylis calathus (Benson); Baker, 1945: 104–106
Segmentina (*Polypylis*) *calatha* (Benson); Subba Rao, 1989: 150; Ramakrishna and Dey, 2007: 246, Fig. 182
Type material UMZC I.103570.A, **Fig. 48 F** (one of over 30 syntypes from the R. McAndrew collection labelled "*Segmentina Calathus* Bens., Bens. col., India"; "*Polypylis*" has subsequently been substituted for "*Segmentina*"); NHMUK 1954.6.2.1187–1188 (two syntypes from the J.S. Hawkins collection labelled "*Planorbis* (*Segmentina*) *calathus* Benson, Moradabad, W.H. Benson, 1861")
Original measurements: "Diam. major 4 2/3, minor 4, axis 2 mill."
Other material NHMUK 20190438 (three shells from the Cuming collection labelled "*calathus* Benson, India, Bacon"); UMZC I.103575 (five shells from the R. McAndrew collection labelled "*Polypylis calathus*, Ganges", no collection data)
Type locality India: "Hab. in lacubus Bhimtal et Neini Tal, regionis Kemaonensis Himalayanae; necnon in stagnis nonnullis agri Rohillani, prope urbem Moradabad, Indiae septentrionalis" [lives in the Bhimtal and Neini Tal lakes, in the Kumaon region of the Himalaya, and also in the many pools of Rohilla country, near the town of Moradabad, northern India]
Remarks Benson (1850c: 348) based his description on more than one specimen: "It is a very local species, but abundant in the places indicated". Benson first encountered this species on a collecting trip to the Ramgunga river near Moradabad with Dr J.F. Bacon in 1842 (Benson, 1843: 466) and alluded to it in print without providing a detailed description: "I discovered a few specimens of a shallow *Ancylus*, and of *Planorbis Calathus*, of which Dr Bacon had observed dead specimens under stones" (Benson, 1843: 467). The appearance of Benson's name in print before the publication of his formal description explains the presence in the NHM of a lot of 12 shells, registered in 1848 as "*Planorbis calathus*, Moradabad" (NHMUK 1848.9.15.202–216), but with a later label "*Hippeutis* (?) *caenosus* (Bs.) not *calathus* which is a *Segmentina*. 1937 APR". The register states "Purchased at Stevens's" [an auction house in King Street, Covent Garden, noted for its shell sales]. However, these specimens lack internal septa and therefore cannot form part of the type series. The shells from the J.S. Hawkins collection were presented to him by Benson in March 1861 [ZOO MSS HAW]. Nevill (1878: 246) listed a lot of five specimens in the Indian Museum labelled "Moradabad (typical); coll. Benson, ex c. As. Soc., Bengal"; these are probably syntypes. UMZC I.103575 cannot form part of the type series as the shells are not from the type locality. Internal septa are clearly visible in the Benson specimens, which he mentioned in a footnote in 1843, describing *P. calathus* as "Nearly related to a species found in Bengal by Dr Cantor, and to another species from Chusan. It is however easily distinguished by the circumstance of it being furnished interiorly with a series of toothed ridges at irregular intervals". Baker (1945: 104–106) provided details of the anatomy of this species based on a specimen from Burma. According to Subba Rao (1989) it is widely distributed in northern India, where it has been identified from Uttar Pradesh, Bihar, West Bengal, Assam, Imphal and Mingyang Pukri in the Manipur Valley. It is also known from Thailand and Sri Lanka.

Polypylis hemisphaerula (Benson, 1842)

Planorbis hemisphaerula Benson, 1842b: 487; 1850c: 348
Planorbis (*Segmentina*) *hemisphaerula* Benson; Nevill, 1878: 246
Polypylis hemisphaerula (Benson); Baker, 1945: 104–106
Segmentina (*Polypylis*) *hemisphaerula* (Benson): Haas, 1939: 97; Brandt, 1974: 246

Type material UMZC I.104365, **Fig. 48 G** (syntype from the McAndrew collection labelled "*Planorbis Hemisphaerula* Cantor, Bens. col., Chusan")
Original measurements: "Diam. major 6 mill., minor 5, axis vix 3 mill."
Type locality China: Chusan. "canals and ponds on *Chara* and *Lemna*"
Remarks Benson (1842b) did not state how many specimens he received from Cantor, whom he mistakenly thought had described the species. However, in a later account of the Chusan fauna, this species was said to be "not numerous" (Benson, 1855a: 127). Benson (1850c: 348) noted that the shell of this species had internal septa, a feature omitted from his original description. Nevill (1878: 246 listed a lot of two shells in the Indian Museum labelled "Chusan (typical); coll. Dr. Cantor, ex Damon", which might form part of the type series. Germain (1921–1924, pl. II, figs 13–15) illustrated a specimen of "*Segmentina hemisphaerula*" in the Indian Museum from Chusan collected by Cantor, which might be one of these shells. Baker (1945: 104) provided details of the anatomy of *P. hemisphaerula* based on specimens that he had received from Peiping, China. He noted that unlike other species attributed to *Polyplylis*, *P. hemisphaerula* possessed one swollen flagellum on a long duct. Recent phylogenetic work has been undertaken on this species supporting the generic separation of *Polypylis* from *Segmentina* and *Hippeutis* (Albrecht et al., 2007). *Polypylis hemisphaerula* is a widely distributed species in southern and eastern China, Japan, the Korean Peninsula, Thailand and Indo-China (Brandt, 1974). Mitochondrial DNA of material identified as this species was described by Chung et al. (1994) from populations in Korea. Pilsbry (1906) designated *Planorbis largillierti* Dunker, 1867 (a junior synonym of *P. hemisphaerula*) as the type species of *Polypylis* Pilsbry, 1906.

Subfamily ANCYLINAE

Tribe ANCYLINI

Genus *Ancylus* O.F. Müller, 1773

Ancylus ceylanicus Benson, 1864

Ancylus ceylanicus Benson, 1864a: 139; Hanley and Theobald, 1874 [in 1870–1876]: 35, Pl. 81, Figs 2, 3; Preston, 1915: 104
Ancylus (*Ferrissia*) *ceylanicus* (Benson); Annandale et al., 1921: 591
Ferrissia ceylanica (Benson); Subba Rao, 1989: 138; Ramakrishna and Dey, 2007: 256

Type material UMZC I.103950, **Fig. 50 A** (syntype from the R. McAndrew collection labelled "*Ancylus Ceylanicus* Bens., Bens. col., Ceylon")
Original measurements: "Long. 6, lat. 4, alt. 2½ mill."
Type locality Sri Lanka: "Habitat in regione Matelle Ceylanica" [lives in the Matelle region of Ceylon]
Remarks Benson (1864a: 139) mentioned two shells "procured by Mr. F. Layard from the Lagelle division of the Matelle district." Annandale and Prashad (1921) remarked on the similarity of this species to *Ferrissia verruca* and Subba Rao (1989) even considered that it was merely a variety of it, but provisionally retained the name and placed it within *Ferrissia*. Hubendick (1970) provided a good description and figure of a specimen of *A. ceylanicus* from Ceylon in the Hanley collection (NHM) that clearly showed strong apical sculpture indicating that it belongs within *Ancylus*. The Benson specimen illustrated here shows the same characteristic sculpture.

Genus *Ferrissia* Walker, 1903

Ferrissia verruca (Benson, 1855)

Ancylus verruca Benson, 1855c: 12; Hanley and Theobald, 1874 [in 1870–1876]: 35, Pl. 81, Figs 2, 3; Nevill, 1878: 248; Preston, 1915: 105
Ancylus (*Ferrissia*) *verruca* (Benson); Annandale et al., 1921: 589
Ferrissia (*Pettancylus*) *verruca* (Benson); Brandt, 1974: 249
Ferrissia verruca (Benson); Subba Rao, 1989: 139; Ramakrishna and Dey, 2007: 258, Fig. 192
Type material UMZC I.103565, **Fig. 50 B** (one of over forty syntypes from the R. McAndrew collection labelled "*Ancylus Verruca* Bens?, Bens. col.", no locality data)
Original measurements: "Long. 3 ½, diam. vix 2 mill., alt. 1 mill."
Type locality India: "Hab. ad lacum Bhimtâl Kemaonensem, in palude prope Moradabad, in rivo Rajhéra, necnon in rivo Sote, sive Yar Wuffadar dicto, prope Budaon Rohillarum, semper foliis plantarum aquaticarum natantibus adhaerens" [lives in Bhimtâl lake of Kumaon, in the marshes near Moradabad, in the Rajhéra river, and also in the Sote river, or Yar Wuffadar as often called, near Budaon Rohilla, always adhering to the floating leaves of aquatic plants]
Remarks The number of specimens was not noted in Benson's original description but there was clearly more than one. Annandale et al. (1921: Fig. 18B) illustrated the radula of this species, and noted the widespread but sporadic occurrence of this species throughout India and Sri Lanka (see also Subba Rao, 1989). Walther et al. (2006) remarked that specimens

of *Ferrissia verruca* from Thailand are suspiciously similar to *F. fragilis* (Tryon, 1863) [= *F. californica* (Rowell, 1863)], an introduced species from North America, although they have not yet been shown to be conspecific.

Superorder EUPULMONATA

Order AMPHIPULMONATA

Order ELLOBIIDA

Superfamily ELLOBIOIDEA

Family ELLOBIIDAE

Subfamily PYTHIINAE

Genus *Pythia* Röding, 1798

***Scarabus triangularis* Benson, 1836**

Accepted as *Pythia plicata* (A. Férussac, 1821); *Scarabus plicatus* Férussac, 1821: 101

Scarabus triangularis Benson, 1836a: 354
Type Material UMZC I.102105, **Fig. 50 C** (one of 11 syntypes from the R. McAndrew collection labelled "*Pythea Triangularis* Bens., Bens. col., Calcutta"); NHMUK 1841.7.23.21 (syntype presented by Dr Thomas Horsfield labelled "*Scarabus triangularis* Benson, India")
Original measurements: "Length 0.9. Breadth 0.65 inch."
Type locality India and Bangladesh: part of a collection "chiefly made in the hills on the N.E. Frontier of Bengal"; also Calcutta: "the alluvial island opposite Fort William"
Remarks The number of specimens examined was not noted in Benson's original description, which was based on material in the Museum of the Asiatic Society and also material collected by himself and Dr J.T. Pearson at Fort William "under decayed vegetation, and under bundles of the *hoogla* grass cut down for sale". Benson noted that the specimens in the Asiatic Society collection were all weathered and "a livid purple colour" but that this was "amply compensated for by an excursion which I made with Dr Pearson… during which that gentleman discovered the live animal [and] we made a large collection in a short space of time" (Benson, 1836a: 354). NHMUK 1841.7.23.21 was transferred from the Asiatic Society to the EIC's India Museum in London and corresponds with the specimen listed by Pearson (1840: 730). *Scarabus* Montfort, 1810 is a junior synonym of *Pythia* Röding, 1798 and *P. triangularis* is a junior synonym of *Pythia plicata* (A. Férussac, 1821). This species also inhabits mangrove and Nipa palm forests and has been identified from coastal areas of South and Southeast Asia, Java, Sumatra and Borneo (Brandt, 1974).

Family CARYCHIIDAE[25]

Genus *Carychium* O.F. Müller, 1773

***Carychium indicum* Benson, 1849**

Carychium indicum Benson, 1849a: 194; Nevill, 1878: 227
Type material UMZC I.102335.A, **Fig. 50 D** (one of over 50 syntypes in the R. McAndrew collection labelled "Landour" [printed label])
Original measurements: "Long. 1½ mill., diam. 2/3 mill."
Type locality India: "Hab. ad Simla et Landour montibus sub-Himalayanis, foliis putridis adhaerens." [lives at Simla and Landour in the Himalayan foothills, adhering to dead leaves]
Remarks Benson (1849a: 195) stated that he would have adopted Hutton's manuscript name *bidens* "were it truly descriptive of the shell", but instead he proposed the name *indicum* for this species, found near Simla and Landour. Sherborn's (1927) inclusion of *Carychium bidens* Benson, 1849 is therefore an error. UMZC I.102335 is not labelled as coming from the Benson collection, but the name was added to McAndrew's *Catalogue* at a late stage in the manner of the rest of Benson's material, and we accept therefore accept it as part of the Benson collection. This species has recently been recorded from Bhutan (Gittenberger et al., 2017a, c).

***Carychium boysianum* Benson, 1864**

Accepted as *Carychium indicum* Benson, 1849; Benson, 1849a: 194

Carychium boysianum Benson 1864c: 210
Type material UMZC I.102435.H, **Fig. 50 E** (holotype, see below for details)
Original measurements: "Alt. 2, diam. vix 2/3 mill."
Type locality India: "Habitat prope urbem Agra, ad ripas fluminis Jumna" [lives near the town of Agra, on the banks of the Jumna River]
Remarks There are no specimens from the Benson collection labelled *Carychium boysianum*, but a specimen of *Carychium* was present in sample of '*Achatina balanus*' [UMZC I.102435.A–G] from Taj Agra. This mixed sample was contained in a quill (see Naggs, 1997: Fig. 7), on which was written "*Balanus Achatina* & *Auricula Carychium* Taj Agra". This is consistent with Benson's account of the discovery of this species: "about the year 1843, Capt. W.J. Boys took specimens of *Achatina Balanus* at the Taj, near Agra, in company with a minute *Carychium*, very similar to the Himalayan species *C. indicum*, B. ..."

(Benson, 1864a: 137). He distinguished *C. boysianum* from *C. indicum* "by its more elongated cylindrical and less rapidly attenuate form, and its flatter whorls, also by the narrower and more acute aperture, the right lip being straighter and less convex, and by the expanded parietal callus" (Benson, 1864c: 210). The UMZC specimen has a broken aperture and seems to be an immature specimen of *C. indicum* (Adrienne Jochum, *pers. comm.*). It is clearly not a synonym of '*Bifidaria huttoniana'*, which is how it was treated by Gude (1914a: 291).

Genus *Coilostele* Benson, 1864 [26]

Coilostele scalaris Benson, 1864

Coilostele scalaris Benson, 1864a: 136; Hanley and Theobald, 1876 [in 1870–1876]: 63, Pl. 156, Fig. 5; Theobald, 1878: 147; Nevill, 1878: 162; Pilsbry, 1908: 339, Pl. 50, Fig. 3; Gude, 1914a: 376; Ramakrishna et al., 2010: 147

Original measurements: "Long. 3, diam. vix 1 mill. Apert. 2/3, lata ½ mill."

Material UMZC I.103255.A, **Fig. 50 F** (one of 10 shells from the R. McAndrew collection labelled "Ind.", no locality or collection data; three of these are *Cecilioides*)

Type locality India: "ad Humeerpore, Bundelkhund, prope ripas fluviorum Jumna et Betwa" [at Humeerpore, Bundeklhund, near the banks of the rivers Jumna and Betwa]

Remarks Benson collected several specimens of this species over a period of years: "I discovered this shell, in October 1826, in the sand of the Betwa river ... and after a few days I took dead specimens, with the same minute *Achatina*, among the clay-covered roots of a large tree ... In January 1839 I took, I believe, a single specimen among the porphyritic and greenstone rocks of the singular crater-like hill of Khaneen, sixteen miles south of Hansi, in the Delhi district ..." He also knew that Hutton had found specimens in the "exuviae of the River Ganges" sometime before 1853. This is the type species of *Coilostele* by monotypy. Family attribution follows Pilsbry (1946: 1051). Naggs (1997: 65–72) provided a discussion about the generic affinities of *Coilostele*, figuring the radula and jaw and confirming inner whorl resorption, a feature characteristic of ellobiids.

Order STYLOMMATOPHORA

Suborder ACHATININA

["ACHATINOID CLADE"]

Superfamily ACHATINOIDEA [27]

Family ACHATINIDAE

Subfamily CECILIOIDINAE

Genus *Cecilioides* A. Férussac, 1814 [28]

Subgenus *Cecilioides* A. Férussac, 1814

Achatina spiculum Benson, 185

Tentatively accepted as
Cecilioides (*Cecilioides*) *acicula* (O.F. Müller, 1774);
Buccinum acicula Müller, 1774, 150

Achatina spiculum Benson, 1856c: 434

Type material not located

Original measurements: "Long. 4, lat. 1 mill.; long. apert. 1 1/3 mill."

Type locality Cape Verde Islands: "Hab. ad insulam St Vincentii sub lapide" [lives on the island of São Vicente, under rocks]

Remarks Benson mentioned just one shell: "A single specimen was found by Mr. [E.L.] Layard on the west side of the island, under the Duke's Head Mountain". An annotation in Benson's handwriting on Thomas Hutton's copy of Benson (1856c) states: "specimen returned to Layard". However, no specimens labelled as *A. spiculum* could be traced amongst material identified as coming from Layard's collection. Wollaston (1878: 517) claimed that *spiculum* differs from *Cecilioides acicula* in being smaller and narrower with a paler and thinner shell but recent authors have tentatively included it in the synonymy of *C. acicula* (e.g. Groh, 1983; 2012: 38).

Achatina veru Benson, 1856

Accepted as *Cecilioides* (*Cecilioides*) *acicula* (O.F. Müller, 1774); *Buccinum acicula* Müller, 1774, 150

Achatina veru Benson, 1856c: 435

Type material not located

Original measurements: "Long. 4½, diam. 1 mill.; long. apert. 1½ mill."

Type locality St Helena: "Hab. in insula Sanctae Helenae" [lives on the island of St Helena]

Remarks Benson mentioned one specimen: "A single specimen was found by Mr. [E.L.] Layard with *Bulimus compressilabris*". An annotation in Benson's handwriting on Thomas Hutton's copy of Benson (1856c) states: "returned to Layard". However, no specimens labelled as *A. veru* could be traced amongst material identified as coming from Layard's collection. Wollaston (1878: 555) thought it likely that this species had been introduced to the island "along with a consignment of plants" and he likened it to the European *Cecilioides acicula* (O.F. Müller, 1774), an attribution supported by Crowley and Pain (1977: 549),

although they also wondered whether *A. veru* was conspecific with the subulinid *Opeas goodalli* [i.e. *Opeas hannense* (Rang, 1831)]. Smith (1892) examined Benson's type and thought that it was identical with *Caecilioides gundlachi* (L. Pfeiffer, 1850), which Crowley and Pain (1977: 549) listed as a synonym of *C. acicula*.

Subfamily GLESSULINAE

Genus *Glessula* E. von Martens, 1860

Glessula arthuri (Benson, 1864)

Achatina arthuri Benson, 1864c: 209
Achatina (*Electra*) *arthuri* Benson; Pfeiffer, 1868 [in 1847–1877]: 224; Hanley and Theobald, 1870 [in 1870–1876]: 17, Pl. 36, Fig. 3
Stenogyra (*Glessula*) *arthuri* (Benson); Nevill, 1878: 167
Glessula arthuri (Benson); Pilsbry, 1909 [in 1908–1909], 79, Pl. 10, Fig. 7 (as synonym of *G. orophila*); Gude, 1914a: 423; Ramakrishna et al., 2010: 152; Raheem et al., 2014: 119, Fig. 75A
Type material NHMUK 1946.10.16.35, **Fig. 51 A** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 119, Fig. 75A) from the R. McAndrew collection, presented by the UMZC, labelled "*Achatina arthuri* Benson, Mahableshwar, Benson coll."); NHMUK 1946.10.16.36–37 (two paralectotypes from the same lot)
Original measurements: "Long. 19, diam. 10, apert. long. 8 mill."
Type locality India: "Habitat ad Neher (Malcolm Peth) montibus Mahabaleshwar dictis" [lives at Neher (Malcom Peth) in the so-called Mahabaleshwar Hills]
Remarks Benson (1864c: 209–210) mentioned four specimens: "A single specimen, in a state too imperfect for description, was taken by my son [Lieut. Arthur E. Benson] ... at the hill-station in question [Malcolm Peth, Mahabaleshwar] ..." "I sent a rough sketch to the Rev. S.B. Fairbank, who searched carefully for it, and has kindly furnished me with three living specimens ...". It is likely that the specimens from Benson's collection now in the NHM are the Fairbank shells. Pilsbry (1909: 79) included this species in the synonymy of *G. orophila* but Gude (1914a: 424) maintained that it could be distinguished by the absence of impressed transverse striae and in being costulate-striate and less shining.

Glessula botellus (Benson, 1860)

Achatina botellus Benson, 1860h: 465; Pfeiffer, 1868 [in 1847–1877]: 226
Achatina (*Electra*) *botellus* Benson; Hanley and Theobald, 1870 [in 1870–1876]: 16, Pl. 35, Fig. 4
Stenogyra (*Glessula*) *botellus* (Benson); Nevill, 1878: 168
Glessula botellus (Benson); Pilsbry, 1909 [in 1908–1909], 78: Pl. 10, Fig. 6; Gude, 1914a: 422; Ramakrishna et al., 2010: 154 (as "*G. bottelus*"); Raheem et al., 2014: 120–121, Fig. 75E–F
Type material NHMUK 1946.10.16.43, **Fig. 51 B** (neotype designated by Raheem and Naggs (Raheem et al., 2014: 120–121, Fig. 75E) from the R. McAndrew collection, presented by the UMZC)
Original measurements: "Long. 18, diam. 7 ½ mill.; apert. 7 mill. longa, 3 2/3 lata."
Other material UMZC I.103375 (single shell from the R. McAndrew collection labelled "*Oleacina* (*Electra*) *Botellus* Var. B, Bens. Col., Nilgherries").
Type locality India: "in montibus Nilgherries. Detexit T. Jerdon" [In the Nilgiri Hills. Discovered by T. Jerdon]
Remarks Benson (1860h: 465) based his description on a single shell collected by Thomas Jerdon. The neotype designated by Raheem and Naggs (Raheem et al., 2014: 120–121) was selected in order to clarify the taxonomic status of the species, since they were unable to distinguish which of the two NHM specimens was Benson's holotype. This species is endemic to the Western Ghats.

Glessula chessoni (Benson, 1860)

Achatina chessoni Benson, 1860h: 462; Pfeiffer, 1868 [in 1847–1877]: 222
Achatina (*Electra*) *chessoni* Benson; Hanley and Theobald, 1870 [in 1870–1876]: 9, Pl. 17, Fig. 8
Stenogyra (*Glessula*) *chessoni* (Benson); Nevill, 1878: 167
Glessula chessoni (Benson); Pilsbry, 1909 [in 1908–1909], 68, Pl. 11, Fig. 5; Gude, 1914a: 388; Ramakrishna et al., 2010: 156; Raheem et al., 2014: 122, Fig. 76E–F
Type material NHMUK 1946.10.16.16, **Fig. 51 C** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 122, Fig. 76E) from the R. McAndrew collection, presented by the UMZC, labelled "*Glessula chessoni*, Type?, India, Benson coll."); NHMUK 1946.10.16.17–20, **Fig. 51 D** (one of four paralectotypes from the same lot; see Naggs, 1997: Fig. 8)
Original measurements: "Long. 37, diam. 15 mill.; apert. 14 mill. longa, 8 lata."
Type locality India: "Habitat in montibus Mahabaleshwar. Detexit J. Chesson" [lives in the Mahabaleshwar hills. Discovered by J. Chesson]
Remarks The number of specimens provided by John Chesson was not noted in Benson's original description but there were clearly several shells because he mentioned an un-named variety that was more slender

("33 mill. in length by 12 in breadth"). This species is endemic to the Western Ghats (Raheem et al., 2014).

Glessula crassilabris (Benson, 1836)

Achatina crassilabris Benson, 1836a: 353; Pfeiffer, 1848 [in 1847–1877]: 261; Reeve, 1849 [in 1848–1850], 5 (*Achatina*): pl. 21, species 81
Achatina (*Electra*) *crassilabris* Benson; Hanley and Theobald, 1870 [in 1870–1876]: 17, Pl. 36, Fig. 1
Stenogyra (*Glessula*) *crassilabris* (Benson); Nevill, 1878: 170
Glessula crassilabris (Benson); Pilsbry, 1909 [in 1908–1909]: 96, pl. 10, figs 14, 15; Gude, 1914a: 426; Ramakrishna et al., 2010: 157
Type material UMZC I.102430, **Fig. 51 E** (syntype from the R. McAndrew collection labelled "*Electra Crassilabris* Bens., Bens. col., Bengal". Another label written by Martin Bishop indicates that this was the specimen figured by Reeve, 1849 [in 1848–1850], 5 (*Achatina*): pl. 21, species 81)
Original measurements: "Long. 0.7. Lat. 0.3 poll."
Other material NHMUK 20200349 (two shells labelled "*Glessula crassilabris* Benson, Type, N.E. Bengal", with the relevant entry from Nevill's Handlist (1870: 170) excised as a label); NHMUK 20200350 (two shells transferred from the Indian Museum labelled "*Glessula crassilabris* B., type, Khasi, M.10695/2")
Type locality Bangladesh: part of a collection "chiefly made in the hills on the N.E. Frontier of Bengal"
Remarks The number of specimens examined was not noted in Benson's original description, which was based on material in the Museum of the Asiatic Society acquired from an expedition to "Sylhet, Cherra Poonji and the Khasi Hills" (Pearson, 1833). Nevill (1878: 170) listed two shells in the Indian Museum labelled "North-East Bengal (type), ex. c. As. Soc., Bengal". These are likely to be syntypes. The status of the two NHM lots, both of which consist of two specimens and claim to be "types", is unclear. NHMUK 20200350 has an Indian Museum registration number and was transferred to the NHM in 1924. However, in an accompanying register, the entry for this lot lists Godwin-Austen as the "Collector or Donor" and the shells are significantly smaller than the measurements provided in the original description. NHMUK 20200349 is rather more enigmatic; it is not clear whether these specimens originated from the Indian Museum, but they are clearly associated with Nevill's handlist and are consistent with the measurements provided by Benson.

Glessula facula (Benson, 1860)

Achatina facula Benson, 1860h: 466; Pfeiffer, 1868 [in 1847–1877]: 224
Achatina (*Electra*) *facula* Benson; Hanley and Theobald, 1870 [in 1870–1876]: 16, Pl. 35, Fig. 1
Glessula facula (Benson); Pilsbry, 1909 [in 1908–1910], 77: pl. 10, figs 8, 9; Gude, 1914a: 421; Ramakrishna et al., 2010: 159
Type material not located
Original measurements: "Long. 18, diam. 8 mill. ; apert. 7 mill. longa, 4½ lata."
Type locality India: "Habitat in montibus Nilgherries, T. Jerdon" [Lives in the Nilgiri Hills]
Remarks The number of specimens provided by Thomas Jerdon was not noted in Benson's original description. No authentic Benson material can be traced but the specimen figured by Reeve (1850 [in 1848–1850], Pl. 21, Fig. 102) was collected from the Nilgiri Hills. However, neither this figure nor Benson's original description are sufficient for establishing the identity of *G. facula*, which was therefore considered a *nomen dubium* by Raheem et al. (2014: 123).

Glessula fairbanki (Benson, 1865)

Achatina fairbanki Benson, 1865b: 14; Pfeiffer, 1868 [in 1847–1877]: 232
Achatina (*Electra*) *fairbanki* Benson; Hanley and Theobald, 1870 [in 1870–1876]: 9, Pl. 18, Fig. 3
Glessula fairbanki (Benson); Pilsbry, 1908 [in 1908–1910], 63: Pl. 9, Fig. 7; Gude, 1914a: 383; Ramakrishna et al., 2010: 159; Raheem et al., 2014: 123, Fig. 77D–E
Type material NHMUK 1946.10.16.41, **Fig. 52 A** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 123) from the R. McAndrew collection, presented by the UMZC, labelled "*Glessula fairbanki* Bens., India, Benson Coll."); NHMUK 1946.10.16.42, **Fig. 52 B** (paralectotype from the same lot)
Original measurements: "Long. 12, lat. 4 mill. Apert. long. 3, lat. 2½ mill." (Benson, 1865b: 14)
Type locality India: "Habitat in montibus Mahabaleshwar" [lives in the Mahabaleshwar hills]
Remarks The number of specimens provided by the Rev. S.B. Fairbank was not mentioned in Benson's original description. Beddome (cited by Pilsbry, 1908 [in 1908–1909]: 64) considered that this species is doubtfully distinct from *G. hebes*, but both species were based on shells that were not fully mature. This species, if distinct, is endemic to the Western Ghats (Raheem et al., 2014).

Glessula leptospira (Benson, 1865)

Achatina leptospira Benson, 1865b: 14; Pfeiffer, 1868 [in 1847–1877]: 233
Achatina (*Electra*) *leptospira* Benson; Hanley and Theobald, 1870 [in 1870–1876]: 16, Pl. 35, Fig. 2
Stenogyra (*Glessula*) *leptospira* (Benson); Nevill, 1878: 171
Glessula leptospira (Benson); Pilsbry, 1909 [in 1908–1910]: 65, Pl. 12, Fig. 2; Gude, 1914a: 410; Ramakrishna et al., 2010: 164
Type material NHMUK 1946.10.16.13, **Fig. 51 F** (syntype from the R. McAndrew collection, presented by the UMZC, labelled "*Achatina leptospira* Bens., ?Type, Univ. Mus. Cambridge, Benson Coll.", no locality data)
Original measurements: "Long. 16, lat. 6 mill." (Benson, 1865b: 14)
Other material NHMUK 1888.12.4.1233–1235 (three shells from the W. Theobald collection labelled "*Glessula leptospira* Benson, Sumeysur Hills, N. of Gorakpur on Nepal boundary = Type loc.")
Type locality India: "Habitat in montibus Soomeysur dictis. Teste W. Theobald" [lives in the mountains known as Soomeysur, according to W. Theobald]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. Nevill (1870: 171) listed a specimen in the Indian Museum labelled "Goomeysur Hill (typical); coll. W. Theobald Esq.". Pilsbry (1909 [in 1908–1909]: 66) wondered whether this species might prove to be a form of *Glessula notigena*.

Glessula notigena (Benson, 1860)

Achatina notigena Benson, 1860h: 462; Pfeiffer, 1868 [in 1847–1877]: 229
Achatina (*Electra*) *notigena* Benson; Hanley and Theobald, 1870 [in 1870–1876]:17, Pl. 35, Figs 8, 9
Glessula notigena (Benson); Pilsbry, 1909 [in 1908–1910], 66: pl. 12, figs 3, 4, 9; Gude, 1914a: 412; Ramakrishna et al., 2010: 167; Raheem et al., 2014: 127–128, figs 81F and 82A
Type material NHMUK 1946.10.16.73, **Fig. 52 C** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 127–128; Fig. 81F) from the R. McAndrew collection, presented by the UMZC, labelled "*A. notigena* Benson, Type?, Mahabaleshwar (W.Ghat's India), Benson collection" NHMUK 1946.10.16.74, **Fig. 52 D** (one of four paralectotypes from the same lot)
Original measurements: "Long. 20, diam. 7 mill.; apert. 6 mill. longa, vix 4 lata."
Other material EXEMS: 1720/1909/D31/64 (single shell from the J.E. Linter collection labelled "*G. notigena* Ben., India, W.T." [William Theobald])
Type locality India: "Habitat in montibus Mahabaleshwar cum praecedente, teste J. Chesson; necnon prope Bombay, W. Theobald" [lives in the Mahabaleshwar Hills with the preceding species [*Glessula chessoni*], according to J. Chesson; as well as near Bombay, W. Theobald]
Remarks The number of specimens provided by John Chesson and William Theobald was not mentioned in Benson's original description, but there were clearly at least two. This species is endemic to India, where it is retricted to the northern part of the Western Ghats and to East and Northeast India (Raheem et al., 2014).

Glessula orobia (Benson, 1860)

Achatina orobia Benson, 1860h: 461; Pfeiffer, 1868 [in 1847–1877]: 224
Achatina (*Electra*) *orobia* Benson; Hanley and Theobald, 1870 [in 1870–1876]: 9, Pl. 18, Fig. 7 + var., Fig. 8
Stenogyra (*Glessula*) *orobia* (Benson); Nevill, 1878: 170
Glessula orobia (Benson); Pilsbry, 1909 [in 1908–1910], 96: Pl. 10, Fig. 16; Gude, 1914a: 427; Ramakrishna et al., 2010: 168
Type material NHMUK 1946.10.16.82–83, **Fig. 53 A** (one of two syntypes from the R. McAndrew collection, presented by the UMZC, labelled "Darjeeling Assam, India")
Original measurements: "Long. 11, diam. 5 mill.; apert. 4 mill. longa, 3 lata."
Other material NHMUK 1860.6.27.37 (two shells presented by W.T. Blanford labelled "*Achatina orobia* Benson, Darjiling")
Type locality India: "Habitat ad Sinchul et Darjiling (alt. Ped. 8500 et 7000). Teste W.T. Blanford" [lives at Sinchul and Darjiling (altitude of 8500 and 7000 feet), according to W.T. Blanford]
Remarks The number of specimens provided by William Blanford was not noted in Benson's original description. Specimens from "Darjeerling" are listed in Robert McAndrew's *Catalogue* and these are presumably the same shells that were transferred from the UMZC to the NHM. In addition to the Indian localities mentioned above, this species is now known from Nepal (Budha et al., 2015, 2017a).

Glessula pachycheila (Benson, 1853)

Achatina pachycheila Benson, 1853c: 94; Pfeiffer, 1859: 608
Stenogyra (*Glessula*) *pachycheila* (Benson); Nevill, 1878: 172
Glessula pachycheila (Benson); Pilsbry, 1908 [in 1908–1910]: 58; Gude, 1914a: 409
Type material not located
Original measurements: "Axis 11, diam. 5 mill."
Other material NHMUK 20190446 (single shell labelled "(*Glessula*) *Pachycheila* var. according to Bens, Ceylon, 37. Ex Layard"); NHMUK 1946.10.16.61–64 (four shells from the R. McAndrew collection, presented by the UMZC, labelled "Heneratgodde, Sri Lanka". Two associated labels read "do not agree with description WTB" [W.T. Blanford] and "Appear to be *pachycheila* Bs. v. *taprobanica* Pils. the best shell nearly typical HAP" [H.A. Pilsbry]; UMZC I.103970 (four shells labelled "D7. (3), D2. (1), *Achatina* conf. *pachychila* Pfr., 7 Bootella, 2 Kandookere, F. [?] L." [Fred ? Layard]
Type locality Sri Lanka: "Hab. ad Heneratgodde" [lives at Heneratgodde]
Remarks The number of specimens collected by Edgar Layard was not noted in the original description. Although the NHM shells are from the type locality, both they and the specimens in the UMZC, which are very similar, are substantially smaller than the measurements given by Benson and thus none of them appear be syntypes of Benson's *pachycheila*. They almost certainly belong to another species. It is possible that Benson made an error with his measurements but there is nothing to support this assertion. The UMZC shells have no labels to indicate that they came from the Benson collection, and although there is a link to Layard the poor handwriting makes it is unclear whether this was Frederick or Edgar. The UMZC shells are also not from the type locality, Heneratgodde, in the southwest of Sri Lanka but from localities in the southeast and central regions of the island. In view of these uncertainties, it seems safest to regard *Achatina pachycheila* as a *nomen dubium*.

Glessula panaetha (Benson, 1860)

Achatina panaetha Benson, 1860b: 384; Pfeiffer, 1868 [in 1847–1877]: 226
Achatina (*Electra*) *panaetha* Benson; Hanley and Theobald, 1870 [in 1870–1876]: 17, Pl. 36, Fig. 2
Stenogyra (*Glessula*) *panaetha* (Benson); Nevill, 1878: 171
Glessula panaetha (Benson); Gude, 1914a: 406
Type material NHMUK 1954.6.2.184–185, **Figs 52 E–F** (two syntypes from the J.S. Hawkins collection labelled "*Achatina panaetha* Benson, Matelle, Ceylon, F. Layard, 1862"); NHMUK 1946.10.16.27–29 (three shells from the R. McAndrew collection, presented by the UMZC, registered as "*Glessula panaetha*, Ceylon, Benson coll." [specimens missing])
Original measurements: "Long. 13; diam. 6 mill.; apert. 5 mill. longa, 3 lata."
Type locality Sri Lanka: "Habitat ad Ellegamme Nalande, et aliunde in pago Matelle" [lives at Ellegamme Nalande, and elsewhere in the district of Matelle]
Remarks The number of specimens provided by Frederick Layard was not noted in Benson's original description. The three specimens from the Benson collection that were transferred to the NHM from the UMZC cannot be located. The label accompanying the two shells from the J.S. Hawkins collection could be taken to mean that they originated from Frederick Layard, but they correspond with a manuscript list of specimens sent to Hawkins by Benson in November 1862 (MSS_ZOO_HAW). We therefore accept these specimens as syntypes. Nevill (1878: 171) listed two specimens in the Indian Museum labelled "Nalande, Matelle (typical); ex. c. F.L. Layard, Esq.". Pilsbry (1908 [in 1908–1910]: 56) included this species in the synonymy of *Glessula nitens* (Gray, 1825), whereas Gude (1914a: 406) maintained its distinction noting that *panaetha* has a wider last whorl and a higher aperture.

Glessula parabilis (Benson, 1856)

Achatina parabilis Benson, 1856d: 96; Pfeiffer, 1859 [in 1847–1877]: 606
Achatina (*Electra*) *parabilis* Benson; Hanley and Theobald, 1870 [in 1870–1876]: 17, Pl. 35, Fig. 7
Stenogyra (*Glessula*) *parabilis* (Benson); Nevill, 1878: 171
Glessula parabilis (Benson); Pilsbry, 1908 [in 1908–1910], 54: Pl. 7, Fig. 4; Gude, 1914a: 402
Type material NHMUK 1946.10.16.84, **Fig. 53 B** (syntype from the R. McAndrew collection, presented by the UMZC, labelled "*Oleacina (Electra) parabilis* Bens., Bens. col., Ceylon")
Original measurements: "Long. 20, diam. 10, long. Apert. 9, lat. 5 mill."
Type locality Sri Lanka: "Hab. in Insula Ceylon. Teste F. Layard" [lives on the Island of Ceylon, according to F. Layard]
Remarks The number of specimens provided by Frederick Layard was not noted in Benson's original description.

Glessula praelustris (Benson, 1860)

Achatina praelustris Benson, 1860h: 462; Pfeiffer, 1868 [in 1847–1877]: 221
Achatina (*Electra*) *praelustris* Benson; Hanley and Theobald, 1870 [in 1870–1876]: 9, Pl. 17, Fig. 6 + var., Fig. 7
Stenogyra (*Glessula*) *praclustris* [sic] (Benson); Nevill, 1878: 170
Glessula praelustris (Benson); Pilsbry, 1909 [in 1908–1910]: 68, pl. 9, figs 15, 16; Gude, 1914a: 386; Ramakrishna et al., 2010: 170
Type material NHMUK 1946.10.16.55, **Fig. 53 C** (one of three syntypes from the R. McAndrew collection, presented by the UMZC, labelled "Orissa, India, Theobald, Unive. Mus. Cambridge")
Original measurements: "Long. 33, diam. 17 mill.; apert. 15 mill. longa, 9 lata."
Type locality India: "Habitat in provincia Orissa prope Midnapore, Balasore, et Cuttack. Teste W. Theobald" [lives in the province of Orissa near Midnapore, Balasore, and Cuttack, according to W. Theobald]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description, in which he also remarked "It was found… in Mangoe topes, both in the hills and plains". Nevill (1870: 170) listed a specimen in the Indian Museum labelled "Midnapore; coll. W. Theobald Esq. (As. Soc. Bengal)".

Glessula pyramis (Benson, 1860)

Achatina pyramis Benson, 1860h: 463; Pfeiffer, 1868 [in 1847–1877]: 226
Achatina (*Electra*) *pyramis* Benson; Hanley and Theobald, 1870 [in 1870–1876]: 9, Pl. 18, Fig. 6
Stenogyra (*Glessula*) *pyramis* (Benson); Nevill, 1878: 169
Glessula pyramis (Benson); Godwin-Austen, 1875d: 3; Pilsbry, 1909 [in 1908–1910]: 92, Pl. 12, Fig. 1; Gude, 1914a: 409; Ramakrishna et al., 2010: 172
Type material NHMUK 1946.10.16.65, **Fig. 53 D** (syntype from the R. McAndrew collection, presented by the UMZC, labelled "Teria Ghat")
Original measurements: "Long. 15, diam. 6 mill.; apert. 5 mill. longa 2½ lata."
Type locality India: "Habitat at Teria Ghât Monitium Khasia. Detexit. W. Theobald" [lives at Teria Ghât, Khasia Hills. Discovered by W. Theobald]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. Godwin-Austen (1875d: 3) regarded this species as a variety of *Glessula crassilabris*.

Glessula sarissa (Benson, 1860)

Achatina sarissa Benson, 1860h: 463; Pfeiffer, 1868 [in 1847–1877]: 234
Achatina (*Electra*) *sarissa* Benson; Hanley and Theobald, 1870 [in 1870–1876]: 17, Pl. 35, Fig. 10
Stenogyra (*Glessula*) *sarissa* (Benson); Nevill, 1878: 170
Glessula sarissa (Benson); Pilsbry, 1909 [in 1908–1910]: 93, Pl. 12, Fig. 11; Gude, 1914a: 412; Ramakrishna et al., 2010: 173; Raheem et al., 2014: 131–132, figs 85F and 86A
Type material NHMUK 1946.10.16.69, **Fig. 53 E** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 131–132, Fig. 85F) from the R. McAndrew collection, presented by the UMZC, labelled "Bengal, Bens. col.,"); NHMUK 1946.10.16.70–72, **Fig. 53 F** (one of three paralectotypes from the same lot)
Original measurements: "Long. 16, diam. 5 ½ mill.; apert. 5 mill. longa 3½ lata."
Type locality Bangladesh: "Habitat prope Comercolly, Bengaliae, ad ripas fluminis Gangis. Detexit Dr. Theodore Cantor" [lives near Comercolly, Bengal, on the banks of the Ganges river. Discovered by Dr Theodore Cantor]
Remarks The number of specimens provided by Cantor was not noted in Benson's original description.

Glessula scrutillus (Benson, 1860)

Achatina scrutillus Benson, 1860h: 463; Pfeiffer, 1868 [in 1847–1877]: 227
Achatina (*Electra*) s*crutillus* Benson; Hanley and Theobald, 1870 [in 1870–1876]: 9, Pl. 18, Fig. 1
Stenogyra (*Glessula*) *scrutillus* (Benson); Nevill, 1878: 170
Glessula scrutillus (Benson); Pilsbry, 1909 [in 1908–1910]: 81, Pl. 10, Fig. 17; Gude, 1914a: 427; Ramakrishna et al., 2010: 173; Raheem et al., 2014: 133, Fig. 86C
Type material a neotype (NHMUK_1888.12.4.1279, **Fig. 54 A**) is hereby designated from a shell in the W. Theobald collection labelled "*Electra scrutillus* Bens, Nerbudda Valley"). We have designated a neotype with the express purpose of clarifying the taxonomic status of *G. scrutillus* (see below).
Original measurements: "Long. 6 mill., diam. 2 2/3; long. Apert. 2½ mill."
Other material NHMUK 1946.10.16.54 (single shell from the R. McAndrew collection, presented by the UMZC, labelled "*Oleacina* (*Electra*) *scrutillus* Bens., Bens. col., Cuttack")
Type locality India: "Nerbudda Valley"

Original locality India: "Habitat in Provincia Orissa (Cuttack), necnon in valle superiore fluminis Nerbudde, Indiae Centralis. Detexit W. Theobald" [lives in Orissa Province (Cuttack), and also in the higher valley of the Nerbudda river, central India. Discovered by W. Theobald]

Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. The single surviving shell from the Benson collection labelled as this species (NHMUK 1946.10.16.54) is not *Glessula scrutillus*. The lectotype designated by Raheem and Naggs (Raheem et al., 2014: 133) is invalid because the specimen from Theobald's collection is not demonstrably part of Benson's type series. We therefore designate this specimen as the neotype. Nevill (1878: 170) listed two specimens in the Indian Museum labelled "Loc. ?; ex c. W. Theobald, Esq.". According to Ramakrishna et al. (2010), *G. scrutillus* is also known from Kerala (Malabar).

Glessula serena (Benson, 1860)

Achatina serena Benson, 1860b: 384; Pfeiffer, 1868 [in 1847–1877]: 223

Achatina (*Electra*) *serena* Benson; Hanley and Theobald, 1873 [in 1870–1876]: 33, Pl. 78, Fig. 8

Glessula serena (Benson); Pilsbry, 1908 [in 1908–1910]: 59, Pl. 6, Fig. 9; Gude, 1914a: 406

Type material NHMUK 1946.10.16.66–68, **Fig. 54 B** (one of three syntypes from the R. McAndrew collection, presented by the UMZC, labelled "*Glessula serena* Benson, Type, Ceylon")

Original measurements: "Long. 20–21; diam. 9–9½ mill.; apert. 9 mill. longa, 5½ lata."

Other material UMZC I.103300 (three shells from the R. McAndrew collection labelled "Ceylon", no collection data); NHMUK 1954.6.2.196–198 (three adult shells and one juvenile from the J.S. Hawkins collection labelled "*Achatina serena* Benson, ?Paratypes" in one hand and "19 *Achatina serena* Akurambodie" in another hand; a blue label is inscribed "*Achatina serena* Benson, Akurambodie, Ceylon, F. Layard 1862); NHMUK 20190439 (four adult shells and one juvenile labelled (possibly by Layard) "Hab. Akurambodie, Ceylon, *Achatina serena* Benson")

Type locality Sri Lanka: "ad Akurambodie, pago Matelle septentrionali" [At Akurambodie, northern Matelle district]

Remarks The number of specimens collected by Frederick Layard was not noted in Benson's original description, although there were clearly several since a range of measurements was provided. Gude (1914a: 407) suggested that "the shells on which Benson based his species must have been immature…" The largest UMZC specimen broadly agrees with the measurements provided by Benson, the other shells being smaller. Pilsbry (1908 [in 1908–1909]: 59) suggested that *G. serena* was doubtfully distinct from *G. ceylanica* (L. Pfeiffer, 1854) but "seems to be more slightly conic and smaller".

Glessula vadalica (Benson, 1865)

Achatina vadalica Benson, 1865b: 15; Pfeiffer, 1868 [in 1847–1877]: 229

Achatina (*Electra*) *Vadalica* Benson; Hanley and Theobald, 1870 [in 1870–1876]: 17, Pl. 35, Fig. 5

Stenogyra (*Glessula*) *vadalica* (Benson); Nevill, 1878: 168

Glessula vadalica (Benson); Pilsbry, 1908 [in 1908–1910]: 64, Pl. 9, Fig. 11; Gude, 1914a: 384; Ramakrishna et al., 2010: 179; Raheem et al., 2014: 138, Fig. 90A–B

Type material NHMUK 1946.10.16.24, **Fig. 54 C** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 138, Fig. 90A) from the R. McAndrew collection, presented by the UMZC, labelled "*Glessula vadalica*, Wadale, near Ahmednugger, India, Bens. coll."); NHMUK 1946.10.16.25–26, **Fig. 54 D** (one of two paralectotypes from the same lot)

Original measurements: "Long. 34, diam. 9 mill. Apert. long. 8, lat. 5 mill."

Type locality India: "Habitat ad Wadale prope Ahmednugger. Teste S.B. Fairbank" [lives at Wadale near Ahmednugger, according to S.B. Fairbank]

Remarks The number of specimens provided by the Rev. S.B. Fairbank was not mentioned in Benson's original description. Two specimens in the Indian Museum labelled "Wadalé, near Ahmednagar; coll. Rev. S.B. Fairbank" were listed by Nevill (1870: 168). This species is endemic to India.

Glessula veruina (Benson, 1853)

Achatina veruina Benson, 1853c: 94; Pfeiffer, 1859 [in 1847–1877]: 615

Stenogyra (*Glessula*) *veruina* (Benson); Nevill, 1878: 171

Glessula veruina (Benson); Pilsbry, 1908 [in 1908–1910]: 60; Gude, 1914a: 413, Fig. 130

Type material a neotype (NHMUK 1912.8.16.306, **Fig. 54 E**) is hereby designated using the single shell in the collection of E.L. Layard labelled "*Stenogyra veruina* Bens., Type, Ceylon Nalande"). We have designated a neotype with the express purpose of clarifying the taxonomic status of *A. veruina* (see below).

Original measurements: "Long. 25, diam. 5 mill."

Type locality Sri Lanka: "Hab. ad Nalande" [lives at Nalande]
Remarks The number of specimens provided by Edgar Layard was not noted in Benson's original description. Gude (1914a: 414) stated "The type unfortunately, appears to have been lost, as it cannot be found in the McAndrew collection at Cambridge." The specimen from Layard's collection in the NHM is not demonstrably part of Benson's type series and is hereby designated as the neotype.

Genus *Tortaxis* Pilsbry, 1906 [29]

Tortaxis erectus (Benson, 1842)

Achatina erecta Benson, 1842b: 487; Reeve, 1849 [in 1848–1850], 5 (*Achatina*): pl. 16, species 69
Stenogyra (*Opeas*) *erecta* (Benson); Nevill, 1878: 164
Tortaxis erectus (Benson); Naggs, 1992
Type material NHMUK 1991104A, **Fig. 54 F** (neotype designated by Naggs (1992) from the Cuming collection labelled "*erectus*, Nanking, M.C." [Museum Cuming])
Original measurements: none given
Other material NHMUK 1842.9.30.10–13 (four shells presented by the Hon. East India Company labelled "*Achatina erecta* Cantor, in the earth, stones, trees &c., Island of Chusan")
Type locality China: "Same localities, and in company with *Clausilia aculus* ["In the earth, on mossy stones, walls and trees"]; also "Common at Macao, where however *C. aculus* is not found"
Remarks Three lots of material have documentation to support their inclusion as part of the type series. These are held in the ZSI, NHM and the Oxford University Museum of Natural History. Theobald (1860: 92) recorded specimens of *Achatina erecta* from "Chusan, Macao, W.H. Benson" in the Museum of the Asiatic Society and Nevill (1878: 164) subsequently listed seven specimens in the Indian Museum from "Macao and Chusan (typical); donor Benson (As. Soc., Bengal)". This is a rare example of Benson's name appearing as the source of material donated to that institution, specimens that were subsequently transferred to the ZSI. However, Naggs (1992) pointed out that the ZSI specimens (M2262 4/4) were four large examples of *Allopeas gracile* (Hutton, 1834), whereas the NHM (4 specimens: NHMUK 1842.9.30.10–13) and Oxford (3 specimens: OUMNH.ZC.MO25558) specimens are *Paropeas achatinaceum* (L. Pfeiffer, 1846). The four well documented NHM syntypes (NHMUK 1842.9.30.10–13) were registered as *Achatina erecta* but these had subsequently been incorporated in the collections under *Bulimus fortunei* L. Pfeiffer, 1852. This discrepancy in species identity between the NHM and Oxford compared with the ZSI specimens can be attributed to the labels associated with the shell collections at the Asiatic Society having been mixed up and attempts to associate specimens with the appropriate names having introduced many errors (Grant et al., 1848; Naggs, 1997). The widely accepted, if mistaken identity of *Achatina erecta* was that adopted by Pilsbry who designated *Achatina erecta* as the type species of *Tortaxis* Pilsbry (1906: 5). This was based on a misinterpretation of *Achatina erecta* and in fact he was dealing with *Spiraxis mandarinus* L. Pfeiffer, 1855 (originally included as a nominal species but since synonymized with "*A. erecta*"). This confusion was resolved by a proposal to suppress *Achatina erecta* sensu Benson and designation of a neotype of *Achatina erecta* to conform with current usage sensu Pilsbry (Naggs 1992), a procedure accepted by the International Commission on Zoological Nomenclature (Opinion 1766).

Genus *Rishetia* Godwin-Austen, 1920 [30]

Rishetia hastula (Benson, 1860)

Achatina hastula Benson, 1860h: 461; Pfeiffer, 1868 [in 1847–1877]: 235
Achatina (*Electra*) *hastula* Benson; Hanley and Theobald, 1870 [in 1870–1876]: 9, Pl. 18, Fig. 4
Stenogyra (*Glessula*) *hastula* (Benson); Nevill, 1878: 169
Glessula hastula (Benson); Theobald and Stoliczka, 1872: 334; Pilsbry, 1909 [in 1908–1910], 93: Pl. 12, Fig. 12; Gude, 1914a: 414; Ramakrishna et al., 2010: 161
Rishetia hastula (Benson); Budha et al., 2015: 17
Material a neotype (NHMUK 1906.1.1.880, **Fig. 55 A**) is hereby designated from the W.T. Blanford collection labelled "*Achatina hastula* Bens., Darjiling"). We have designated a neotype with the express purpose of clarifying the taxonomic status of *A. hastula* (see below).
Original measurements: "Long. 12 ½, diam. 3½ mill.; long. Apert. 3½ mill."
Other material NHMUK 1906.2.2.357 (two shells from the W.T. Blanford collection labelled "*Glessula hastula* Bs., Darjiling"); NHMUK 1946.10.16.30–31 (two shells from the R. McAndrew collection, presented by the UMZC, labelled "*Glessula hastula*, Darjiling, Benson coll.")
Type locality India: "Habitat ad Pankabari, prope Darjiling, raro. Teste W.T. Blanford" [lives rarely at Pankabari, near Darjiling, according to W.T. Blanford]
Remarks The number of specimens provided by William Blanford was not noted in Benson's original

description. The Benson collection specimens transferred from the UMZC to the NHM are currently unlocated. In addition to the Indian localities described above, this species is now known from Burma and Nepal (Ramakrishna et al., 2010; Budha et al., 2015, 2017a).

Rishetia tenuispira (Benson, 1836)

Achatina tenuispira Benson, 1836a: 353; Pfeiffer, 1848 [in 1847–1877]: 262; Reeve, 1849 [in 1848–1850], 5 (*Achatina*): pl. 16, species 76; Theobald, 1857: 253; Benson, 1860h: 464; Blanford, 1865: 95
Achatina (*Electra*) *tenuispira* Benson; Hanley and Theobald, 1870 [in 1870–1876]: 17, Pl. 36, Fig. 8
Stenogyra (*Glessula*) *tenuispira* (Benson); Nevill, 1878: 169
Glessula tenuispira (Benson); Pilsbry, 1909 [in 1908–1910]: 88, pl. 9, figs 1, 4; Gude, 1914a: 378; Ramakrishna et al., 2010: 178
Rishetia tenuispira (Benson); Raheem et al., 2014: 138–139, Fig. 90C
Type material not located
Original measurements: "Long. 1 poll. circiter [approximately]. Lat. 0.55."
Other material UMZC I.102045, **Fig. 55 B** (syntype from the R. McAndrew collection labelled "*Subulina Tenuispira* Bens., Bens. col., Teria Ghat"); NHMUK 1946.10.16.1–7 (seven shells from the R. McAndrew collection, presented by the UMZC, labelled "*Glessula tenuispira* Bens., Pegu, Benson collection"); NHMUK 1879.12.26.77–78 (two shells transferred from the India Museum labelled "*Glessula tenuispira* Bens, Khasia Hills")
Type locality Bangladesh: part of a collection "chiefly made in the hills on the N.E. Frontier of Bengal".
Remarks The number of specimens examined was not noted in Benson's original description, which was based on material in the Museum of the Asiatic Society acquired from an expedition to "Sylhet, Cherra Poonji and the Khasi Hills" (Pearson, 1833). The UMZC specimen differs from Benson's description in being smaller and lacking the white transverse bands that are usually present on the later whorls (Raheem et al., 2014: 138–139), and the remaining ex-Benson material in the NHM is not from the type locality. The specimens transferred to the BM from the India Museum might have originated from the Asiatic Society, but unlike earlier transfers they are not explicitly labelled as such. According to Nevill (1878: 169), specimens "ex c. As. Soc., Bengal" were present in the Indian Museum in Calcutta (presumably now in the ZSI). *Achatina tenuispira* Benson, 1836 is the type species of *Rishetia* Godwin-Austen, 1920, itself the type genus of Rishetiinae Schileyko, 1999, here regarded as a synonym of the Glessulinae. *Ranibania* Schileyko & Kuznetsov, 1996 is a junior objective synonym of *Rishetia*. *Rishetia tenuispira* is widely distributed, occurring in India, Burma, Bangladesh and Nepal (Budha et al., 2015).

Subfamily OPEATINAE

Genus *Opeas* Albers, 1850

Bulimus compressilabris Benson, 1856

Accepted as *Opeas hannense* (Rang, 1831); *Helix* (*Cochlicella*) *hannensis* Rang, 1831: 41, Pl. 3, Fig. 8

Bulimus compressilabris Benson, 1856c: 434
Stenogyra compressilabris (Benson); Wollaston, 1878: 553
Opeas goodalli (Miller, 1822) (non Férussac, 1821); Smith, 1892
Opeas pumilum (L. Pfeiffer, 1840); Crowley and Pain, 1977: 550
Type material MANCH EE.7707, **Fig. 55 C** (one of two syntypes presented by E.L. Layard labelled "*Opeas compressilabris* Bens., St Helena")
Original measurements: "Long 6½, diam. 2 mill."
Type locality St Helena: "Hab. ad insulam Sanctae Helenae in horto publico non infrequens" [lives on the island of St Helena, not infrequently in public gardens]; "Mr Layard found it in a little artificial watercourse in the public gardens at the entrance of Jamestown"
Remarks The number of specimens was not noted in the original description. Benson examined Edgar Layard's collection in 1856, rendering his material part of the type series. This supports the assertion that some of the shells from the Layard collection in Manchester Museum should be regarded as syntypes (cf. McGhie, 2008). This species is a synonym of *Opeas hannense* (Rang, 1831), which has priority over *O. pumilum* (L. Pfeiffer, 1840); *Helix goodalli* Miller, 1822 is a junior homonym of *Helix goodalli* A. Férussac, 1821. *Opeas hannense* is a common hothouse species found in botanic gardens around the world. It is clearly an introduced species to St Helena (cf. Smith, 1892).

Subfamily THYROPHORELLINAE [31]

Genus *Eutomopeas* Pilsbry, 1946 [32]

Eutomopeas layardi (Benson, 1863)

Spiraxis layardi Benson, 1863a: 90; Pfeiffer, 1868 [in 1847–1877]: 190; Hanley and Theobald, 1873 [in 1870–1876]: 34, Pl. 79, Figs, 2, 3
Stenogyra layardi (Benson); Nevill, 1878: 174
Opeas Pilsbry, 1906: 158: pl. 4, figs 19, 20; pl. 16, figs 82, 83; Gude, 1914a: 360

Opeas (*Tomopeas*) *layardi* (Benson); Pilsbry, 1906: 123
Opeas (*Eutomopeas*) *layardi* (Benson); Pilsbry, 1946a: 105
Lamellaxis (*Eutomopeas*) *layardi* (Benson); Zilch, 1959: 349
Eutomopeas layardi (Benson); Schileyko, 1999; Naggs et al., 2002; Raheem et al., 2006a
Allopeas ? *layardi* (Benson); Naggs and Raheem, 2000: Fig. 117
Type material UMZC I.103270, **Fig. 55 D** (syntype from the McAndrew collection labelled "*Spiraxis Layardi* Bens., Bens. col., Ceylon")
Original measurements: "Long. 12½, diam. 4 mill.; apert. long. 4 diam. vix 2 mill."
Type locality Sri Lanka: "ad Moopana, Bootelle, &c., insulae Ceylon" [at Moopana, Bootelle, etc., Island of Ceylon]
Remarks The number of specimens collected by Frederick Layard was not noted in the original description, but the type series was collected from several different localities and specimens with the polished epidermis were said to be very scarce. The UMZC specimen appears to be a syntype, although the shell is a little shorter in length than specified by Benson. This species is the type of *Eutomopeas* Pilsbry, 1946, by typification of a replaced name (Pilsbry, 1946a: 105).

Subfamily COELIAXINAE

Genus *Chilonopsis* Fischer von Waldheim, 1848 [33]

Bulimus relegatus Benson, 1851

Accepted as *Chilonopsis helena* (Quoy & Gaimard, 1832); *Helix helena* Quoy and Gaimard, 1832: 111, Pl. 9, Fig. 8, 9

Bulimus relegatus Benson, 1851a: 264; Pfeiffer, 1853 [in 1840–1865], I.(13.$_1$), 72: pl. 20, figs 19–20
Material UMZC I.105005, **Fig. 55 E** (syntype [fossil shell] from the R. McAndrew collection associated with three labels: the oldest reads "*relegatus* Benson, Mag. nat Hist. 2nd series, St Helena. Lieut. Lefroy"; another in McAndrew's handwriting reads "*Bulimus Auris-Vulpina* Var. Chem., St Helena, Bens. col." and the most recent one reads "*Chilonopsis nonpareil elegans* (Benson), St Helena. Det T. Pain")
Original measurements: "Long. 30, diam. 14 mill.; long. apert. 14½, lat .9½ mill."
Type locality St Helena: "Hab. in insula St. Helenae, subfossilis. Lieut. Lefroy" [lives on the island of St Helena, subfossil. Lieut. Lefroy]
Remarks Wollaston (1878: 543–544) thought that *Bulimus relegatus* was a synonym of *Chilonopsis helena* (Quoy & Gaimard, 1832), a view supported by Crowley and Pain (1977: 560). This extinct species was endemic to St Helena.

Subfamily RUMININAE

Genus *Zootecus* Westerlund, 1887

Zootecus estellus (Benson, 1857)

Bulimus estellus Benson 1857a: 327; Pfeiffer, 1859 [in 1847–1877]: 462; Hanley and Theobald, 1870 [in 1870–1876]: 11, Pl. 22, Fig. 4
Pupa (*Cylindrus*) *insularis* var *estellus* Benson; Nevill, 1878: 195
Zootecus estellus (Benson); Gude, 1914a: 369; Ramakrishna et al., 2010: 185
Type material UMZC I.102820, **Fig. 56 A** (syntype from the McAndrew collection labelled "*Chondrus Estellus* Bens., Bens. col., Scinde")
Original measurements: "Long. 18, diam. 6 mill."
Other material NHMUK 1906.1.1.2259 (54 shells from the W.T. Blanford collection labelled "*Zootecus estellus* benson, Jessai Hill, Balmir (Barmer), Jodhpur, India")
Type locality Pakistan: "Hab. in regione Sindica. Teste Col. W.E. Baker" [lives in the Sind region, according to Col. W.E. Baker]
Remarks The number of specimens found by Col. Baker and provided to Benson by S.P. Woodward was not noted in the original description. This species is also known from Rajasthan (Ramakrishna et al., 2010).

Bulimus pertica Benson, 1857

Accepted as *Zootecus insularis* (Ehrenberg, 1831); *Pupa insularis* Ehrenberg, 1831 (pages unnumbered)

Bulimus pertica Benson 1857a: 328; Pfeiffer, 1859 [in 1847–1877]: 462; Hanley and Theobald, 1870 [in 1870–1876]: 11, Pl. 22, Fig. 7
Zootecus insularis var *pertica* (Benson); Pilsbry, 1906: 113, Pl. 26, Fig. 23
Zootecus pertica (Benson); Gude, 1914a: 370
Type material UMZC I.102825, **Fig. 56 B** (syntype from the R. McAndrew collection labelled "*Chondrus Pertica* Bens., Bens. col., Scinde")
Original measurements: "Long. 20, diam. 5 mill."
Type locality Pakistan: "Hab. in regione Sindica. Teste Col. W.E. Baker" [lives in the Sind region, according to Col. W.E. Baker]
Remarks The number of specimens found by Col. Baker and provided to Benson by S.P. Woodward was not noted in the original description. However, there may only have been one specimen since Pilsbry (1906: 113) and Gude (1914a: 370) refer to a comment by Nevill (1878: 195) stating that *pertica* is merely an

abnormal specimen of *Z. polygyratus* (Reeve, 1849). Both *Z. pertica* and *Z. polygyratus* are now included within *Zootecus insularis* (Ehrenberg, 1831).

Subfamily UNCERTAIN

Genus *Curvella* Chaper, 1885 [34]

Curvella puta (Benson, 1857)

Bulimus putus Benson, 1857a: 330; Theobald, 1857: 252; Pfeiffer, 1859 [in 1847–1877]: 502; Blanford, 1865: 94; Hanley and Theobald, 1873 [in 1870–1876]: 34, Pl. 80, Fig. 9
Hapalus putus (Benson); Nevill, 1878: 175
Curvella puta (Benson); Gude, 1914a: 351
Type material UMZC I.102795, **Fig. 55 F** (holotype from the R. McAndrew collection labelled "*Bulimus Misembrinus Putus* Benson, Bens. col., Tavoy, Birmah")
Original measurements: "Long. 7, diam. vix 5 mill.; long. apert. vix 4, diam. 2½ mill."
Other material NHMUK 1888.12.4.1003–1004 (two shells from the W. Theobald collection labelled "*Hapalus putus* Benson, Pegu"); EXEMS: 1720/190/D2/62 (single shell from the J.E. Linter collection labelled "*Hapalus putus* Bens, Pegu, Lower Burma")
Type locality Burma: "Hab. ad Tavoy. Teste W. Theobald" [lives at Tavoy, according to W. Theobald]
Remarks Benson based his description on a single worn specimen provided by William Theobald. Additional specimens from Theobald's collection survive in the NHM and the RAMM, Exeter, but both of these are labelled "Pegu" rather than the type locality.

Genus *Prosopeas* Mörch, 1876 [35]

Prosopeas haughtoni (Benson, 1863)

Spiraxis haughtoni Benson 1863a: 90; Pfeiffer, 1868 [in 1847–1877]: 189; Hanley and Theobald, 1870 [in 1870–1876]: 10, Pl. 19, Fig. 1
Stenogyra (*Prosopeas*) *haughtoni* (Benson); Nevill, 1878: 173
Prosopeas haughtoni (Benson); Pilsbry, 1906: 28, pl. 6, figs 76, 78, 79; Gude, 1914a: 364; Ramakrishna et al., 2010: 182; Rao et al., 2013: 133
Type material UMZC I.103425.A, **Fig. 56 C** (one of three syntypes from the R. McAndrew collection labelled "*Spiraxis Houghtoni* [subsequently corrected to *Haughtoni*], Bens. col., Andeman Ids")
Original measurements: "Long. 20–30, diam. 10–11 mill.; apert. long. 11, lat. 5 mill."
Type locality Andaman Islands: "ad Portum Blair insularum Andamanicarum" [at Port Blair, Andaman Islands]
Remarks The number of specimens examined was not noted in Benson's original description. He appears to have first examined shells collected by Dr Walker and was later supplied with better specimens by Major Haughton, who also sent a single specimen of the variety *oxynter* (see below). *Prosopeas haughtoni* is endemic to the Andaman Islands (Rao et al., 2013).

Prosopeas haughtoni oxynter (Benson, 1863)

Spiraxis haughtoni var. *oxynter* Benson 1863a: 90
Material UMZC I.103425.D, **Fig. 56 D** (single shell from the R. McAndrew collection, one of four labelled "*Spiraxis Houghtoni* [subsequently corrected to *Haughtoni*], Bens. col., Andeman Ids")
Original measurements: "Long. 30, diam. 8 mill."
Type locality Andaman Islands: "ad Portum Blair insularum Andamanicarum" [at Port Blair, Andaman Islands]
Remarks A single specimen of this slender variety was sent to Benson by Major Haughton. Benson (1863: 90) gave measurements of 30 mm length and 8 mm diameter, also noting that "There is tendency in the stouter form to verge towards the variety which I have called *oxynter*, although the extreme specimens might be considered as separate species". Pilsbry (1906) illustrated two specimens referable to this variety, which he noted had a dark olive "cuticle" and a columellar margin that was less sinuous than in *P. haughtoni*. None of the shells from the Benson collection retain original labels identifying them as *oxynter*, although the figured specimen is the most slender and approaches the dimensions given in the original description.

Prosopeas walkeri (Benson, 1863)

Spiraxis walkeri Benson, 1863a: 90; Pfeiffer, 1868 [in 1847–1877]: 189; Hanley and Theobald, 1873 [in 1870–1876]: 34, Pl. 79, Fig. 4
Stenogyra (*Opeas*) *walkeri* (Benson); Nevill, 1878: 165
Opeas walkeri (Benson); Godwin-Austen, 1895a: 443
Prosopeas walkeri (Benson); Pilsbry, 1906: 29, Pl. 6, Fig. 70; Gude, 1914a: 363; Ramakrishna et al., 2010: 183
Type material UMZC I.103115.A, **Fig. 56 E** (one of five syntypes from the R. McAndrew collection labelled "*Spiraxis Walkeri* Bens., Bens. col., Andeman I.")
Original measurements: "Long. 14, diam. 3½ mill."
Type locality Andaman Islands: "ad Portum Blair" [at Port Blair]

Remarks Benson (1863a: 90) based his description on several specimens: "None of the specimens sent by Major Haughton possess a perfect epidermis, and all are more or less injured at the aperture." Gude (1914a: 364) remarked that "Some specimens from Port Blair, presented by R. MacAndrew to the British Museum, are smaller than the type, for, although possessing nine whorls, they measure only 12 x 3 mm". These specimens could not be found in the NHM. *Prosopeas walkeri* is also known from Burma and Thailand (Ramakrishna et al., 2010).

Superfamily STREPTAXOIDEA

Family STREPTAXIDAE

Subfamily STREPTAXINAE

Genus *Carinartemis* Siriboon & Panha, 2014

***Carinartemis sankeyi* (Benson, 1859)**

Streptaxis sankeyi Benson, 1859d: 472; Pfeiffer, 1868 [in 1847–1877]: 442; Hanley and Theobald, 1874: 4, pl. 8, f. 7; Nevill, 1878: 3; Tryon, 1885: 72, pl. 14, figs 2, 3; Blanford and Godwin-Austen, 1908: 8, Fig. 7
Streptaxis sankeyanus Benson; Stoliczka, 1871: 167, Pl. 7, Fig. 14
Haploptychius sankeyi (Benson); Richardson, 1988: 220
Carinartemis sankeyi (Benson); Man et al., 2022: 84
Type material a neotype (UMZC I.102740.A, **Fig. 57 F**) is hereby designated from a series of six shells from the R. McAndrew collection labelled "*Streptaxis Sankeyi* Bens., Bens. col., Moulmein". We have designated a neotype with the express purpose of clarifying the taxonomic status of *H. sankeyi* (see below).
Original measurements: "Diam. major 10, minor 6¼, axis 7 mill."
Other material NHMUK 1954.6.2.566 (single shell from the J.S. Hawkins collection labelled "*Streptaxis sankeyi* Benson, Paratype, Moulmein, W.H. Benson 1859", accompanied by a small label in Benson's handwriting stating the number "13")
Type locality Burma: "Habitat prope Moulmein" [lives near Moulmein]. Benson also stated that Sankey's material was collected "in a singularly perforated limestone hill at Damathá, about twelve miles N.E. of Moulmein" (1859d: 472)
Remarks Benson based his original description on a single specimen provided by Richard Sankey. NHMUK 1954.6.2.566 was given to Hawkins by Benson and the labelling corresponds with a manuscript list of shells sent to Hawkins in April 1862 (MSS_ZOO_HAW). The identity of the holotype, which is presumably one of the seven known Benson collection specimens listed above, cannot be established with certainty and we therefore designate one of them as the neotype. Hanley and Theobald (1874 [in 1870–1876]) figured a specimen (Pl. 8, Fig. 7), described in a footnote as follows: "Our supposed variety has been separated by Stoliczka as *S. Hanleyana* (J. Asi. Beng. 1871, pl. 7, f. 15): he is quite right in regarding the form with a more tapering and rounded mouth as better suited to Benson's description (Pfeif. Mon. Hel. Vol. 5, p. 422 [sic]), although Benson's drawing (in our possession) represents the other. Had we possessed the typical *Sankeyi*, we should have preferentially figured it: it is verly like our pl. 98 f. 10 [*Streptaxis exacuta* Gould], only has not a smooth base or a second lamellar tubercle. Our figured specimen is quite large as the more characteristic form (J. Asi. Beng. 1871, vol 40, pt. 2, pl. 7 f. 14)."

Genus *Perrottetia* Kobelt, 1905

***Perrottetia theobaldi* (Benson, 1859)** [36]

Streptaxis theobaldi Benson, 1859e: 187; Pfeiffer, 1868 [in 1847–1877]: 449; Hanley and Theobald, 1870 [in 1870–1876]: 4, Pl. 8, Fig. 9; Nevill, 1878: 3; Tryon, 1885: 77, pl. 16, figs 86, 14; Blanford and Godwin-Austen, 1908: 9; Ramakrishna et al., 2010: 189
Perrottetia theobaldi (Benson); Richardson, 1988: 242; Gittenberger et al., 2021: 74, Fig. 1; Man et al., 2022: 59, Fig. 8
Type material UMZC I.102535, **Fig. 57 A** (syntype from the R. McAndrew collection labelled "*Streptaxis Theobaldi* Bens., Bens. col.", no locality data)
Original measurements: "Diam. major 6, minor 4⅓, axis 3 mill."
Other material NHMUK 1888.12.4.784, **Fig. 57 B** (one of three shells from the W. Theobald collection labelled "*Streptaxis theobaldi* Bens (typical), Khasi Hills"); EXEMS: 1720/1909/D1/81 (three shells from the J.E. Linter collection labelled "(*Eustreptaxis*) *S. Theobaldi* Ben., W.T." [William Theobald])
Type locality India: "Habitat ad Nauclai (lat. 25˚15', long. 92˚ 30'); detexit W. Theobald" [lives at Nauclai (lat. 25˚15', long. 92˚ 30'); discovered by W. Theobald]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. According to Ramakrishna et al. (2010), this species is widely distributed in India and has been identified from Arunachal Pradesh, Meghalaya, Manipur, Nagaland, as well as Burma. It has also recently been recorded from Bhutan (Gittenberger et al., 2021).

Genus *Indoartemon* Forcart, 1946

Indoartemon cingalensis (Benson, 1853)

Streptaxis cingalensis Benson, 1853c: 91; Pfeiffer, 1859 [in 1847–1877]: 333; Hanley and Theobald, 1874 [in 1870–1876]: 40, Pl. 98, Figs 2, 3; Nevill, 1878: 4; Tryon, 1885: 78, pl. 15, figs 50, 51; Blanford and Godwin-Austen, 1908: 12
Indoartemon cingalensis (Benson); Naggs and Raheem, 2000: Fig. 125
Type material a neotype (UMZC I.103945.A, **Fig. 57 E**) is hereby designated from a series of two shells from the R. McAndrew collection labelled "*Streptaxis Cingalensis* Benson, Ceylon"). We have designated a neotype with the express purpose of clarifying the taxonomic status of *S. cingalensis* (see below).
Original measurements: "Diam. major 11, minor 8, alt. 5 mill."
Type locality Sri Lanka: "Hab. in pago Hewagam Corle Insulae Ceylon, inter rimas saxorum" [lives in the district of Hewagam Corle, Island of Ceylon, between the cracks of rocks]
Remarks The number of specimens collected by Edgar Layard was not noted in the original description. Blanford and Godwin-Austen (1908: 13) gave the following measurements "Length of type 11, breadth 8 1/3, height 5 2/3 mm", which match the dimensions of one of the UMZC specimens; the second specimen belongs to another streptaxid species. However, McAndrew's label does not state that the Cambridge shells are from the Benson collection, although this is likely. Nevill (1878: 4) listed a lot of two shells labelled "Ceylon; ex c. F.L. Layard" [an error for E.L. Layard] in the Indian Museum. The distribution of *I. cingalensis* was shown by Siriboon et al. (2014: Fig. 1).

Indoartemon layardianus (Benson, 1853)

Streptaxis layardiana Benson, 1853c: 90; Pfeiffer, 1859 [in 1847–1877]: 332; Pfeiffer, 1876 [in 1847–1877]: 495; Hanley and Theobald, 1874 [in 1870–1876]: 39, Pl. 98, Figs 1, 4
Streptaxis layardianus Benson; Nevill, 1878: 4; Tryon, 1885: 75, pl. 15, figs 22, 23; Blanford and Godwin-Austen, 1908: 5
Indoartemon layardianus (Benson); Naggs and Raheem, 2000: Fig. 127
Type material not located
Original measurements: "Diam. major 10½, minor 8, alt. 4 mill."
Other material UMZC I.104975.A (four shells, all adult specimens together with a tiny shell fragment, from the R. McAndrew collection labelled "*Streptaxis Layardiana* Pfr., Ceylon"); UMZC I.104976, **Fig. 57 C** (single adult shell, label as for UMZC I.104975); UMZC I.104977, **Fig. 57 D** (single juvenile shell label as for UMZC I.104975)
Type locality Sri Lanka: "Hab. inter lapides ad verticem rupis Mehintali Insulae Ceylon" [lives among the stones at the summit of Mehintali Rock on the Island of Ceylon]
Remarks Benson based his description on at least two shells collected by Edgar Layard: "In one or two specimens the callus near the upper margin is inclined to form an obtuse tooth at the side of the sinus ..." The UMZC material is not labelled as coming from the Benson collection, although this is the likely source. The dimensions of UMZC I.104976 broadly correspond with the measurements given by Benson (1853c). Nevill (1878: 4) listed a single shell labelled "Ceylon; ex c. F.L. Layard" in the Indian Museum. There is a lot in London (NHMUK 20190440) labelled "*S. Layardianus*, Benson, Ceylon., Mr Layard" acquired from Layard by Hugh Cuming, but these belong to a different species. The distribution of *I. layardianus* was shown by Siriboon et al. (2014: Fig. 1).

Subfamily ENNEINAE

Genus *Gulella* L. Pfeiffer, 1856

Gulella ofella (Benson, 1864) comb. nov.

Pupa ofella Benson, 1864a: 139
Type material UMZC I.104665, **Fig. 56 G** (holotype from the R. McAndrew collection labelled "*Pupa Ofella* Bens., Bens. col., Liberia")
Original measurements: "Long. 1½, diam. 1 mill."
Type locality Liberia, Africa: "Habitat prope Liberiam Africae occidentalis" [lives near Liberia, west Africa]
Remarks Benson (1864a: 139) based his description on a single specimen: "This minute shell (long mislaid) has been several years in my possession: it fell out of the interior of one of several shells from Liberia, and appears to have been overlooked by collectors ... The shell is in excellent condition, and its animal had probably crept with it into the aperture of the deserted shell of another species." He went on to note that "There is a bright red appearance internally, which leads to the belief that a portion of the animal is scarlet …" Although Benson's admission that this unique specimen had been 'long mislaid' adds a degree of ambiguity to the status of UMZC I.104665, it appears that the original specimen eventually re-surfaced. This specimen is a juvenile with well-developed apertural barriers and fine regular ribs on the apical whorls. It is clearly a species of *Gulella* (*sensu lato*), similar to *Gulella stolidodea* Degner, 1934 from West Africa, although slightly larger; the two taxa are certainly

distinct but appear to be closely related (Ton de Winter, *pers. comm*.).

Subfamily ORTHOGIBBINAE

Genus *Haploptychius* Möllendorff, 1905

Haploptychius andamanicus (Benson, 1860)

Streptaxis andamanica Benson, 1860c: 192; Pfeiffer, 1868 [in 1847–1877]: 444; Hanley and Theobald, 1870 [in 1870–1876]: 4, Pl. 8, Fig. 6
Streptaxis andamanicus Benson; Nevill, 1878: 2; Tryon, 1885: Pl. 14, Fig. 1, 15; Blanford and Godwin-Austen, 1908: 5
Haploptychius andamanicus (Benson); Ramakrishna et al., 2010: 189; Rao et al., 2013: 133
Type material NHMUK 1888.12.4.787, **Fig. 58 A** (holotype from the W. Theobald collection labelled "*Streptaxis andamanicus* Benson, Andamans")
Original measurements: "Long. 7, diam 4½ mill."
Other material UMZC I.103160.A, **Fig. 58 B** (one of five shells from the R. McAndrew collection labelled "*Streptaxis Andamanicus* Benson, Bens. col., Andeman Ids")
Type locality Andaman Islands: "Habitat in Insulis Andamanicis" [lives on the Andaman Islands]
Remarks Benson (1860c: 192) based his description on a single shell provided by William Theobald. We assume that Benson returned the holotype to Theobald, as he appears to have done for other species founded on single specimens (cf. Theobald, 1876a: 50) and therefore accept NHMUK 1888.12.4.787 as the holotype. This species is endemic to the Andaman Islands (Rao et al., 2013).

Haploptychius bombax (Benson, 1859)

Helix bombax Benson, 1859e: 186; Pfeiffer, 1868 [in 1847–1877]: 151; Hanley and Theobald, 1870 [in 1870–1876]:15, Pl. 31, Figs 1, 4 (immature shell)
Streptaxis bombax (Benson); Stoliczka, 1871: 167; Theobald, 1876: 187, Pl. 14, Fig. 6; Hanley and Theobald, 1876 [in 1870–1876]: 63, Pl. 156, Fig. 9; Nevill, 1878: 3; Blanford and Godwin-Austen, 1908: 4
Haploptychius bombax (Benson); Richardson, 1988: 212; Man et al., 2022: 62, Fig. 9
Type material UMZC I.102470.A, **Fig. 58 C** (holotype from the R. McAndrew collection labelled "*Nanina Bombax* Bens., Bens. col., Moulmein")
Original measurements: "Diam. major 8, minor 6, axis 4 mill."
Other material UMZC I.102470.B–C (two smaller shells from the holotype lot); NHMUK 1888.12.4.768–770 (three shells from the W. Theobald collection labelled "*Streptaxis bombax* Benson, Moulmein"); EXEMS: 1720/1909/D1/66a (single shell from the J.E. Linter collection labelled "(*Eustreptaxis*) *S. bombax* Ben., India (n. s)" and "*S. bombax* Ben."); EXEMS: 1720/1909/D1/77 (single shell from the J.E. Linter collection labelled "*S. bombax* var. Ben., W. T." [William Theobald])
Type locality Burma: "Habitat ad Moulmein, necnon ad Phie Than in provincia Tenasserim, satis frequens" [lives at Moulmein, and at Phie Than in Tenasserim province, quite common]
Remarks Benson based his original description on a single shell collected by William Theobald: "The single specimen sent is bleached, and without epidermis". All of the specimens from the Benson collection in the UMZC lack periostracum, but only the largest approaches the dimensions given by Benson and we accept this specimen as the holotype. Theobald (1857: 249) had previously included Benson's manuscript name in his list of known Burmese taxa without providing a description, noting that the species was "rather rare". Nevill (1878: 3) mentioned a lot of eight specimens labelled "Moulmein; coll. W. Theobald Esq." in the Indian Museum.

Family DIAPHERIDAE [36]

Genus *Pupennea* Páll-Gergely, 2020

Pupennea planguncula (Benson, 1863)

Pupa planguncula Benson, 1863c: 426; Pfeiffer, 1868 [in 1847–1877]: 329; Reeve and Sowerby, 1876 [in 1875–1878], 20 (*Pupa*): pl. 7, species 57; Hanley and Theobald, 1874: 41, Pl. 101, Fig. 2
Ennea (*Huttonella*) *planguncula* (Benson); Nevill, 1878: 7; Blanford and Godwin-Austen, 1908: 23, Fig. 14
Sinoennea planguncula (Benson); Ramakrishna et al., 2010: 195; Raheem et al., 2014: 145, Fig. 95A–B
Pupennea planguncula (Benson); Páll-Gergely et al., 2020b: 700, figs 13, 22D
Type material UMZC I.103310.B, **Fig. 58 E** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 145, Fig. 95A) from the R. McAndrew collection labelled "*P. Plangunculus* Bens., Bens. col., Nerbudda"); UMZC I.103310.A, **Fig. 58 F** (one of two paralectotypes from the same lot)
Original measurements: "Long. 3, diam. 1⅓ mill."
Other material NHMUK 1888.12.4.495 (single shell from the W. Theobald collection labelled "*Pupa planguncula* Benson (Fig. in C.I./ typical), Narbada Valley"); EXEMS: 1720/1909/D35/84 (single shell from the J.E. Linter collection labelled "*P. planguncula* Ben., Narbada Valley, India, W.T." [William Theobald])
Type locality India: "in regione Orissae et prope fluvium Nerbuddae. Detexit W. Theobald" [in the

Orissa region and near the Nurbudda River. Discovered by W. Theobald]

Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. Nevill (1878: 7) listed a specimen in the Indian Museum labelled "Cuttack, in Orissa; donor W. Theobald Esq.; ex c. As. Soc. Beng. A fine, adult, typical specimen". This is the type species of *Pupennea* Páll-Gergely, 2020 and is endemic to India and Sri Lanka (Raheem et al., 2014).

Genus *Sinoennea* Kobelt, 1904b [36]

Sinoennea stenopylis (Benson, 1860)

Ennea stenopylis Benson, 1860h: 460; Pfeiffer, 1868 [in 1847–1877]: 455; Godwin-Austen, 1872, Pl. 30, Fig. 5; Nevill, 1878: 7; Tryon, 1885: 92, Pl. 18, Fig. 65; Blanford and Godwin-Austen, 1908: 17; Ramakrishna et al., 2010: 191

Pupa stenopylis (Benson); Hanley and Theobald, 1874 [in 1870–1876]: 41, Pl. 101, Fig. 1; Reeve and Sowerby, 1876 [in 1875–1878], 20 (*Pupa*): pl. 14, species 125

Indoennea stenopylis (Benson); Peile, 1929a: 154, Fig. 7

Sinoennea stenopylis (Benson); Peile, 1935: 383, Fig. 3; Richardson, 1988: 161; Budha et al., 2015: 18; Páll-Gergely et al., 2020b: 709

Type material UMZC I.103135, **Fig. 58 D** (syntype from the R. McAndrew collection labelled "*P. stenopylis* Bens., Bens. col., Darjiling")

Original measurements: "Long. 3½, diam. 1½ mill."

Other material NHMUK 1860.6.27.22 (single shell presented by W.T. Blanford labelled "No. 35, *Ennea stenopylis* Benson, Darjiling, W.T. Blanford Esq."); 1906.2.2.185 (two shells from the W.T. Blanford collection labelled "*Ennea stenopylis* Bs., Darjiling")

Type locality India: "Habitat in vallibus Rungnu et Rimmau (alt. 4000 ped.) prope Darjiling. Detexit W.T. Blanford" [lives in the Rungun and Rimmau valleys (altitude 4000 feet) near Darjiling. Discovered by W.T. Blanford]

Remarks The number of specimens provided by William Blanford was not noted in Benson's original description. This species has been identified from various places in India (Arunachal Pradesh, Manipur, Meghalaya, Nagaland and above 4000 feet in Sikkim) and in Nepal (Budha et al., 2015).

Sinoennea vara (Benson, 1859)

Pupa (*Ennea*) *vara* Benson, 1859e: 188; Pfeiffer, 1868 [in 1847–1877]: 455; Reeve and Sowerby, 1876 [in 1875–1878], 20 (*Pupa*): pl. 16, species 144; Hanley and Theobald, 1874 [in 1870–1876]: 40, Pl. 100, Fig. 3

Ennea vara (Benson); Nevill, 1878: 7; Tryon, 1885: 106, Pl. 18, Fig. 57; Godwin-Austen, 1872: Pl. 30, Fig. 6; Blanford and Godwin-Austen, 1908: 16, Fig. 10; Ramakrishna et al., 2010: 191

Indoennea vara (Benson); Peile, 1929a: 154, Fig. 3; 1929b: 270, Fig. 1

Sinoennea vara (Benson); Richardson, 1988: 162; Páll-Gergely et al., 2020b: 710

Material a neotype (NHMUK 1888.12.4.604, **Fig. 56 F**) is hereby designated from a series of three shells from the W. Theobald collection labelled "*Indoennea vara* Benson, Khasi Hills"). We have designated a neotype with the express purpose of clarifying the taxonomic status of *S. vara* (see below).

Original measurements: "Long. 5, diam. 1½ mill." (Benson, 1859e: 188)

Type locality India: "Khasi Hills"

Original locality India: "Habitat cum praecedente, raro occurrens." [lives with the preceding species (*Streptaxis theobaldi*), occurs rarely, i.e. "at Nauclai (lat. 25˚ 15', long. 92˚ 30'); discovered by W. Theobald"]

Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. The type series could not be traced. Nauclai is in the Khasi Hills, so the locality appended to NHMUK 1888.12.4.604–606 is compatible with the type locality. This species has recently been recorded from Bhutan (Gittenberger et al., 2021).

Suborder HELICINA

["NON-ACHATINOID CLADE"]

Superfamily PLECTOPYLOIDEA [37]

Family PLECTOPYLIDAE

Subfamily PLECTOPYLINAE [37]

Genus *Plectopylis* Benson, 1860

Plectopylis cyclaspis (Benson, 1859)

Helix catinus Benson, 1859e: 185 (non *H. catinus* L. Pfeiffer, 1857a)

Helix cyclaspis Benson, 1859h: 273; Hanley and Theobald, 1870 [in 1870–1876]: 7, Pl. 13, Fig. 10

Helix (*Plectopylis*) *cyclaspis* Benson; Benson, 1860i: 245; Godwin-Austen, 1875a: Pl. 74, Fig. 10; Nevill, 1878: 72

Helix (*Atopa* (*Plectopylis*)) *cyclaspis* Benson; Tryon, 1887: 164, pl. 35, Fig. 9

Plectopylis cyclaspis (Benson); Stoliczka, 1871: 222, pl. 15, figs 4–6; Pilsbry, 1894: 144: pl. 42, figs 34–36; Gude, 1897a: 244, Fig. 34

Plectopylis (*Plectopylis*) *cyclaspis* (Benson); Gude, 1899d: 148; Gude, 1914a: 130, Fig. 65

Type material a neotype (UMZC I.102700.A, **Fig. 59 A**) is hereby designated from a series of six shells from the R. McAndrew collection labelled "*Anchistoma* (*Corilla*) *Cyclaspis* Bens., Bens. col., Moulmein". We have designated a neotype with the express purpose of clarifying the taxonomic status of *P. cyclaspis* (see below).
Original measurements: "Diam. major 18, minor 16, axis 6½ mill."
Other material NHMUK 1954.6.2.270–271 (two shells from the J.S. Hawkins collection labelled "*Plectopylis cyclaspis* Benson, ?Paratypes, Moulmein, Burma", accompanied by a label in Robert Gordon's handwriting that reads "1. *Helix cyclaspis* Benson. For description see Extract from the Annals & Magazine of Natural History for April 1860 - I think you know the small pamphlets containing M^{r} Benson's *fertis* [work]")
Type locality Burma: "Habitat prope Moulmein, provinciae Tenasserim, rarissime" [lives near Moulmein, Tenasserim province, very rare]
Remarks Theobald (1857: 249) listed Benson's manuscript name *Helix catinus* without providing a description. Benson (1859e: 185) eventually published a description based on a single shell provided by Theobald that was "in such a corroded state, that the true nature of the sculpture can merely be guessed at". He subsequently published an extended diagnosis (Benson, 1860i: 245) that included details of the sculpture and colour based on better specimens provided by Capt. J.C. Haughton at the Farm Caves near Moulmein (see also Gude, 1897a: 244). Benson (1859h: 273) proposed the replacement name *Helix cyclaspis* (now *Plectopylis cyclaspis*) to avoid homonymy with *Helix catinus* L. Pfeiffer, 1857. The specimens in the J.S. Hawkins collection were given to him by Col. Robert Gordon and correspond to a manuscript list (letter from Gordon to Hawkins, MSS_ZOO_HAW); they are therefore not paratypes as labelled. In keeping with Benson's practice of returning unique specimens to Theobald, the worn holotype might be expected to be in latter's collection but does not appear to have survived. We therefore designate one of the Benson collection specimens as the neotype.

Genus *Chersaecia* Gude, 1899

Chersaecia brachyplecta (Benson, 1863)

Helix (*Plectopylis*) *brachyplecta* Benson, 1863b: 319; Godwin-Austen, 1875a: Pl. 74, Fig. 8;
Nevill, 1878: 72
Helix brachyplecta Benson; Hanley and Theobald, 1872 [in 1870–1876]: 26, Pl. 57, Figs 7, 10
Plectopylis brachyplecta (Benson); Pilsbry, 1894: 145; Gude, 1897a: 246, Fig. 37d–f
Plectopylis (*Endoplon*) *brachyplecta* (Benson); Gude, 1899d: 148; Gude, 1914a: 117, Fig. 57
Endoplon brachyplecta (Benson); Schileyko, 1999: 460
Chersaecia brachyplecta (Benson); Páll-Gergely, 2018: 17, figs 6C–D, 7I–J
Type material UMZC I.103145 (two syntypes from the R. McAndrew collection labelled "*Plectopylis Brachyplecta* Bens., Bens. col., Moulmein", one of which (UMZC I.103145.A, **Fig. 59 C**) is here designated as the lectotype; a second label in unknown handwriting (**Fig. 59 E**) reads "TYPE-SPECIMENS. The dissected one is figured by Mr G.K. Gude in "Science Gossip", III, p. 246. *Plectopylis brachyplecta*, Benson., Benson Coll., Moulmain". The second shell is also illustrated as **Fig. 59 D**)
Original measurements: Diam. major 22, minor 18, axis 8 mill."
Other material NHMUK 1954.6.2.282, **Fig. 59 B** (invalid lectotype designated by Páll-Gergely and Hunyadi (2013: Fig. 12) from the J.S. Hawkins collection labelled "*Helix brachyplecta* Benson, Paratype, Moulmein". A separate label in Robert Gordon's hand reads "not yet described a new shell so named by Mr Benson")
Type locality Burma: "ad ripas fluvii Attaran prope Moulmein. Teste Col. R. Gordon" [on the banks of the Attaran River near Moulmein, according to Col. R. Gordon]
Remarks The number of specimens provided by Col. Robert Gordon was not noted in Benson's original description. The internal armature of a dissected shell from the series of syntypes from Moulmein was figured by Gude (1897a: 246, Fig. 37d–f; 1914a: 118, Fig. 57). NHMUK 1954.6.2.282 is from a collection of shells from Moulmein given to J.S. Hawkins by Robert Gordon in 1863 (ZOO_MSS_HAW) and is therefore not considered part of the type series. This specimen was designated as the lectotype by Páll-Gergely and Hunyadi (2013), but since it is not a syntype this designation is invalid. Gude selected *Helix brachyplecta* as the type species of *Endoplon* Gude, 1899, but Páll-Gergely (2018) included *Endoplon* in the synonymy of *Chersaecia* Gude, 1899, recently elevated to generic rank (Páll-Gergely and Hunyadi, 2013; Páll-Gergely, 2018).

Chersaecia dextrorsa (Benson, 1860)

Helix (*Plectopylis*) *refuga var. dextrorsa* Benson, 1860i: 246; Hanley and Theobald, 1870 [in 1870–1876]: 7, Pl. 13, Fig. 9
Helix (*Atopa* (*Plectopylis*)) *refuga*, var. *dextrorsa* Benson; Tryon, 1887: 164, Pl. 35, Fig. 2

Helix (*Plectopylis*) *dextrorsa* (Benson); Godwin-Austen, 1875b: 44; Nevill, 1878: 70
Plectopylis dextrorsa (Benson); Pilsbry, 1894: 145; Gude, 1896b: 156, Fig. 21
Plectopylis (*Chersaecia*) *dextrorsa* (Benson); Gude, 1899d: 148; Gude, 1914a: 110, Fig. 52
Chersaecia dextrorsa (Benson, 1860); Páll-Gergely, 2018: 20, figs 7E–H, 9–10, 11A–B
Type material UMZC I.104955.A, **Fig. 59 E** (one of three syntypes from the R. McAndrew collection, associated with three different labels: one in McAndrew's handwriting reads "*Plectopylis Refuga* var *Dextrorsa* Gould, Bens. col., Tenasserim"; another in unknown handwriting reads "*Plectopylis dextrorsa* not *refuga*" and a third, possibly written by E.R. Sykes, reads "*Plectopylis dextrorsa* (not a var of *P. refuga*) fide G.K. Gude see Science Gossip III p. 156., Tenasserim, Benson coll.")
Original measurements: none given
Other material NHMUK 1906.2.2.144 (single shell from the W.T. Blanford collection labelled "*Plectopylis refuga* G^{d}–var. *dextrorsa* G.A., T [type], Tenasserim Valley, spec. fig^{d} Conch. Ind. Pl. XII f-9")
Type locality Burma: "Phye-thán, in the Tenasserim Valley"
Remarks The number of specimens examined was not noted in Benson's original description, nor was it clearly stated from whom they were obtained. Theobald (1857: 250) listed the name *Helix refuga* var. *dextrorsa* without description but did not attribute the name to Benson or indicate that it was one of the specimens he had supplied to him. Benson originally considered this species to be a form of *Plectopylis refuga* (Gould, 1846), but it was later regarded by Godwin-Austen (1875b) as a distinct species that was close to *P. leiophis*. Gude (1914a: 110), however, considered that its nearest ally was *P. brachydiscus*, but listed a number of important differences. Hanley and Theobald (1870 [in 1870–1876]: 7) confusingly attributed the subspecies to Philippi (1851), but this publication made no reference to a dextral form and described only Gould's *P. refuga*. A footnote to Hanley and Theobald's entry (1876 [in 1870–1876]: ix) also noted "our supposed dextral var. has been lately named *dextrorsa*", this wording suggesting a publication more recent than Benson (1860i) that we have not been able to identify. The NHM shell from the Blanford collection is labelled as the specimen figured by Hanley and Theobald, but there is no evidence linking it directly with Benson and we do not consider it part of the type series. This is a rare case in which Benson did not state explicitly the source of his material from Burma, although Theobald and Blanford are likely candidates. Godwin-Austen, who compiled the register of Blanford's collection, appended the letter 'T' to the entry for this specimen to signify type status, but his reasons for doing so are not recorded. Presumably on this basis, Páll-Gergely (2018: 20) regarded NHMUK 1906.2.2.144 as the "holotype" of *Chersaecia dextrorsa* (Benson, 1860), clearly unaware of the existence of genuine Benson material in the UMZC.

Chersaecia leiophis (Benson, 1860)

Helix leiophis Benson, 1860i: 246
Helix (*Plectopylis*) *leiophis* Benson; Blanford, 1863b: 86; Blanford, 1865: 94
Helix (*Atopa* (*Plectopylis*)) *leiophis* Benson; Tryon, 1884: 33, pl. 33, Pl. 94, Fig. 25
Plectopylis leiophis (Benson); Pilsbry, 1894: 145; Gude, 1898d: 16, Fig. 76
Plectopylis (*Chersaecia*) *leiophis* (Benson); Gude, 1899d: 148; Gude, 1914a: 99, figs 44, 45
Chersaecia leiophis (Benson); Schileyko, 1999: 462
Type material UMZC I.103265.A, **Fig. 59 F** (one of four syntypes from the McAndrew collection labelled "*Plectopylus Leiopis* [corrected in pencil to "*-phis*"] Bens., Bens. col., Thyet Myo, Pegu")
Original measurements: "Diam. major 11–14, minor 8–11, alt. 3–4½ mill."
Type locality Burma: "ad Kwadouk, prope Thyet Mio" [at Kwadouk, near Thyet Mio]
Remarks The number of specimens was not noted in Benson's original description, although there must have been at least two as he provided size ranges. He also did not clearly state from whom the shells were obtained. Gude (1914a: 99) mentioned that the "type specimens" are in the UMZC and that *P. refuga* Gould is conspecific with *P. leiophis* (see also Godwin-Austen, 1875b: 44). Gude (1899d) selected this species as the type species of *Chersaecia* Gude, 1899 but his concept of this genus requires comprehensive revision (Páll-Gergely and Hunyadi, 2013: 7; Páll-Gergely, 2018). In the UMZC there is a tablet with three shells (UMZC I.104415) labelled "*Nanina lacythis* [sic], type, Benson Coll." but subsequently altered in pencil to "*P. leiophis* (?)". Gude initially referred these specimens to immature forms of *Plectopylis achatina* L. Pfeiffer, 1845, one of which he illustrated (Gude, 1898e: 115, Fig. 82a–c). Because this name was preoccupied (*Helix achatina* Gmelin, 1791 and *Helix achatina* Potiez & Michaud, 1838), Gude (1914a: 138) subsequently proposed the replacement name *Plectopylis bensoni* and referred the immature UMZC shells to this species (Gude, 1914a: 141: Fig. 72).

Subfamily SINICOLINAE [38]

Genus *Endothyrella* Zilch, 1960

***Endothyrella pinacis* (Benson, 1859)**

Helix pinacis Benson, 1859h: 268; Hanley and Theobald, 1870 [in 1870–1876], 7, Pl. 13, Fig. 5; 1874, pl. 84, figs 1, 4
Helix (*Plectopylis*) *pinacis* Benson; Benson, 1860i: 247; Blanford, 1863b: 86; Nevill, 1878: 71
Helix (*Atopa* (*Plectopylis*)) *pinacis* Benson; Tryon, 1887: 159, pl. 34, figs 53–55
Plectopylis pinacis (Benson); Pilsbry, 1894: 146; Gude, 1897a: 206, Fig. 32; Godwin-Austen, 1907 [in 1897–1914]: 203, pl. 114, Fig. 2 (anatomy)
Plectopylis (*Endothyra*) *pinacis* (Benson); Gude, 1899d; Gude, 1914a: 86, Fig. 35
Plectopylis (*Endothyrella*) *pinacis* (Benson); Ramakrishna et al., 2010: 201
Endothyrella pinacis (Benson); Schileyko, 1999: 461; Páll-Gergely et al., 2015b: 50, figs 24D–F
Type material UMZC I.102755, **Fig. 60 A** (syntype from the R. McAndrew collection labelled "*Discus Pinacis* Bens., Bens. col., Sikkim")
Original measurements: "Diam. major 14, minor 12½, axis 4½ mill."
Other material NHMUK 1860.6.27.14 (single shell presented by W.T. Blanford labelled "*Helix pinacis* Bens., Darjiling); NHMUK 1906.2.2.143 (eight shells from the W.T. Blanford collection labelled "*Plectopylis pinacis* Bs., Khasi Hills, Sikkim")
Type locality India: "Habitat raro in regione Sikkim in valle Rungun (4000 ped.), necnon prope Pankabari (1000 ped. alt.)" [lives rarely in the Sikkim region in the Rungun Valley (4000 feet), and also near Pankabari (altitude of 1000 feet)]
Remarks The number of specimens was not noted in Benson's original description and it is unclear if William or Henry Blanford provided the material. The anatomy of this species was described by Godwin-Austen (1907 [in 1889–1914]: 203–204) and Schileyko (1999) and differential diagnoses with other species of *Endothyrella* are provided by Páll-Gergely et al. (2015b).

***Endothyrella plectostoma* (Benson, 1836)**

Helix plectostoma Benson, 1836a: 351; Reeve, 1852 [in 1851–1854], 7 (*Helix*): pl. 129, species 782; Hanley and Theobald, 1870 [in 1870–1876]: 7, Pl. 13, Fig. 2
Helix (*Plectopylis*) *plectostoma* Benson; Blanford, 1863b: 86; Godwin-Austen, 1875a: 612, pl. 73, Fig. 2 (armature); Nevill, 1878: 71
Helix (*Atopa* (*Plectopylis*)) *plectostoma* Benson; Tryon, 1887: 160, pl. 34, figs 69, 70
Plectopylis plectostoma (Benson); Gude, 1897b: 274, Fig. 39
Plectopylis (*Endothyra*) *plectostoma* (Benson); Gude, 1899d: 148; Gude, 1914a: 81, Fig. 31
Plectopylis (*Endothyrella*) *plectostoma* (Benson); Ramakrishna et al., 2010: 202
Endothyrella plectostoma (Benson); Schileyko, 1999: 460; Páll-Gergely et al., 2015b: figs 8A–B, 13A–B, 19A, 19D–F, 20E–F, 23, 24D–E
Type material UMZC I.102155, **Fig. 60 B** (syntype from the R. McAndrew collection labelled "*Plectopylis plectostoma* Benson, Benson coll., Darjeeling, CO-TYPE. Figured by Mr G.K. Gude in "Science Gossip", III, p.274 (see also p. 275)", with another label (**Fig. 60 D**) that reads "This shell has been figured in Science Gossip (shortly to be issued) & is the true *plectostoma* from Darjeeling"); UMZC I.102160 (seven syntypes from the R. McAndrew collection labelled "*Plectopylis Plectostoma* Bens., Bens. col., Darjeeling", with another label that reads "All these are the true *plectostoma*, 7 specimens, the eighth is in a separate paper and has been figured"); UMZC I.102165 (three syntypes from the R. McAndrew collection labelled "*Plectopylis Plectostoma* Bens., Bens. col., Bengal")
Original measurements: "Diam. 0.35 poll. paulo plus" [a little more]
Other material UMZC I.102170 (two shells from the R. McAndrew collection labelled "*P. plectostoma* var. *tricarinata* var. nob. Gude (type), Bens. coll., Bengal"); NHMUK 1954.6.2.287 (single shell from the J.S. Hawkins collection labelled "*Helix plectostoma* Benson, ?Paratype, Bassein, Burma, W.H. Benson 1863"); MCZH 142862 (six shells labelled "*Helix plectostoma* Bens, India, McAndrew Benson, Paratypes")
Type locality Bangladesh: part of a collection "chiefly made in the hills on the N.E. Frontier of Bengal"
Remarks The number of specimens examined was not noted in Benson's original description, which was based on material in the Museum of the Asiatic Society acquired from an expedition to "Sylhet, Cherra Poonji and the Khasi Hills" (Pearson, 1833). Nevill (1878: 71) listed five shells from "Sylhet (types); ex c. As. Soc., Bengal" [i.e. syntypes] in the Indian Museum. Gude (1914a: 81–82) noted that two different forms, one with and one without a horizontal fold given off from the parietal vertical plate, have been included under *plectostoma*. He examined what he thought were syntypes in the UMZC from "Darjeerling", which all had the horizontal fold, a character therefore typifying true *plectostoma*. NHMUK 1954.6.2.287 is from Burma and therefore cannot have formed part of the type series, despite originating from the Benson collection. This species has a wide distribution in

north-eastern India and it also occurs in Bago and the Arakan Hills in Burma. It is the type species of *Endothyrella* Zilch, 1960 (a replacement name for *Endothyra* Gude, 1899 non Phillips, 1845), a genus recently reviewed by Páll-Gergely et al. (2015b). Gude (1897a: 275, Fig. 40) described a form of *plectostoma* collected by Benson as var *tricarinata*, represented in the UMZC by two specimens (UMZC I.102170), labelled as the "Type specimens". Gude noted that *tricarinata* differed from the type in being "larger and more conical, in having the periphery acutely keeled, and in having three raised ridges between the periphery and the suture, revolving as far as the fourth whorl" (Gude, 1914a: 83). Páll-Gergely et al. (2015b) have recently elevated this to species rank as *Endothyrella tricarinata* (Gude, 1897).

Superfamily PUNCTOIDEA

Family CHAROPIDAE

Subfamily CHAROPINAE [39]

Genus *Trachycystis* Pilsbry, 1893 [40]

Trachycystis bisculpta (Benson, 1851)

Helix bisculpta Benson, 1851b: 103; Pfeiffer, 1853 [in 1853–1854], i(12_3), 380: pl. 141, figs 17–19; Reeve, 1853 [in 1851–1854], 7 (*Helix*): pl. 173, species 1171
Phasis (*Trachycystis*) *bisculpta* (Benson); Pilsbry, 1893: 37–38, pl. 10, figs 5–7, pl. 15, figs 3–4
Trachycystis (*Trachycystis*) *bisculpta* (Benson); Watson, 1934: 165, 177, Fig. 2A, Pl. xx, Figs 11–12; Connolly, 1939: 189
Type material UMZC I.104165, **Fig. 60 C** (one of seven syntypes from the R. McAndrew collection labelled "*Hemiplecta Bisculpta* Bens., Bens. col.", no locality data)
Original measurements: "Diam. major 7, minor 6, axis 4½ mill."
Other material NHMUK 1912.8.16.204–205 (two shells from the collection of E.L. Layard labelled "*H. bisculpta* B., Benson types, S. Africa"); NHMUK 1954.6.2.159–160 (two shells from the J.S. Hawkins collection labelled "*Helix bisculpta* Benson, Lions Head, Table Mts, S. Africa")
Type locality South Africa: "Hab. sub lapidibus ad Camp's Bay, P.B.S." [lives under stones at Camp's Bay, Cape of Good Hope]
Remarks Benson's original description was based on seven specimens: "*Helix bisculpta* inhabits the declivity of the rocky terrace which intervenes between the western face of Table Mountain and the Southern Atlantic Ocean. Seven specimens occurred, in April and May 1846, at the same spot where I had the good fortune to capture a specimen of *Paussus Burmeisteri* [a species of beetle], harbouring under loose stones." Connolly (1939: 189) noted that the "originals" were in the UMZC. *Trachycystis bisculpta* is widely distributed in the Cape Province. Connolly (1939: 189) noted that the shells of this species from the more easterly districts were of darker, more rufous hue than the majority of those from the Cape Peninsula and Caledon, whereas the form from Bredasdorp were particularly large. Martens (1860: 84) designated *Helix bisculpta* as the type of *Pella* E. von Martens, 1860, a junior homonym of *Pella* Stephens, 1835 (Coleoptera). Pilsbry (1893: 136) subsequently designated *H. bisculpta* as the type of *Trachycystis* Pilsbry, 1893 by typification of replaced name.

Trachycystis tollini (Benson, 1856)

Helix tollini Albers in Benson, 1856c: 436; Albers, 1857, 4: 94
Trachycystis (*Trachycystis*) *tollini* (Albers); Watson, 1934: 163–169, Pl. xx, Fig. 13; Connolly, 1912: 147; 1939: 189
Type material UMZC I.102885.A, **Fig. 60 E** (one of two syntypes from the R. McAndrew collection labelled "*Nanina Afra* Pfr?, Bens. col., Cape")
Original measurements: "Diam. major 12–14, minor 11–12½, axis 7–9 mill."
Other material UMZC I.102880 (eight shells from the R. McAndrew collection labelled "Cape G.H." [Cape of Good Hope]); NHMUK 1954.6.2.131–133 (three shells from the J.S. Hawkins collection labelled "*Helix tollini* Albers, Simons Town, S. Africa, G.H. Browning 1859")
Type locality South Africa: "Mr. Layard has found it on all sides of Table Mountain at the Cape of Good Hope, on the Devil's Peak, and in the ravine behind the Admiralty at Simonstown, always in damp shady places, under stones"
Remarks Benson (1856c: 437) explained: "Previously to the receipt of Mr. Layard's specimens, Dr. Pfeiffer, who had obtained the shell from Dr. Albers, sent it to me for inspection; and I subsequently received examples from Dr. Albers himself, with the name above adopted, Mr. Tollin having transmitted to him the first specimens seen in Europe." In the original description of this species, Benson (1856c) used the manuscript name proposed by Albers and attributes authorship to him. However, it was Benson who provided the description and therefore he is the authority for *tollini*. *Nanina afra* Pfeiffer, 1855, which appears on the label of the UMZC syntypes, is a nomen nudum.

Trachycystis sabuletorum (Benson, 1851) [41]

Helix sabuletorum Benson, 1851b: 105; Pfeiffer, 1853 [in 1853–1854], 1(12$_3$), 414: pl. 147, figs 16–17; Reeve, 1853 [1851–1854], 7 (*Helix*): pl. 174, species 1180
Trachycystis sabuletorum (Benson); Connolly, 1912: 146; 1939: 203
Type material UMZC I.103760.A, **Fig. 60 F** (one of nine syntypes from the R. McAndrew collection labelled "*Discus Sabuletorum* Bens., Bens. col., Cape G.H." [Cape of Good Hope]); UMZC I.103755 (two syntypes from the R. McAndrew collection labelled "*Discus Sabuletorum* Var. Bens., Bens. col., So. Africa" [South Africa])
Original measurements: "Diam. major 4½, minor 4, axis 2 mill."
Type locality South Africa: "Hab. ad Hout Bay; Strand non procul ab vico Somerset; et ad Kalk Bay, P. B. S., in arenosis, prope littore maris" [lives at Hout Bay; "the Strand", not far from village of Somerset; and at Kalk Bay, Cape of Good Hope, in sand dunes near the seashore]
Remarks The number of specimens examined was not noted in Benson's original description.

Genus *Cyclocystis* H. Watson, 1934

Cyclocystis charybdis (Benson, 1856)

Helix charybdis Benson, 1856c: 436
Trachycystis charybdis (Benson); Connolly, 1912: 135
Trachycystis (*Cyclocystis*) *charybdis* (Benson); Watson, 1934: 167, Pl. xx, Fig. 14–16, Pl. xxi, Fig. 40; Connolly, 1939: 192
Type material UMZC I.104230, **Fig. 61 A** (syntype from the R. McAndrew collection labelled "*Discus Charybdis* Bens., Bens. col., Cape G.H." [Cape of Good Hope]. Two other circular labels give the same information, one of which also has "No 26" written in black ink at the top and "*H. Charybdis* B." written in blue ink, apparently in Benson's handwriting)
Original measurements: "Diam. major 5½, minor 4½. axis 2½ mill. Long. Apert. 3, lat. 2 mill."
Type locality South Africa: "Hab. ad Promontorium Bonae Spei… [lives at the Cape of Good Hope…] Mr. Layard found this species rarely, in company with *H. perplicata*, nobis, at the Waterfall, near the highest blockhouse, on the Table Mountain towards Rondebosch"
Remarks Benson (1856c: 436) mentioned three specimens provided by Edgar Layard but only one was used for the description: "Only three specimens were taken. The specimen described is in bad order, especially about the aperture, the characters of which may be open to correction on the receipt of a better specimen." This species is the type of *Cyclocystis* Watson, 1934 by original designation.

Cyclocystis vorticialis (Benson, 1850)

Helix vorticialis Benson, 1850a: 216; Pfeiffer, 1853 [in 1853–1854], 1(12$_3$), 382: pl. 141, figs 28–30: Reeve, 1853 [1851–1854], 7 (*Helix*): pl. 174, species 1181
Trachycystis vorticialis (Benson); Connolly, 1912: 149
Trachycystis (*Cyclocystis*) *vorticialis* (Benson); Connolly, 1939: 193
Type material UMZC I.103605 (three syntypes from the R. McAndrew collection labelled "*Discus Vorticialis* Bens., Bens. col., Cape G.H." [Cape of Good Hope], one of which (UMZC I.103605.A, **Fig. 61 B**) is hereby designated the lectotype); UMZC I.103610 (four paralectotypes from the R. McAndrew collection labelled "*vorticialis* Bens., Bens. col., Cape")
Original measurements: "Diam. major 6, minor 5, axis 3 mill."
Other material NHMUK 1912.8.16.281–282 (two shells from the collection of E.L. Layard); NHMUK 1937.12.30.4890–4891 (two shells from the M.W. Connolly collection labelled "The type is in Stettin Mus")
Type locality South Africa: "Hab. ad Promontorium Bonae Spei, rarior, sub lapidibus" [lives at the Cape of Good Hope, rarely, under stones]
Remarks Benson (1850a: 216) based his description on specimens from several different localities: "Unfrequent near Three-anchor Bay, Green Point; and at Camp Ground near Rondebosch, adhering to the undersides of stones; alive in May and July 1846; dead at "the Strand", False Bay." Connolly (1912: 149; 1939: 193) stated that the type was in the BM but the basis of this claim in not clear and it contradicts information given on the label cited above for the specimens from his own collection. If the type was in Stettin Museum it is unlikely to have survived destruction during World War II (Dance, 1986: 210, 222, but see Herbert and Mousalli, 2010:114). Both of these statements constitute potential lectotype designations, but are invalid because the specimens concerned are not clearly identified in both cases. We therefore designate a lectotype from the Benson collection.

Genus *Lyrocystis* H. Watson, 1934

Helix munda Benson, 1850

Accepted as *Lyrocystis cosmia* (L. Pfeiffer, 1852);
Helix cosmia Pfeiffer, 1852 [in 1841–1854]: 112

Helix munda Benson, 1850b, 6: 253 (non *Helix munda* C.B. Adams, 1849)

Type material not located
Original measurements: "Diam. major 7, minor 5½, axis 3 mill. (spec. nostr.) [my specimen]"
Type locality South Africa: "sub monte Capitis Leonis prope Camp's Bay, Prom. Bon. Spei" [at the foot of the Lion's Head mountain near Camps Bay, Cape of Good Hope]
Remarks Benson (1850b: 254) found "a single specimen of this delicate shell under trees and fallen leaves in the ravine between the Lion's Head and Table Mountain, near Camp's Bay". He also mentioned a larger, un-named specimen from "Table Mountain" in the BM that he identified as the same species. Recognising that Benson's name was preoccupied by *Helix munda* C.B. Adams, 1849, Pfeiffer (1851: 16) proposed *Helix cerea* as a replacement name. However, this name was also preoccupied (Gould, 1850) and since both *Helix munda* and *Helix cerea* are junior primary homonyms, Pfeiffer (1852 [in 1841–1854]) introduced *Helix cosmia* as a replacement name for both Benson's *Helix munda* and his own *Helix cerea*. It appears that Benson sent the syntype from his personal collection to Pfeiffer for examination, and this shell was illustrated to accompany the description of *H. cosmia* (Pfeiffer, 1852 in 1841–1854, pl. 143, figs 6–7). Whether this specimen was ever returned to Benson, or destroyed together with much of Pfeiffer's material during World War II, is not known. The larger syntype in the BM collection cannot be traced, rendering Pfeiffer's illustration the only surviving record of Benson's type series. Connolly (1939: 225) regarded both this species and *Helix omphalion* Benson, 1864 as synonyms of *Lyrocystis cosmia* (L. Pfeiffer, 1852).

Helix omphalion Benson, 1864

Accepted as *Lyrocystis cosmia* (L. Pfeiffer, 1852);
Helix cosmia Pfeiffer, 1852 [in 1841–1854]: 112

Helix omphalion Benson, 1864b: 494
Type material UMZC I.103190.A, **Fig. 61 C** (one of three syntypes from the R. McAndrew collection labelled "*Discus Omphalion* Bens., Bens. col., Cape G.H." [Cape of Good Hope])
Original measurements: "Diam. major 4½, minor 4, axis 2½ mill."
Type locality South Africa: "Habitat prope Simonstown. Teste J.S. Hawkins" [Habitat: near Simonstown. Seen by J.S. Hawkins]
Remarks The number of specimens provided by John Sydney Hawkins was not noted in Benson's original description. In a letter to Hawkins dated 30th April 1864 (ZOO_MSS_HAW), Benson remarked: "*H. omphalion*, of which you gave me examples, was marked No. 37"; on a separate list of specimens he recorded that "No. 37" was "Retained by permission". Connolly (1912: 93; 1939: 226) noted that specimens of *omphalion* are in the UMZC. Connolly (1939: 225) placed *Helix omphalion* in the synonymy of *Lyrocystis cosmia* (L. Pfeiffer, 1852).

Lyrocystis perplicata (Benson, 1851)

Helix perplicata Benson, 1851b: 104; Pfeiffer, 1853 [in 1853–1854], 1(12$_3$), 381: pl. 141, figs 20–21; Reeve, 1853 [in 1851–1854], 7 (*Helix*), pl. 173, species 1173
Trachycystis (*Lyrocystis*) *perplicata* (Benson); Connolly, 1912: 141; 1939: 226; Watson, 1934: 171
Lyrocystis perplicata (Benson)
Type material UMZC I.103730, **Fig. 61 D** (syntype from the R. McAndrew collection labelled "*Discus Perplicatus* Bens., Bens. col., Cape G.H." [Cape of Good Hope]); UMZC I.103735 (three syntypes from the R. McAndrew collection labelled "*Discus Perplicatus* Bens., Bens. col., Cape G.H." [Cape of Good Hope])
Original measurements: "Diam. major 7, minor 6, axis 4½ mill."
Other material NHMUK 1954.6.2.114–116 (three shells from the J.S. Hawkins collection labelled "*Helix perplicata* Benson, ?Paratypes, Table Mts, back of Newlands, S. Africa")
Type locality South Africa: "Hab. in sylvis humidis, in stirpibus arborum fungisque putridis prope Newlands, ad basin montis Teufelberg, P.B.S." [lives in damp woodland, in fungus and rotten tree stumps near Newlands, toward the foot of Table Mountain, Cape of Good Hope]
Remarks Benson (1851b: 104) described the type series thus: "I found a single live specimen of this shell, in June 1846, imbedded in an offensively scented fungus growing in the damp woods between Newlands and the Devil's Mountain ... Dead specimens (only one of which was perfect) occurred in the hollow stump of a decayed tree at the same place. The living specimen was broken soon after its capture in consequence of its extreme fragility." Connolly (1912: 141–142; 1939: 227) stated that originals of *perplicata* are in the UMZC.

Lyrocystis prionacis (Benson, 1864)

Helix prionacis Benson, 1864b: 493
Trachycystis (*Lyrocystis*) *prionacis* (Benson); Watson, 1934: 176; Connolly, 1939: 227
Lyrocystis prionacis (Benson)
Type material not located
Original measurements: "Diam. major 6, minor 5, axis 3 mill."

Type locality South Africa: "Habitat prope Bredasdorp" [Habitat: near Bredasdorp]
Remarks Benson based his description on a single shell provided by Edgar Layard, noting its similarity to *Helix browningii*, which he described in the same paper. These taxa are now regarded as conspecific, so the name *prionacis* has priority. In a letter to J.S. Hawkins dated 30th April 1864 (ZOO_MSS_HAW), Benson recalled that he had returned the holotype to Layard. No specimens labelled "*prionacis*" with any links to the E.L. Layard collection could be located.

Helix browningii (Benson, 1864)

Accepted as *Lyrocystis prionacis* (Benson, 1864);
Helix prionacis Benson, 1864b: 493

Helix browningii Benson, 1864b: 493
Type material not located
Original measurements: "Diam. major 5, minor 3, axis 3 mill."
Other material UMZC I.103225.A, **Fig. 61 E** (one of two shells from the R. McAndrew collection labelled "*Discus Browningii* Bens., Bens. col., Cape G.H." [Cape of Good Hope])
Type locality South Africa: "Habitat prope Cape Point" [lives near Cape Point]
Remarks Benson (1864b: 493) based his original description on two shells: "I examined two specimens in the collection of Mr J. Sydney Hawkins, by whom they had been brought from the Cape". These specimens had been collected by George Wing Browning and were mentioned in a letter from Benson to Hawkins, dated 30th April 1864 (ZOO_MSS_HAW), in which Benson noted that he was returning the shells to Hawkins. Connolly (1912: 143; 1939: 227) stated that the "originals" of *browningii* are in the UMZC, but it appears that these shells were obtained later in accordance with Benson's request to Hawkins in the same letter: "If you can come upon more of *H. browningi* [sic] I shall be very glad to get one". Hawkins, in turn, returned the shells to Browning: "I return your specimens of *H. browningii* (No. 39), & also of *H. omphalion* (No. 37)" (letter to G.W. Browning, dated 20th May 1864, ZOO_MSS_HAW). The whereabouts of the type series is therefore unknown. This species is now considered to be synonymous with *Lyrocystis prionacis* (Benson, 1864), which has priority by virtue of its earlier description on the same page (Benson, 1864b: 493).

Genus *Phaulocystis* H. Watson, 1934

Phaulocystis petrobia (Benson, 1851)

Helix petrobia Benson, 1851b: 105 Pfeiffer, 1852 [in 1841–1854], pl. 141, figs 25–27; 1853, 1853–54: 382; Reeve, 1853 [in 1851–1854], 7 (*Helix*): pl. 173, species 1169
Trachycystis petrobia (Benson); Connolly, 1912: 142
Trachycystis (*Phaulocystis*) *petrobia* (Benson); Connolly, 1939: 201
Type material not located
Original measurements: "Diam. major 5½, minor 4½, axis 3 mill."
Other material UMZC I.103750 (two shells from the R. McAndrew collection labelled "*Discus petrobia*? Bens., Cape G.H.?" [Cape of Good Hope?], no collection data)
Type locality South Africa: "Hab. sub lapidibus, prope High Constantia, P.B.S." [Habitat: under stones, near High Constantia, Cape of Good Hope]
Remarks Benson (1851b: 105) remarked that he "got a single specimen alive" but it is possible that he may have found others that were dead. At least one shell was sent by Benson to Pfeiffer, who figured it (Pfeiffer, 1852 [in 1841–1854]), but its current whereabouts is unknown. According to Connolly (1939: 202) no authentic example of *T. petrobia* could be traced as the specimens in the McAndrew collection in Cambridge, doubtfully attributed to it, differ so widely from Benson's original description. He stated that specimens in the UMZC were closely allied to *Helix jucunda* L. Pfeiffer, 1864, a much larger species "with far stronger spiral sculpture on the later whorls and base, on which it forms a perfect open network with the transverse costulae" (Connolly, 1939: 202).

Genus *Xerocystis* H. Watson, 1934

Xerocystis capensis paludicola (Benson, 1850)

Helix paludicola Benson, 1850b: 253; Pfeiffer, 1853 [in 1853–1854], 1(12$_3$), 358: pl. 137, figs 4–5; Reeve, 1853 [in 1851–1854], 7 (*Helix*): pl. 174, species 1179
Phortion paludicola (Benson); Connolly, 1912: 130
Trachycystis (*Xerocystis*) *capensis* (Pfeiffer) var *paludicola* Benson; Connolly, 1939: 229
Type material UMZC I.103615.A, **Fig. 61 F** (one of 10 syntypes from the R. McAndrew collection labelled "*Theba Paludicola* Bens., Bens. col., Cape G.H." [Cape of Good Hope])
Original measurements: "Diam. major 5 1/3 mill., minor 5 mill., axis 3½."
Type locality South Africa: "Hab. in palude prope Baszaarm's Kraal, inter Diep Rivier et Muysenberg Prom. Bon. Spei, in floribus Zantedeschiae

AEthiopicae, et ad marginem paludis humidum, cum Succineae specie reptans" [lives in marshes near Baszaarm's Kraal, between Diep River and Muysenberg Cape of Good Hope, in the flowers of *Zantedeschia aethiopica*, and at the edge of the humid swamp, crawling with species of *Succinea*]

Remarks Benson based his description on several specimens. Connolly (1939: 230) stated that the originals of this species were in the UMZC. This species is now thought to be a variety of *Xerocystis capensis* (L. Pfeiffer, 1841). Connolly (1939: 229) wondered whether it might nevertheless be useful to retain the varietal name *paludicola* for the population of small shells that inhabit the type locality and a few other damper spots than those frequented by the more solid typical form. He also noted that the *paludicola* forms are "occasionally ornamented with a large number of close, very narrow purple bands which impart rather a distinctive appearance to the shell" (Connolly, 1939: 229).

Genus *Luinodiscus* Iredale, 1937 [42]

Luinodiscus cygnea (Benson, 1853)

Helix cygnea Benson, 1853a: 30; Reeve, 1854 [in 1851–1854], 7 (*Helix*): pl. 174, species 1182; pl. 191, species 1313

Charopa (*Thalassia*) *cygnea* (Benson); Tryon, 1886: 213, Pl. 62, Fig. 50

Luinodiscus cygnea (Benson); Smith, 1992: 193

Type material UMZC I.103775.A, **Fig. 62 A** (one of 11 syntypes from the R. McAndrew collection labelled "*Discus Cygnea* Bens., Bens. col., Swan R." (**Fig. 62 C**), with a later label written by Bishop stating "Type" [i.e. syntypes])

Original measurements: "Diam. major 4, minor 3½, axis 1½ mill."

Other material NHMUK 1978104 (seven shells from the H. Cuming collection labelled "*cygnea* Bens., …mantle Swan R…, MC" [Museum Cuming], with later labels stating "not" [*cygnea*] and "*sublesta* Benson, Freemantle, W.A." [Western Australia])

Type locality Australia: "Hab. ad vicum Perth, Fluvii Cygnorum Australiae Occidentalis. Teste Dr. J.F. Bacon" [lives at the village of Perth, Swan River, western Australia, according to Dr J.F. Bacon].

Remarks The number of specimens provided by Bacon was not noted in Benson's original description. The specimens from the Cuming collection are likely to have been obtained from the sale of Bacon's specimens at auction in 1856.

Luinodiscus sublesta (Benson, 1853)

Helix sublesta Benson, 1853a: 30; Reeve, 1853 [1851–1854], 7 (*Helix*): pl. 174, species 1177; Cox, 1868: 16, Pl. 11, Fig. 10

Charopa (*Thalassia*) *sublesta* (Benson); Tryon, 1886: 213, Pl. 62, Fig. 51

Luinodiscus sublesta (Benson); Smith, 1992: 193

Type material UMZC I.103770.A, **Fig. 62 B** (one of three syntypes from the R. McAndrew collection labelled "*Discus Sublesta* Bens., Bens. col., W. Australia" (**Fig. 62 D**). Another label in Martin Bishop's handwriting reads "Type UMZC 2398")

Original measurements: "Diam. major 3, minor 2½, axis 1 mill."

Other material NHMUK 1962715 (two shells from the H. Cuming collection labelled "Freemantle, Western Australia").

Type locality Australia: "Hab. prope urbem Freemantle Fluvii Cygnorum" [lives near the town of Freemantle, Swan River]

Remarks The number of specimens examined was not noted in Benson's original description. There is no basis to Reeve's (1853) claim that this species is "operculated", still less that it should be referred to *Cyclostoma*.

Subfamily THYSANOTINAE [43]

Genus *Ruthvenia* Gude, 1911

Helix puteolus Benson, 1853

Accepted as *Ruthvenia clathratula* (L. Pfeiffer, 1850); *Helix clathratula* Pfeiffer, 1850: 67

Helix puteolus Benson, 1853c: 92; Reeve, 1854 [in 1851–1854], 7 (*Helix*): pl. 190, species 1334

Type material UMZC I.104565.A, **Fig. 62 E** (one of five syntypes from the R. McAndrew collection labelled "*Discus Clathratula* Pfr., Bens. col., Ceylon")

Original measurements: "Diam. major 5½, minor 5, axis 2½ mill."

Other material UMZC I.104570 (three shells from the R. McAndrew collection labelled "*Helix clathratula* Pfr, *Helix puteolus* Benson, Ceylon", no collection data)

Type locality Sri Lanka: "in saxis ad portas "Balcadua" dictas, Insulae Ceylon" [amongst rocks at the pass known as "Balcadua", Island of Ceylon]

Remarks The number of specimens provided by Edgar Layard was not noted in Benson's original description. Pfeiffer (1859: 116) listed *H. puteolus* as a synonym of *Ruthvenia clathratula* (L. Pfeiffer, 1850), a view subsequently accepted by Benson (1860i: 247; see also Gude, 1914a: 28, Fig. 7).

Genus *Thysanota* E. von Martens, 1860

Thysanota crinigera (Benson, 1850)

Helix crinigera Benson, 1850a: 214; Reeve, 1852 [in 1851–1854], 7 (*Helix*): pl. 125, species 746; Hanley and Theobald, 1872 [in 1870–1876]: 27, pl. 60, Fig. 7
Helix (*Thysanota*) *crinigera* Benson; Blanford, 1863b: 86
Thysanota crinigera (Benson); Godwin-Austen, 1907 [in 1897–1914]: 189, pl. 112, Fig. 2 (anatomy); Gude, 1914a: 12; Ramakrishna et al., 2010: 207; Raheem et al., 2014: 73, figs 41E–F
Type material UMZC I.103580.A, **Fig. 62 F** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 73) from the R. McAndrew collection labelled "*Iberus* (*Thea*) *Crinigerus* Bens., Bens. col. Nilgherries"); UMZC I.103580.B, **Fig. 62 G** (paralectotype from the same lot)
Original measurements: "Diam. major 12½, minor 12, alt. 6½ mill."
Type locality India: "Hab. ad latus montium Nilgheries versus Orientem spectans. Teste Jerdon"
[lives on the flanks of the Nilgiri Hills, looking east, according to Jerdon]
Remarks The number of specimens provided by Thomas Jerdon was not noted in Benson's original description. This species is endemic to the Western Ghats (Raheem et al., 2014).

Genus *Philalanka* Godwin-Austen, 1898

Philalanka bidenticulata (Benson, 1852)

Helix bidenticulata Benson, 1852a: 405; Reeve, 1853 [in 1851–1854], 7 (*Helix*): pl. 174, species 1184; Hanley and Theobald, 1872 [in 1870–1876]: 27, Pl. 60, Fig. 6
Helix (*Laoma*) *bidenticulata* Benson; Tryon, 1887: 69, Pl. 13, Fig. 59
Philalanka bidenticulata (Benson); Gude, 1914a: 20; Ramakrishna et al., 2010: 203; Raheem et al., 2014: 74, Fig. 42E
Type material UMZC I.103915, **Fig. 63 F** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 74, Fig. 42E) from the R. McAndrew collection labelled "*Conulus Bidenticulatus* Bens., Bens. col., Nilgherries")
Original measurements: "Diam. major 3, minor 2 2/3, axis 2 1/3 mill."
Type locality India: "Hab. in montium Nilgherries vallibus calidioribus. Teste Jerdon" [lives in the warmer valleys of the Nilgiri Hills, according to Jerdon]
Remarks The number of specimens provided by Thomas Jerdon was not noted in Benson's original description. This species is endemic to the Western Ghats.

Philalanka mononema (Benson, 1853)

Helix mononema Benson, 1853c: 92; Reeve, 1854 [in 1851–1854], 7 (*Helix*): pl. 191, species 1339; Hanley and Theobald, 1874 [in 1870–1876]: 37, Pl. 87, Figs 2, 3
Nanina (*Microcystis*) *mononema* (Benson); Nevill, 1878: 41
Sitala mononema (Benson); Godwin-Austen, 1882 [in 1882–1888]: 41, Pl. 9, Fig. 6
Nanina monomena [sic] (Benson); Tryon, 1886: 57, Pl. 25 Fig. 33; 1887: 57, Pl. 25, Fig. 33
Philalanka ? *mononema* (Benson); Godwin-Austen, 1898: 12; Gude, 1914a: 21
Material a neotype (NHMUK 1912.8.16.349, **Fig. 63 A)** is hereby designated from a series of two shells in the collection of E.L. Layard labelled "*Sitala mononema*, B., Ceylon, *Kaliella* Blfd., *Trochomorpha* Alb. Paetel, Benson's types"). We have designated a neotype with the express purpose of clarifying the taxonomic status of *P. mononema* (see below).
Original measurements: "Diam. major 5, minor 4½, axis 4 mill."
Other material NHMUK 1912.8.16.350, **Fig. 63 B** (second specimen from the neotype lot)
Type locality Sri Lanka: "Hab. ad Heneratgodde" [lives at Heneratgodde]
Remarks Benson's original description was based on a single shell: "Mr Layard had not been able to procure a second specimen." The whereabouts of Benson's holotype is unclear. No specimens are present in the McAndrew Collection in the UMZC, suggesting that he either did not retain the shell or that it is lost. The labelling of NHMUK 1912.8.16.349 confusingly states "Benson's types", although only one of them can be the holotype. Neither, however, is a close match to Benson's original measurements, one being larger (**Fig. 63 A**) and the other smaller (**Fig. 63 B**). Given these uncertainties, we therefore designate a neotype.

Genus *Glyptaulax* Gude, 1914

Glyptaulax artificiosa (Benson, 1856)

Helix artificiosa Benson, 1856f: 249; Theobald, 1857: 250; Pfeiffer, 1860 [in 1854–1869], 1: 131: pl. 36, figs 8–10; Hanley and Theobald, 1872 [in 1870–1876]: 26, Pl. 55, Fig. 3
Nanina artificiosa (Benson); Nevill, 1878: 54
Helix (*Patula* (*Punctum*)) *artificiosa* Benson; Tryon, 1887: 33, Pl. 7, Fig. 82
Glyptaulax artificiosa (Benson); Gude, 1914a: 14
Type material UMZC I.103035.A, **Fig. 63 C** (one of four syntypes from the R. McAndrew collection

labelled "*Discus Artificiosus* Bens., Bens. col., Burmah" (**Fig. 63 D**))
Other material NHMUK 1888.12.4.629–631, **Fig. 63 E** (one of three shells from the W. Theobald collection labelled "*H.* (*Macrochlamys*?) *artificiosa* Benson (types), Phaiethan Hill, Tenasserim")
Original measurements: "Greatest length of the shell 1.4 inches"
Type locality Burma: "ad Phie Than vallis Tenasserim" [at Phie Than in the Tenasserim Valley]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. Theobald (1857: 250) later noted that this species was common but had only been found at "Phaiethan". Despite the label, we do not consider NHMUK 1888.12.4.629–631 to form part of the type series as there is no direct link to Benson. This is the type species of *Glyptaulax* Gude, 1914 by original designation.

Superfamily UROCOPTOIDEA

Family CERIONIDAE

Genus *Cerion* Röding, 1798

Subgenus *Strophiops* Dall, 1894

***Cerion* (*Strophiops*) *regium* (Benson, 1849)**

Pupa regia Benson, 1849c: 125
Cerion (*Strophiops*) *regium* (Benson); Pilsbry and Vanatta, 1896: 321; Pilsbry, 1901–1902: 236, pl. 35, figs 17–24, Pl. 47, Fig. 40; Zilch, 1960: 521
Type material UMZC I.105000.A, **Fig. 63 G** (one of two syntypes from the R. McAndrew collection labelled "*Pupa Regia* Bens., Bens. col., Nankin"; a later addition in pencil reads "=*decumana* Fer.")
Original measurements: "Long. 43 mill., lat. 23; aperturae long. perist. incl. 18 mill. Lat. 9 millim."
Type locality China: "Hab. prope Nanking, China" [lives near Nanking, China]. Certainly an error.
Remarks In his original description, Benson implied that there was only one specimen: "Brought by the late Dr. D. King, H.M.S. Cornwallis, and presented by him to Dr. Cantor, to whose kindness I am indebted for the specimen". However, the fact that there are two shells supposedly from China present in the Benson collection suggests that they might be syntypes. The UMZC shells are recorded as coming from Benson's published type locality, but their provenance has clearly been confused because this genus is found almost exclusively on islands in the West Indies and is otherwise unknown in China. Indeed, Pilsbry (1901–2) included *regia* in the "group of *Cerion regina*", which occurs only in the southeastern Bahamas. Pilsbry (1901–1902: pl. 35, figs 22–23) copied Küster's figure of Benson's type (Küster, 1852: Pl. 17, Fig. 13–14), which has broadly similar dimensions to the specimen illustrated here but has a slightly greater development of parietal callus.

Infraorder SUCCINEOIDEI [= Elasmognatha]

Superfamily SUCCINEOIDEA

Family SUCCINEIDAE

Subfamily SUCCINEINAE

Genus *Oxyloma* Westerlund, 1885

***Oxyloma orientalis* (Benson, 1851)** comb. nov.

Succinea orientalis Benson, 1851a: 262; Nevill, 1878: 213
Type material a neotype (NHMUK 20180282/1, **Figs 64 A–B**) is hereby designated from a series of two specimens labelled "*Succinea orientalis* Benson, leg. Cantor, 'Chusan', type loc. Macao"). We have designated a neotype with the express purpose of clarifying the taxonomic status of *O. orientalis* (see below).
Original measurements: "Long. 10, diam. 6 mill.; long. apert. 6, lat. 4."
Other material NZSI M.22625/4 (four specimens labelled "*Succinea orientalis* Bens., Chusan")
Type locality China: "Hab. ad Macao, Imperii Sinensis. Cantor" [lives on Macao, Chinese Empire. Cantor]. At the time Portugal administered Macao and considered it to be an overseas province of Portugal
Remarks The number of specimens provided by Theodore Cantor was not noted in Benson's original description. Nevill (1878: 213) listed three specimens in the Indian Museum from "Chusan (typical); coll Dr Cantor, ex Damon." Four specimens with similar labelling ("Chusan (typical); coll Dr Cantor, ex Damon") and with the registration number M22625/4 are reportedly in the ZSI. It is not clear if these are the same four specimens preserved in ethanol that were transferred from the ZSI to the BM(NH), with the same registration number M22625/4, or if eight examples originally existed. Only two of could be located (NHMUK 20180282); the original labels are missing but were transcribed as "Cantor, 'Chusan', Macao, types". The locality of "Chusan" given for the aforementioned material is almost certainly incorrect, probably an error based on conflation with the material from Chusan described by Benson some years earlier. Indeed, in both Benson's original publication (Benson, 1842b) and the revised version (Benson, 1855a) an unnamed *Succinea* from Macao is listed but not described. The discrepancy between the three specimens listed by Nevill, the four that were transferred to the BM(NH) and the four supposedly still in the ZSI cannot be explained, and in view of

these uncertainties we have therefore designated a neotype. The two surviving specimens were dissected (FN) and the reproductive organs of NHMUK 20180282/1 are shown (**Fig. 64 D**). The prostate gland is elongate, comparable to that of *Oxyloma cleopatrae* (Pallary, 1909), and unlike those of *Succinea putris* (Linnaeus, 1758) and *Succinea kuntziana* Solem, 1959 that are squat being as wide as they are long. The gametolytic sac is also comparable to that of *O. cleopatrae* being almost globular whereas those of *Succinea putris* and *Succinea kuntziana* are more ovoid. The penial appendix, absent in *Succinea putris* and *S. kuntziana*, is consistent with that shown in *O. cleopatrae* (Patterson, 1971). Based on these consistencies with *O. cleopatrae* and the shell being typical of that of *Oxyloma*, we place *Succinea orientalis* in *Oxyloma*. Specimens of *Succinea orientalis* in the Senckenberg Museum were listed by Yen (1939) from Hwang-Po, Kwangtung, Mirsbay, Kwangtung, Hong Kong and Hainan. Yen (1942) also noted that *Succinea chinensis* L. Pfeiffer,1857 closely resembles Benson's species.

Genus *Helisiga* Lesson, 1831

Succinea imperialis Benson, 1851

Accepted as *Helisiga santaehelenae* (Lesson, 1831);
Helisiga Sanctae-Helenae Lesson, 1831: 316

Succinea imperialis Benson, 1851a: 262
Type material not located
Original measurements: “Long. 19, diam. 13 mill.; long. apert. 15½, lat. 11 mill.”
Type locality St Helena
Remarks The number of specimens provided by Lt. Lefroy was not recorded in Benson’s original description. Benson was aware that Lesson had described a species of *Succinea* from St Helena but felt confident enough to describe his material as new since it differed markedly in size. However, *Succinea imperialis* is now regarded as a synonym of *Helisiga santaehelenae* (Lesson, 1831), the type species of *Helisiga* Lesson, 1831 (Crowley and Pain, 1977: 537).

Infraorder RHYTIDOIDEI

Superfamily RHYTIDOIDEA

Family RHYTIDIDAE

Subfamily RHYTIDINAE

Genus *Nata* H. Watson, 1934

Nata dumeticola (Benson, 1851)

Helix dumeticola Benson, 1851b: 106; Reeve, 1853 [in 1851–1854], 7 (*Helix*): pl. 173, species 1172; Benson, 1856c: 437
Natalina dumeticola (Benson); Connolly, 1912: 93
Nata dumeticola (Benson); Watson, 1934: 158, Pl. xix, Fig. 9; Connolly, 1939: 101; Schileyko, 2000: 747, Fig. 973C; Herbert and Moussalli, 2016: 24, figs 3A, 4B, 6B, 7C, 15–18
Type material UMZC I.104960 (three syntypes from the R. McAndrew collection labelled “*Discus Dumeticola* Bens., Bens. col., Cape of Good Hope”, one of which (UMZC I.104960.A, **Fig. 64 C**) is hereby designated as the lectotype. An additional label reads "*Discus dumeticola*, Benson, Cape of Good Hope, Benson Coll., “hardly to be separated from *vernicosa*, Krauss” [E.R. Sykes 26.x.97]); UMZC I.104130 (three syntypes from the R. McAndrew collection labelled "*H. Dumeticola* Bens., Bens. col.", no locality data)
Original measurements: “Diam. major 11 mill., minor 9, alt. 4½”
Other material NHMUK 1912.8.16.206–208 (three shells from the collection of Edgar Layard labelled “*Natalina dumeticola* Bens., S. Africa” and in other handwriting "Benson's types")
Type locality South Africa: “Hab. rarior derelicta ad Green Point, P.B.S., frequentior in dumetis littoralibus prope Simon’s Town et Strand, ad littora Sinus Falsi” [Habitat: more rarely alone at Green Point, Cape of Good Hope, more frequently in the thickets by the seashore near Simon’s Town and Strand, toward the shore of False Bay].
Remarks The number of specimens examined was not noted in Benson’s original description, but it is likely that there were several since he recorded it at more than one locality and ‘frequently’ near Simon’s Town. Benson did not clearly state the source of his specimens, but since all of the other species described in the same paper (Benson, 1851) were collected by him on his final visit to the Cape in 1846, we presume that the same applies to the type series of *dumeticola*. Connolly (1912: 93; 1939: 102) stated that “the type" is in the BM, presumably referring to the shells from the Edgar Layard collection that form NHMUK 1912.8.206–208. This cannot be accepted as a lectotype designation because the specimen to which Connolly was referring cannot be identified amongst the three specimens in that lot, and in any case Layard was not mentioned as a source of specimens by Benson, excluding his material from the type series. Herbert and Moussalli (2016: 24) recently designated the largest (11.4 mm) shell from NHMUK 1912.8.16.206–208 as the lectotype, although this designation is also invalid for the same reasons

outlined above. We have therefore designated UMZC I.104960.A, a Benson collection shell from the type locality, as the lectotype. Herbert and Moussalli included *Nata dumeticola* in their phylogeny, which showed it to be closely related to but distinct from *N. vernicosa* Krauss, 1848 (cf. comments by Sykes, above). *Nata dumeticola* is largely restricted to the winter-rainfall portion of the Fynbos Biome.

Subfamily CORILLINAE [37]

Genus *Corilla* H. Adams & A. Adams, 1855

Corilla anax (Benson, 1865)

Helix anax Benson, 1865b: 12; Hanley and Theobald, 1872 [in 1870–1876]: 26, Pl. 57, Figs 1–3
Helix (*Atopa*) *anax* Benson; Tryon, 1887: 157, pl. 33, figs 16–18
Corilla anax (Benson); Pilsbry, 1894 [in 1893–1895]: 148; Gude, 1914a: 59, Fig. 16
Type material UMZC I.103150.C, **Fig. 64 E** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 71–72) from the McAndrew collection labelled "*Anchistoma* (*Corilla*) *Anax* Bens, Bens col., E. Ind."); UMZC I.103150.A, **Fig. 64 F** (one of three paralectotypes from the same lot); NHMUK 1865.7.21.3 (two paralectotypes from the collection of Francis Day labelled "Travancore")
Original measurements: "Diam. major 23, minor 17½, axis 8 mill. Apert. lata vix 10, longa 9 mill."
Type locality India: "Habitat cum specie praecedente in montibus Travancoricis Mavillicurray dictis." [lives with the preceding species [*Helix basilessa*] in the so-called Mavillicurray Hills in Travancore]
Remarks The number of specimens provided by Francis Day was not mentioned in Benson's original description. Several lines of evidence suggest that the NHM specimens from the Day collection are amongst those examined by Benson. They were presented to the Museum by Day himself in 1865 and registered in July of that year, only a few months after Benson's description of the species had been published (in the January 1865 volume of the *Annals and Magazine of Natural History*). Day donated two lots from Travancore, the first (NHMUK 1865.7.21.2) an unidentified species of *Achatina* "to be described by Mr Benson" and the second (NHMUK 1865.7.21.3) two specimens of *Corilla anax*, registered as "*Helix* sp. described by Benson". The two specimens match the dimensions provided in Benson's description closely. Furthermore, Day's address is given as "Andover Lodge, Cheltenham", a property close to the house on Queen's Parade to which Benson had by that time retired, so it is likely that Benson was able to examine Day's material with ease. It is unclear when and from whom the Cambridge specimens of *C. anax* were obtained by Benson, although it is probable that they were part of a single collection made by Day. As regards the locality, Benson stated that the "Mavillikurray Hills are 2000 feet in height", so that it seems likely that he was referring to the foothills of the Western Ghats to the east of Kottayam and Mavelikkara (Raheem et al., 2014). *Corilla anax* is endemic to the Western Ghats (Aravind et al., 2014) and is the only extant member of the genus recorded outside of Sri Lanka.

Corilla odontophora (Benson, 1865)

Helix (*Corilla*) *odontophora* Benson, 1865a: 175; Hanley and Theobald, 1872 [in 1870–1876]: 26, Pl. 57, Figs 4–6; Nevill, 1878: 70
Helix (*Atopa*) *odontophora* Benson; Tryon, 1887: 157, pl. 33, figs 24–26
Corilla odontophora (Benson); Pilsbry, 1894: 148; Gude, 1896a: 91, Fig. 10; Gude, 1914a: 62, Fig. 18
Type material not located
Original measurements: "Diam. major 26, minor 19, alt. 8 mill."
Other material UMZC I.103295.A, **Fig. 64 D** (one of four shells from the R. McAndrew collection labelled "*Anchistoma* (*Corilla*) *Odontophora* Bens.", no locality or collection data)
Type locality Sri Lanka: "Habitat in montibus Ceylanicis prope Fort McDonald, Bandarewella, et Bibligamua ad altitudinem ped. 4500. Teste Dom. F. Layard" [Habitat: in the mountains of Ceylon near Fort McDonald, Bandarewella, and Biblimgamua, to a height of 4500 feet. Seen by Mr F. Layard]
Remarks Benson's description was based on 16 specimens provided by Frederick Layard, collected from different localities on the northern, eastern and southern margins of the Uva Basin in Sri Lanka's Central Highlands. The UMZC lot is not labelled as coming from the Benson collection, although this is likely. A recent molecular systematic study based on mitochondrial DNA sequence data indicates species-level or intraspecific differentiation between northern and eastern populations and between two geographically isolated eastern populations (Raheem et al., 2017). Although the shell morphology of northern, eastern and southern *C. odontophora* appears very similar, further detailed study is needed to understand the morphological and genetic variation of *C. odontophora* across its known range. Gude (1914a: 63) noted that the figure of this species in Hanley and Theobald (1872 [in 1870–1876], Pl. 57, Fig. 4) is rather misleading since it represents an immature specimen.

Infraorder ORTHALICOIDEI

Superfamily ORTHALICOIDEA

Family BOTHRIEMBRYONTIDAE [44]

Genus *Bothriembryon* Pilsbry, 1894

Subgenus *Bothriembryon* Pilsbry, 1894

***Bulimus baconi* Benson, 1854**

Accepted as *Bothriembryon* (*Bothriembryon*) *bulla* (Menke, 1843); *Bulimus bulla* Menke, 1843: 7

Bulimus baconi Benson, 1854a: 99
Type material UMZC I.103865, **Fig. 65 A** (syntype from the McAndrew collection labelled "*Bulimus* (*Cariedes*) *Baconi* Bens., Bens. col., Darlings Range, Aust."; a second label added by Martin Bishop states that this is the holotype)
Original measurements: "Axis 23, diam. 15, alt. apert. 12, diam. 9 mill."
Other material NHMUK 1974141 (two shells from the H. Cuming collection labelled "*B. baconi* Bens., Darling Range, Australia")
Type locality Australia: "Hab. in Australia occidentali" [lives in Western Australia]; "in Darling's Range, six miles from Henley Park on the Avon River"
Remarks The number of specimens provided by J.F. Bacon was not noted in Benson's original description. It is probable that the NHM lot was part of Bacon's collection, acquired by Cuming in 1856, although there is no documentary evidence to support this assertion. According to Smith (1992: 102) and Breure and Whisson (2012: 63) this is a junior synonym of *Bothriembryon bulla* (Menke, 1843).

Infraorder PUPILLOIDEI [= Orthurethra]

Superfamily PUPILLOIDEA

Family PUPILLIDAE

Genus *Pupilla* J. Fleming, 1828

Subgenus *Pupilla* J. Fleming, 1828

***Pupilla* (*Pupilla*) *eurina* (Benson, 1864)**

Pupa eurina Benson, 1864a: 139; Pfeiffer, 1868 [in 1847–1877]: 300; Hanley and Theobald, 1874 [in 1870–1876]: 41, Pl. 101, Fig. 7
Pupilla eurina (Benson); Gude, 1914a: 283
Type material UMZC I.103110.A, **Fig. 65 C** (one of seven syntypes from the R. McAndrew collection labelled "*Pupa* (*Pupilla*) *Eurina* Bens., Bens. col., Ind."; a second specimen, UMZC I.103110.B, **Fig. 65 D**, is also figured)
Original measurements: "Long. 2½, diam. 1 mill."
Type locality ?Nepal: "Habitat ad Tribeni Ghát fluminis Gogra. Detexit W. Theobald" [lives at Tribeni Ghát, Gogra River. Discovered by W. Theobald]
Remarks Benson (1864a: 139) based his description on more than one specimen: "The specimens sent by Mr. Theobald were all derelict, and some are deficient in colour." Eight specimens from the Benson collection in Cambridge were sent to Gude (1914a: 284), who noted that they agree with the figure of this species in *Conchologia Indica* (Hanley and Theobald, 1874 [in 1870–1876]: Pl. 101, Fig. 7) but the columellar margin is more obliquely ascending than shown. The original locality cannot be traced and their ultimate source is uncertain since Godwin-Austen (1899: 260) explained that "typical specimens were found in the exuviae of the River Gogra at Tribeni Ghat. This river rises in the Tibetan plateau, and these shells may have been brought down thus from far back in the mountain range". Despite the attribution of the Benson material to "India", this species is therefore likely to have come from Nepal, where it is endemic (see discussion in Budha et al., 2015: 33).

***Pupilla gutta* (Benson, 1864)**

Pupa gutta Benson, 1864a: 138; Hanley and Theobald, 1874 [in 1870–1876]: 41, Pl. 101, Fig. 9; Theobald, 1878: 146
Pupilla gutta (Benson); Gude, 1914a: 285; Ramakrishna et al., 2010: 118
Type material not located
Original measurements: "Long. 1 2/3, diam. 1 mill."
Type locality India, Himachal Pradesh: "Habitat in valle Spiti, Kunawurensi. Detexit W. Theobald" [lives in the Spiti valley of Kunawur. Found by W. Theobald]
Remarks Benson based his original description on one shell: "A single specimen, apparently adult, was received from Mr. Theobald". Hanley and Theobald (1874: 41) mistakenly thought that two syntypes existed, stating that "Both the known types have been crushed", but this error is likely to be Hanley's, since Theobald (1878: 146) later noted that "the type [of *Pupa gutta*] has only been taken by me in Spiti." Gude (1914a: 285) thought that the illustration in *Conchologia Indica* (Hanley and Theobald, 1874: Pl. 101, Fig. 9), which was taken from a photograph, was of an immature shell, although this is incompatible with Benson's original assertion that the holotype was a mature specimen. We follow Gude in the taxonomic placement of this species, but in view of the abovementioned uncertainties and the fact that Benson's holotype cannot be traced, we here treat this taxon as a *nomen dubium*.

Genus *Microstele* O. Boettger, 1886 [45]

Microstele muscerda (Benson, 1853)

Pupa muscerda Benson, 1853c: 94; Pfeiffer, 1859 [in 1847–1877]: 680; Hanley and Theobald, 1873 [in 1870–1876]: 65, Pl. 160, Fig. 2; Reeve and Sowerby, 1876 [in 1875–1878], 20 (*Pupa*): Pl. 7, Fig. 56
Pupa (*Vertigo*) *muscerda* Benson; Nevill, 1878: 198
Pupilla muscerda (Benson); Gude, 1914a: 286; Ramakrishna et al., 2010: 118
Microstele muscerda (Benson); Raheem et al., 2014: 61, Fig. 35A–B
Type material UMZC I.103977.A, **Fig. 65 E** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 61, Fig. 35A) from the R. McAndrew collection labelled "*Pupa Muscerda* Bens., Benson Coll., Ceylon")
Original measurements: "Long. 4, diam. 1½ mill."
Other material UMZC I.103977.B, **Fig. 65 F** (single shell from the R. McAndrew collection labelled with species name only, figured by Raheem et al., 2014: Fig. 35B); UMZC I.103975A and B (two shells from the R. McAndrew collection labelled "*Pupa Muscerda* B^n figured in Conch Indica – Ceylon"); NHMUK 1912.8.16.331–334 (four specimens from the E.L. Layard collection); MANCH E.A. 03094 (four shells from the E.L. Layard collection labelled "Ceylon, type")
Type locality Sri Lanka: "Hab. ad promontorium "Pedro" dictum" [lives on the promontory known as Point Pedro]; "Found by Mr. E. Layard in old posts, and on Palmyra trees ..."
Remarks Only one specimen in the McAndrew collection is definitively labelled as coming from the Benson collection, although it is likely that some of the other material came from that source. Although the specimens from Edgar Layard's collection in Manchester Museum are labelled "type", there is no evidence that Benson saw these shells at the time of their description and we therefore exclude them from the type series. *Microstele muscerda* is endemic to Sri Lanka and the Western Ghats (Raheem et al., 2014: 61).

Genus *Pupoides* L. Pfeiffer, 1854

Subgenus *Pupoides* L. Pfeiffer, 1854

Pupoides (*Pupoides*) *gemmula* (Benson, 1856)

Bulimus gemmula Benson, 1856c: 434
Pupoides gemmula (Benson); Groh, 1983: 175, Figs 15–16
Type material NHMUK 20150118/1, **Fig. 65 B** (one of three syntypes from the E.L. Layard collection labelled "St. Vincent, Cape Verde Ids")
Original measurements: "Long. 2 1/3, diam. 1 1/3 mill."
Type locality Cape Verde Islands: "ad insulam Sancti Vincentii Promontorii Viridis, sub lapidibus" [on the island of St Vincent, Cape Verde, under stones]
Remarks The number of specimens provided by Edgar Layard from "the west side of the island [São Vicente (St Vincent), Cape Verde Islands] under Duke's Head Mountain" was not noted in Benson's original description. Benson included this species in a group characterised by a "tubercle at the right angle of the parietal border" that had been "indifferently assigned to *Bulimus* and *Pupa*", although he did not propose a name for it. Morelet (1872: 200) thought that Benson's *gemmula* might be an insular form of the widespread *Pupoides coenopictus* (Hutton, 1834) that had been diminished in size by the aridity of the Cape Verde Islands.

Family ACHATINELLIDAE

Subfamily TORNATELLININAE

Tribe ELASMIATINI

Genus *Elasmias* Pilsbry, 1910

Elasmias cernicum (Benson, 1850)

Tornatellina cernica Benson, 1850b: 254; Nevill, 1878: 160; Germain, 1921: 207
Elasmias cernicum (Benson); Cooke and Kondo, 1961: 224; Griffiths and Florens, 2006: 80
Material a neotype (UMZC I.104940.A, **Fig. 67 A**) is hereby designated from a series of six shells from the R. McAndrew collection labelled "*Tornatellina Cernica* Bens., Bens. col., Mauritius"). We have designated a neotype with the express purpose of clarifying the taxonomic status of *E. cernicum* (see below).
Original measurements: "Long. 3 mill., diam. 2–2¼ mill."
Type locality Mauritius: "Hab. in sepibus apud Moka Insulae Mauritii" [lives in the bushes around Moka, Island of Mauritius]
Remarks Benson collected this species while on Mauritius, en route back to India from the Cape: "I discovered this interesting little species in February 1847 in the grounds of Sir D. Barclay at Moka". He noted that he had only collected two specimens himself, but "Sir D. Barclay writes that he has since been more successful in its capture". Barclay may therefore have sent more material to Benson prior to him publishing his description. The identity of the original type series amongst the Benson collection material is uncertain, and we have therefore designated one of them as the neotype. Cooke and Kondo (1961) stated that the whereabouts of the type is unknown. This small arboreal species is endemic to Mauritius and Réunion, where it can be locally common, often occurring on introduced plants such as Rose apple, *Syzygium jambos* (Griffiths and Florens, 2006).

Family CERASTIDAE

Genus *Gittenedouardia* Bank & Menkhorst, 2008 [46]

Gittenedouardia arenicola (Benson, 1856)

Bulimus arenicola Benson, 1856c: 433
Pachnodes arenicola (Benson); Kobelt and Möllendorff, 1903: 36
Edouardia arenicola (Benson); Connolly, 1939: 427; Herbert and Kilburn, 2004: 118
Gittenedouardia arenicola (Benson); Bank and Menkhorst, 2008: 101
Type material UMZC I.104930, **Fig. 67 B** (syntype from the R. McAndrew collection labelled "*Bulimulus* (*Petraeus*) *Arenicola* Bens. =*Natalensis* [illegible], Bens. col.", no locality data)
Original measurements: "Long. 17, diam. 15; long. apert. 10, lat. 8½ mill.; diam. anfr. supra aperturam ad carinam 11 mill."
Type locality South Africa: "Hab. ad colles arenosas prope sinum "Waterloo" dictum Caffrariae" [lives in the sandy hills near the bay known as "Waterloo" in Caffraria]
Remarks The number of specimens provided by Edgar Layard was not noted in Benson's original description. An annotation in Benson's handwriting in Hutton's copy of Benson (1856c) states "This is *Bulimus natalensis* of Krauss." This common species is widely distributed in eastern South Africa, where it inhabits dune, coastal lowland, riverine and mist-belt *Podocarpus* forest and riverine woodland (Herbert and Kilburn, 2004).

Genus *Rhachistia* Connolly, 1925

Rhachistia sanguineus (Benson, 1857)

Bulimus sanguineus Benson, 1857a: 328 (non *Bulimus sanguineus* Scopoli, 1777)
Buliminus (*Rhachis*) *sanguineus* (Benson); Nevill, 1878: 130
Rhachis sanguinea (Benson); Kobelt and Möllendorff, 1903: 39
Rachis (*Rachis*) *sanguineus* Barclay in Benson; Germain, 1921: 170
Rhachistia sanguineus (Barclay); Griffiths and Florens, 2006: 88
Type material UMZC I.102815, **Fig. 67 C** (one of six syntypes from the McAndrew collection labelled "*Orthalicus* (*Leptomerus*) *Sanguineus* Barkley, Bens. col., Mauritius")
Original measurements: "Long. 20, diam. 12 mill.; long. apert. 9, lat. 8 mill."
Type locality Mauritius: "Hab. prope Reduit, in vallibus angustis pagi Moka, Insulae Mauritii. Detexit Sir D.W. Barclay" [lives near Reduit, in the narrow valleys of the Moka district, Island of Mauritius. Discovered by Sir D.W. Barclay]
Remarks Benson attributed this species to Sir David Barclay, but this was only a manuscript name; Benson provided the first description and authorship therefore belongs to him. The number of specimens provided by Barclay was not noted in his original description. This Mauritian endemic was found alive in the 19th century on Mt. Ory but has not been found since and is now presumed extinct. Fossils still occur in the calcarenite cliff of Ile aux Fourquets, Mauritius (Griffiths and Florens, 2006).

Rhachistia vesiculata (Benson, 1859)

Bulimus vesiculatus Benson, 1859a: 99
Rachis (?) *vesiculatus* (Benson); Germain, 1921: 170
Rhachistia vesiculatus (Benson); Griffiths and Florens, 2006: 117
Type material not located
Original measurements: "Long. 13, diam. 7, apert. 6 mill. longa."
Type locality Mauritius: "insula Mauritii, rarissime" [Island of Mauritius, very rare]
Remarks Benson based his original description on a single specimen, found together with shells he described as *Helix caldwelli* and *Helix setiliris*, under roots of trees in humid native forest "in the heights of Plaine Wilhelm, towards the head of the Tamarind River". The taxonomic attribution is uncertain since the parietal tooth included in Benson's description is an unusual feature for a *Rhachistia* (Griffiths and Florens, 2006).

Family ENIDAE

Subfamily ENINAE

Tribe ENINI

Genus *Turanena* Lindholm, 1922

Subgenus *Turanena* Lindholm, 1922

Turanena (*Turanena*) *benjamitica* (Benson, 1859)

Bulimus benjamiticus Benson, 1859b: 393
Ena benjamitica (Benson); Mienis, 1977: 83
Turanena benjamitica (Benson); Heller, 2009: 300
Type material not located
Original measurements: "Long. 7½, diam. 3, apert. long. 2½ mill."
Type locality Israel: "Habitat prope Hierosolymam. Detexit Dr. Roth; specimen descriptum invenit Dom. E. Atkinson" [lives near Jerusalem. Discovered by Dr. Roth; specimen described by Mr. E. Atkinson]
Remarks According to Benson, this species was first discovered by Dr Roth "while in company with Mr Edward Atkinson, a surgeon in Jerusalem", who

obtained two dead shells. One of these specimens was sent to the Leeds Philosophical Institution (LPI) with a request that it be published using Roth's manuscript name. It is not clear how Benson became involved in this endeavor. The LPI's collections were eventually transferred to Leeds City Museum but it has not been possible to locate the syntype. This species is very rare and has been identified from only a few disconnected sites in the Mediterranean region (Mienis, 1977, 1978; Heller, 2009; Bössneck, 2011).

Genus *Pseudonapaeus* Westerlund, 1887 [47]

Pseudonapaeus domina (Benson, 1857) comb. nov.

Bulimus domina Benson, 1857a: 327; Pfeiffer, 1859 [in 1847–1877]: 425; Hanley and Theobald, 1870 [in 1870–1876]: 11, Pl. 22, Fig. 5
Napaeus domina (Benson); Theobald, 1878: 144
Buliminus (*Petraeus*) *domina* (Benson); Nevill, 1878: 136
Buliminus (*Subzebrinus*) *domina* (Benson); Kobelt and Möllendorff, 1903: 48
Ena (*Subzebrinus*) *domina* (Benson); Gude, 1914a: 245
Subzebrinus domina (Benson); Ramakrishna et al., 2010: 131
Type material UMZC I.102785.A, **Fig. 66 A** (one of two syntypes from the R. McAndrew collection labelled "*Buliminus* (*Napaeus*) *Domina* Bens., Bens. col., Cashmeer")
Original measurements: "Long. 23, diam. 9 mill.; long. apert. 9, lat. 6 mill."
Type locality India: "Hab. in regione Cashmiriana" [lives in the Kashmir region]
Remarks The number of specimens provided by Lady Elizabeth Gomm was not noted in Benson's original description.

Pseudonapaeus salsicola (Benson, 1857) comb. nov.

Bulimus salsicola Benson, 1857a: 327; Pfeiffer, 1859 [in 1847–1877]: 423; Hanley and Theobald, 1870 [in 1870–1876]: 10, Pl. 20, Fig. 8
Buliminus (*Petraeus*) *salsicola* (Benson); Nevill, 1878: 134
Buliminus (*Subzebrinus*) *salsicola* (Benson); Kobelt and Möllendorff, 1903: 49
Ena (*Subzebrinus*) *salsicola* (Benson); Gude, 1914a: 248
Buliminus (*Petraeomastus*) *salsicola* (Benson); Annandale and Rao, 1923: 390, pl. IX, figs 4, 4a, 5, 5a
Subzebrinus salsicola (Benson); Ramakrishna et al., 2010: 134
Type material UMZC I.102800, **Fig. 66 B** (syntype from the R. McAndrew collection labelled "*Bulimus* (*Petraeus*) *Salsicola* Bens., Bens. col., Punjab", here designated as the lectotype)
Original measurements: "Long. 18, diam. 8 mill.; long. apert. 8, diam. 6 mill."
Other material NHMUK 1888.12.4.1370–1373 (four shells from the W. Theobald collection labelled "*Bul.* (*Napaeus*) *salsicola* Benson (typical), Salt Range")
Type locality India: "Hab. in montibus salsiferis Pentepotamiae Indicae. Teste W. Theobald" [lives in the Salt Range of Pentepotamia [the Five Rivers], India, according to W. Theobald]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. Gude (1914a: 249) believed the type specimen to be lost: "The type of *E. salsicola* appears to have shared the fate of several other Bensonian types, for Dr. Doncaster informs me that it cannot be found". The specimen is clearly present in the UMZC, however. Annandale and Rao (1923: 390) reported that a series collected by Theobald and described by Benson was still intact in the Indian Museum and they illustrated two specimens, both of which they invalidly designated as lectotypes. To avoid further confusion, we have designated UMZC I.102800 as the lectotype.

Genus *Mirus* Albers, 1850 [48]

Mirus panos (Benson, 1853)

Bulimus panos Benson, 1853c: 94; Pfeiffer, 1859 [in 1847–1877]: 417
Buliminus (*Petraeus*) *proletarius* var *panos* (Benson); Nevill, 1878: 135
Ena (*Mirus*) *panos* (Benson); Gude, 1914a: 234, Fig. 87
Mirus panos (Benson); Naggs and Raheem, 2000: Fig. 8
Type material a neotype **(**NHMUK 1912.8.16.326, **Fig. 66 C)** is hereby designated from the collection of Edgar Layard labelled "*Bulimus panos* B., Ceylon, Nalande"). We have designated a neotype with the express purpose of clarifying the taxonomic status of *E. cernicum* (see below).
Original measurements: "Long. 11, diam. 5 mill."
Type locality Sri Lanka: "Hab. ad Nalande" [lives at Nalande]
Remarks The number of specimens provided by Edgar Layard was not noted in Benson's original description.

Mirus smithei (Benson, 1865)

Bulimus smithei Benson, 1865b: 15; Pfeiffer, 1868 [in 1847–1877]: 56; Hanley and Theobald, 1870 [in 1870–1876]: 10, Pl. 20, Fig. 3
Napaeus smithii (Benson); Theobald, 1878: 146
Buliminus (*Petraeus*) *smithei* (Benson); Nevill, 1878: 135
Buliminus (*Subzebrinus*) *smithei* (Benson); Kobelt and Möllendorff, 1903: 49
Ena (*Mirus*) *smithei* (Benson); Gude, 1914a: 235
Mirus smithei (Benson); Ramakrishna et al., 2010: 127

Type material UMZC I.103100, **Fig. 66 D** (syntype from the R. McAndrew collection labelled "*Bulimulus* (*Ena*) *Smithei* Bens., Bens. col., Punjab"); NHMUK 1888.12.4.1413 (syntype from the W. Theobald collection labelled "*Bul.* (*Napaeus*) *smithii*, Benson (typical), N.W. Himalayas")
Original measurements: "Long. 13, diam. 5. Apert. long. 4, lat 3½ mill."
Type locality India: "in montibus prope Roopur et Fagoo" [in the mountains near Roopur and Fagoo]
Remarks Benson based his original description on at least two specimens: "Mr. J. Doyle Smithe, F.G.S., got this shell in the hills on the right side of the river Sutlej, in the Punjab; and Mr. W. Theobald subsequently got it at Fagoo, on the Simla side of the river." Both of these localities are represented by the material listed above.

Mirus stalix (Benson, 1863)

Bulimus stalix Benson, 1863b: 322; Pfeiffer, 1868 [in 1847–1877]: 61; Hanley and Theobald, 1870 [in 1870–1876]: 11, Pl. 22, Fig. 3
Buliminus (*Petraeus*) *stalix* (Benson); Nevill, 1878: 135
Buliminus (*Subzebrinus*) *stalix* (Benson); Kobelt and Möllendorff, 1903: 49
Ena (*Mirus*) *stalix* (Benson); Gude, 1914a: 233
Mirus stalix (Benson); Naggs and Raheem, 2000: Fig. 10
Material a neotype (UMZC I.103275.A, **Fig. 66 E**) is hereby designated from a series of four shells from the R. McAndrew collection labelled "*Bulimus Stalix* Benson, Layard, Ceylon"). We have designated a neotype with the express purpose of clarifying the taxonomic status of *M. stalix* (see below). Another specimen from this lot is also illustrated (**Fig. 66 F**).
Original measurements: "Long. 20, diam. 7 mill."
Type locality Sri Lanka: "Habitat ad Boralande" [lives at Boralande]
Remarks The number of specimens provided by Frederick Layard from "the district of Upper Ourah, in Ceylon" was not noted in Benson's original description. Since "Layard" appears on the label of the UMZC lot it is likely to represent part of the type series, although it is not labelled as being from the Benson collection. The largest of the four shells agrees with the dimensions published by Benson but the smallest is much smaller.

Family FAUXULIDAE [49]

Genus *Tomigerella* L. Pfeiffer, 1879

Tomigerella fryanus (Benson, 1864)

Pupa fryana Benson, 1864b: 495
Jaminia (*Fauxulus*) *fryana* (Benson); Connolly, 1912: 186
Fauxulus (*Tomigerella*) *fryanus* (Benson); Connolly, 1939: 383
Type material UMZC I.104965, **Fig. 68 A** (one of two syntypes from the R. McAndrew collection labelled "*Pupa Fryana* Bens., Bens. col., Cape G.H." [Cape of Good Hope])
Original measurements: "Long. 8, diam. 4, supra aperturam 3 mill."
Other material NHMUK 1912.8.16.297–298 (two shells from the Edgar Layard collection labelled "*Pupa fryana* B., Bradasdorp, S. Africa"); NHMUK 1937.12.30.2835, **Fig. 68 B** (single shell from the M. Connolly collection labelled "*fryana* Benson, paratype, Bredastorp")
Type locality South Africa: "Habitat ad Bredasdorp. Detexit J. Fry" [lives at Bredasdorp. Discovered by J. Fry]
Remarks The number of specimens provided by John Fry from "Bredasdorp at the southern shore of Swellendam" was not noted in Benson's original description, but he included notes on the appearance of the live animal based on observations by Edgar Layard. Connolly (1912: 186) stated "Type in British Museum", an invalid lectotype designation because the specimen to which he was referring cannot be identified, and in any case none of the specimens in the NHM collection are syntypes.

Tomigerella layardi (Benson, 1856)

Pupa layardi Benson, 1856c: 435; 1864b: 496; Reeve and Sowerby, 1876 [in 1875–1878], 20 (*Pupa*): 15, species 141
Jaminia layardi (Benson); Connolly, 1912: 182
Fauxulus (*Tomigerella*) *layardi* (Benson); Connolly, 1939: 382
Type material UMZC I.102925.A, **Fig. 67 D** (damaged holotype from the R. McAndrew collection labelled "*Pupa* (*Torquilla*) *Layardi* Bens., Bens. col., Cape")
Original measurements: "Long. sp. imperfecti 7, diam. 4 mill." [later corrected to "Long. 8 mill." (Benson, 1864b: 496)]
Other material UMZC I.102925.B, **Fig. 67 E** (single shell provided by J.S. Hawkins in September 1862); NHMUK 1954.6.2.983–984 (two shells from the J.S. Hawkins collection labelled "*Pupa layardi* Benson, ?Paratypes, Cape Point, S. Africa")
Type locality South Africa: "ad Promontorii Bonae Spei extremitatem, "Cape Point" dictam" [at the tip of the Cape of Good Hope, called "Cape Point"]
Remarks Benson based his original description on a single, worn specimen but was aware of three: "Three specimens of this singular *Pupa* were found dead under a rock by Mr Layard. The specimen sent to me is much weathered, is deficient in the upper whorls, and is

slightly damaged on the columellar lip…". In a subsequent paper (Benson, 1864b) he noted "In the 'Annals' for December 1856, I described a Cape-Point *Pupa* as *P. layardi*, from an injured specimen received from Mr. E. Layard." Benson also acquired "another imperfect specimen from the same locality, but with the spire intact" from J. Sydney Hawkins in 1862 (Benson, 1864b: 496; see also correspondence Z MSS HAW, Hawkins to Benson, 12th Sept. 1862 and Benson to Hawkins, 1st Nov. 1862). This specimen allowed Benson to augment his original description of the nominal species (Benson, 1864b: 496) and to provide a brief description of a smaller form, *Pupa layardi* var. *minor* (see below).

Tomigerella layardi minor (Benson, 1864)

Pupa layardi var. *minor* Benson, 1864b: 496
Jaminia layardi var. *minor* Benson; Connolly, 1912: 182
Fauxulus layardi var. *minor* Benson; Connolly 1939: 383
Type material UMZC I.102920, **Fig. 67 F** (one of seven syntypes labelled "*Pupa* (*Torquilla*) *Layardi* Var., Cape G.H." [Cape of Good Hope])
Original measurements: "Long. 5½–7, lat. 2–3 mill."
Type locality South Africa: "Habitat ad Bredasdorp" [lives at Bredasdorp]
Remarks Although the name *minor* does not actually appear on the surviving labels, there is little doubt that the specimens in UMZC I.102920 are Benson's type series, since they conform with his dimensions and description of "Fresh specimens of a smaller variety from Bredastorp, sent to me by Mr. Layard, with a coloured epidermis, and in a perfect state". Connolly (1912: 183) listed "*F. layardi stoaphora* Bs" in the synonymy of this taxon, stating that the type of "*stoaphora*" is in BM(NH) (see also Pilsbry, 1917, xxiv, p. 245, Pl. xli (1918), Fig. 7–8).

Genus *Fauxulella* Pilsbry, 1917

Fauxulella pamphorodon (Benson, 1864)

Pupa pamphorodon Benson 1864b: 495; Reeve and Sowerby, 1876 [in 1875–1878], 20 (*Pupa*), pl. 13, species 120
Jaminia (*Fauxulus*) *pamphorodon* (Benson); Connolly, 1912: 187
Fauxulus (*Fauxulella*) *pamphorodon* (Benson); Connolly, 1939: 381; Schileyko, 2012: 143
Type material UMZC I.104980.A, **Fig. 68 C** (one of two syntypes from the R. McAndrew collection labelled "*Pupa* (*Orcula*) *pamphorodon* Bens., Bens. col., Cape")
Original measurements: "Long. 9, diam. 4 mill."
Other material NHMUK 1912.8.16.294, **Fig. 68 D** (one of three shells from the collection of Edgar Layard labelled "*P. pamphorodon* Bens., South Africa"); NHMUK 1954.6.2.962–965 (nine shells from the J.S. Hawkins collection labelled "*Pupa pamphorodon* Benson, Paratypes, Simon's Town, S. Africa")
Type locality South Africa: "Habitat prope Simonstown" [lives near Simonstown]
Remarks The number of specimens provided by Edgar Layard from "the ravine behind Admiralty House" was not noted in Benson's original description. Connolly (1912: 187) stated "Type in British Museum", an invalid lectotype designation since it is not clear to which specimen he was referring. Schileyko (2012: 143) provided anatomical information about this species, which is the type of *Fauxulella* Pilsbry, 1917. A recent molecular phylogenetic study of taxa previously assigned to the Orculidae (Harl et al., 2017) indicated that *F. pamphorodon* belongs to a distinct family (Fauxulidae Harl and Páll-Gergely, 2017).

Family GASTROCOPTIDAE

Subfamily GASTROCOPTINAE

Genus *Gastrocopta* Wollaston, 1878 [50]

Gastrocopta acarus (Benson, 1856)

Pupa acarus Benson, 1856c: 435
Gastrocopta acarus (Benson); Zilch, 1959: 160; Groh, 1983: 172, Fig. 12
Material a neotype (NHMUK 1912.8.16.370, **Fig. 68 E**) is hereby designated from a series of three shells from the E.L. Layard collection, labelled "*Pupa acarus* B., I. of St Vincents, Type spec. discovered by myself"). We have designated a neotype with the express purpose of clarifying the taxonomic status of *G. acarus* (see below).
Original measurements: "Long. 1¾, diam. ¾ mill."
Type locality Cape Verde Islands: "hab. ad insulam St Vincentii sub lapidibus" [lives on the island of St Vincent, under stones]
Remarks Benson described a single shell provided by Edgar Layard: "There is some indication of a fourth tooth, above, on the palate, in the only specimen received." An annotation in Benson's handwriting on Thomas Hutton's copy of Benson (1856c) states: "returned to Layard", suggesting that the holotype might be one of the three specimens from Layard's collection in the NHM. Given that Benson's holotype cannot be identified amongst the Layard specimens, we have therefore designated a neotype. This is the type species of *Gastrocopta* Wollaston, 1878 by subsequent designation (Pilsbry, 1916 [in 1916–1918]: 7).

Gastrocopta avanica (Benson, 1863)

Pupa avanica Benson, 1863c: 428; Pfeiffer, 1868 [in 1847–1877]: 335; Hanley and Theobald, 1876 [in 1870–1876]: 65, Pl. 160, Fig. 7; Reeve and Sowerby, 1876 [in 1875–1878], 20 (*Pupa*): Pl. 7, Fig. 60
Pupa (*Vertigo*) *avanica* Benson; Nevill, 1878: 197
Bifidaria avanica (Benson); Gude, 1914a: 292
Gastrocopta avanica (Benson); Pilsbry, 1916–1918: 138; Pokryszko et al., 2009: 433
Type material a neotype (NHMUK 1906.2.2.187, **Fig. 68 F**) is hereby designated from a series of six shells from the W.T. Blanford collection, four with a label stating "Ava" and two kept separately and labelled "Irrawady". All of the specimens are in a box labelled "*Pupa avanica* Bs, Kalamadoung, Ava, &c."). We have designated a neotype with the express purpose of clarifying the taxonomic status of *G. avanica* (see below).
Original measurements: "Long. 2½, diam. 1⅓ mill."
Other material NHMUK 20140903 (six shells from the H.F. Blanford collection labelled "*Pupa* (*Vertigo*) *Avanica* Bens, WTB [W.T. Blanford], Ava")
Type locality Burma: "Habitat in regione Avae. Detexit W.T. Blanford" [lives in the Ava Region. Discovered by W.T. Blanford]
Remarks The number of specimens provided by William Blanford was not noted in Benson's original description. None of the surviving material from the collections of the Blanford brothers can be directly linked to Benson, and there is no evidence that any of these specimens formed part of his type series. This species occurs in drier situations and at lower altitudes than *Gastrocopta huttoniana*, but on a similar wide range of substrates. Beyond its original localities in Burma, *G. avanica* is fairly widespread in the Himalayan foothill region of southern NW Frontier Province, with one site in Punjab Province (Pokryszko et al., 2009). It has also been recorded from Sabah, where it is widespread on islands (Phung et al., 2017).

Gastrocopta bathyodon (Benson, 1863)

Pupa bathyodon Benson, 1863c: 426; Pfeiffer, 1868 [in 1847–1877]: 326; Hanley and Theobald, 1874 [in 1870–1876]: 40, Pl. 100, Fig. 7; Reeve and Sowerby, 1876 [in 1875–1878], 20 (*Pupa*): pl. 4, species 33, pl. 16, species 152
Pupa (*Scopelophila*) *bathyodon* Benson; Nevill, 1878: 192
Bifidaria bathyodon (Benson); Gude, 1914a: 290
Gastrocopta bathyodon (Benson); Pilsbry, 1916–18: 136; Ramakrishna et al., 2010: 122; Raheem et al., 2014: 64
Type material NHMUK 19991573, **Fig. 69 C** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 64, Fig. 36F) from the A.S. Kennard collection labelled "cotype ex. Benson, Narbudda Ri."); UMZC I.104150 (three paralectotypes from the R. McAndrew collection labelled "*Pupa* (*Leiostyla*) *Bathyodon* Bens., Bens. col., Nerbudda R.")
Original measurements: "Alt. 3, diam. 2 mill."
Type locality India: "Habitat ad Teluk Sendur, prope Hoshungabad, non procul a flumine Nerbudda. Detexit W. Theobald, jun." [lives at Teluk Sendur, near Hoshungabad, not far from the Nerbudda River. Discovered by W. Theobald, junior]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. In India this species has been identified from Madhya Pradesh and Maharashtra (Ramakrishna et al., 2010).

Gastrocopta huttoniana (Benson, 1849)

Pupa huttoniana Benson, 1849c: 126; Pfeiffer, 1853 [in 1847–1877]: 550; Hanley and Theobald, 1874 [in 1870–1876]: 41, Pl. 101, Fig. 3
Pupa (*Vertigo*) *huttoniana* Benson; Nevill, 1878: 197
Bifidaria huttoniana (Benson); Gude, 1914a: 291
Gastrocopta huttoniana (Benson); Pilsbry, 1916–18: 137; Pokryszko et al., 2009: 433; Ramakrishna et al., 2010: 122; Raheem et al., 2014: 64, Fig. 37A–B; Budha et al., 2015: 11
Type material UMZC I.102345.B, **Fig. 69 A** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 64; Fig. 37A) from the R. McAndrew collection labelled "*Vertigo* (*Alea*) *Huttoniana* Bens. Bens col.", no locality data. Another label in Benson's handwriting reads "*Pupa Huttoniana*, Simla, Himalaya"); UMZC I.102345.A (paralectotype from the same lot)
Original measurements: "Long. 1 ½ mill., lat. vix 1 mill."
Type locality India: "Hab. rarissime ad Simla montibus sub-Himalayanis occidentalibus; Hutton" [lives very rarely at Simla, in the western sub-Himalayan mountains]
Remarks The number of specimens provided by Thomas Hutton was not noted in Benson's original description. This species seems to be the most widespread *Gastrocopta* in Pakistan, being found at numerous sites in FANA and the NW Frontier, Balochistan and Punjab provinces (Pokryszko et al., 2009). In India, it has been identified from the Western Ghats, Himachal Pradesh, Kashmir and Maharashtra (Ramakrishna et al., 2010; Raheem et al., 2014), in Nepal from the Annapurna Conservation Area (Kuznetsov and Schileyko, 1997) and it has recently been recorded from Bhutan (Gittenberger et al., 2017a).

Gastrocopta mimula (Benson, 1853)

Pupa mimula Benson, 1853c: 95; Pfeiffer, 1859 [in 1847–1877]: 676; Hanley and Theobald, 1876 [in 1870–1876]: 65, Pl. 160, Fig. 4; Reeve and Sowerby, 1876 [in 1875–1878], 20 (*Pupa*): Pl. 7, Fig. 61
Pupa (*Vertigo*) *mimula* Benson; Nevill, 1878: 198
Bifidaria mimula (Benson); Gude, 1914a: 292
Gastrocopta (*Gastrocopta*) *mimula* (Benson); Pilsbry, 1916–1918: 134
Type material UMZC I.104480.A, **Fig. 69 E** (one of five syntypes from the R. McAndrew collection labelled "*Pupilla Mimula* Bens., Bens. col., Ceylon")
Original measurements: "Long. 2, diam. 1 mill."
Other material NHMUK 1912.8.16.327–330, **Fig. 69 F** (one of four shells from the E.L. Layard collection labelled "Pt. Pedro, Ceylon")
Type locality Sri Lanka: "Hab. in vitibus ad Promontorium Pedronis" [Habitat: on grape vines at Point Pedro]
Remarks The number of specimens provided by Edgar Layard was not noted in the original description. However, Benson (1853c: 95) stated that the species "…was taken in abundance by Mr. Layard.", implying that there were several. Gude (1914a: 292–293) wrote: "I have seen four specimens in the British Museum, recently acquired by purchase, which are from Cape Pedro, and are accompanied by a label in the late Edgar Layard's handwriting; they are in all probability some of the original lot". However, although Layard collected the original shells, the specimens that Layard retained were not referred to by Benson in the original description and are not part of the type series. *Gastrocopta mimula* is considered endemic to Sri Lanka but it has recently been found on the Maldives, where it appears to be introduced (Gittenberger et al., 2019a).

Gastrocopta serrula (Benson, 1863)

Pupa serrula Benson, 1863c: 427; Pfeiffer, 1868 [in 1847–1877]: 319
Bifidaria serrula (Benson); Gude, 1914a: 293
Gastrocopta serrula (Benson); Pilsbry, 1916–1918: 135; Ramakrishna et al., 2010: 123
Type material UMZC I.104910, **Fig. 69 D** (holotype from the R. McAndrew collection labelled "*Pupa Serrula* Bens., Bens. col., Cent. Ind." [Central India])
Original measurements: "Long. 2, diam. ⅔ mill."
Type locality India: "Habitat in India centrali. Detexit W. Theobald" [Habitat: in central India. Discovered by W. Theobald]
Remarks Benson (1863c: 427) based his description on "A single derelict specimen" provided by Theobald. Gude (1914a: 293) wrote, "I have not seen any specimens; the type, like so many other of Benson's shells, having apparently gone astray. It appears to be a rare species." Gude apparently did not see UMZC I.104910, which is clearly the missing holotype.

Gastrocopta thibetica (Benson, 1864)

Pupa thibetica Benson, 1864a: 138
Gastrocopta ? *thibetica* (Benson); Pilsbry, 1916–1918: 138
Type material NHMUK 1857.3.11.25/1, **Fig. 69 B** (one of sixteen syntypes presented by Dr T. Thomson labelled "*Pupa Huttoniana* Benson, Iskardo, Tibet, Dr T. Thomson" with another label that states "*thibetica* Bs.")
Original measurements: "Long. 2, diam. 1 mill."
Type locality China: "ad Iskardo, Thibet. Detexit Dr Thomson" [at Iskardo, Tibet. Discovered by Dr Thomson]
Remarks A collection of shells from various localities in Kashmir and Tibet, assembled in 1847–48 by Dr Thomas Thomson during "one of the most adventurous journeys ever made in the Himalaya" (Thomson, 1852), was examined by Benson at the behest of S.P. Woodward (Woodward, 1856b) and subsequently presented to the BM by Thomson in 1857 (NHMUK 1857.3.11.1–26). Benson initially identified one lot of Thomson's shells from "Iskardo, Tibet" as *Pupa huttoniana* Benson (Woodward, 1856b: 186), but he later described the same specimens as *Pupa thibetica*: "This shell, received some years ago through Mr. Woodward of the British Museum, is nearly allied to *P. Huttoniana*, Bens., to which I erroneously referred it originally" (Benson, 1864a: 138). NHMUK 1857.3.11.25, registered as *Pupa huttoniana* in 1857 and subsequently labelled as *thibetica*, clearly represents the type series. Benson stated that *P. thibetica* possessed "two parietal plaits, one of which is remotely seated, and in some positions is not easily detected." Discovery of the type series, a specimen from which is figured here for the first time, allows confident attribution to *Gastrocopta*.

Subfamily HYPSELOSTOMATINAE

Genus *Angustopila* Jochum, Slapnik & Páll-Gergely, 2014 [51]

Angustopila milium (Benson, 1853) comb. nov.

Cyclostoma milium Benson 1853d: 285
Cyclophorus ? *milium* (Benson); Pfeiffer, 1854a: 84
Hydrocena milium (Benson); Benson, 1856e: 232; Pfeiffer, 1858: 158
?*Cyathopoma milium* (Benson); Blanford, 1869a: 178

?*Pupa plicidens* Benson juv.; Godwin-Austen, 1872: 515, Pl. 30, Fig. 3
Acmella milium (Benson); Theobald and Stoliczka, 1872: 333; Kobelt and Möllendorff, 1898: 153; Gude, 1921: 362; Ramakrishna et al., 2010: 111
Georissa milium (Benson); Pfeiffer, 1876: 292
Type material UMZC I.103805, **Fig. 70 A** (syntype from the R. McAndrew collection labelled "*Hydrocena milium* Bs., original shell described" (**Fig. 70 B**), no locality data)
Original measurements: "Long. 1¼, diam. vix. 1 mill."
Other material UMZC I.103800 (single shell from the R. McAndrew collection incorrectly labelled as this species; see below)
Type locality India: "in muscis arborum ad Musmai, prope Cherra-poonjee" [In moss on trees toward Musmai, near Cherra-poonjee]
Remarks The number of specimens examined was not noted in Benson's original description, although the label that accompanies UMZC I.103805 suggests that there was only one. UMZC I.103800 has a taller spire and a strongly keeled body-whorl, and clearly belongs to a completely different genus resembling *Cyathopoma*, which might account for Blanford's (1869a) attribution of Benson's species to that genus. Hanley and Theobald (1876 [in 1870–1876]: xiii) noted that "The type of the *H. milium* of Benson, figured by Godwin-Austen, is the fry of some larger shell, possibly of a *Pupa*." This species has been assigned to various operculate genera but it is clearly a pulmonate and belongs to the newly described hypselostomatid genus *Angustopila* Jochum, Slapnik & Páll-Gergely, 2014.

Genus *Bensonella* Pilsbry & Vanatta, 1900 [51]

Bensonella plicidens (Benson, 1849)

Pupa plicidens Benson, 1849c: 126; Pfeiffer, 1853 [in 1847–1877]: 553; Hanley and Theobald, 1874 [in 1870–1876]: 40, Pl. 100, Fig. 8; Reeve and Sowerby, 1876 [in 1875–1878], 20 (*Pupa*): pl. 16, species 151
Boysidia plicidens (Benson); Gude, 1914a: 294; Ramakrishna et al., 2010: 123
Bifidaria (*Bensonella*) *plicidens* (Benson); Pilsbry, 1915: 73
Boysidia (*Bensonella*) *plicidens* (Benson); Pilsbry 1916–1918: 198, pl. 34, figs 1–4, 9, 10
Bensonella plicidens (Benson); Pokryszko et al., 2009: 436
Type material UMZC I.102325.A, **Fig. 70 C** (one of 15 syntypes from the R. McAndrew collection labelled "*Pupa* (*Torquilla*) *Plicidens* Bens., Bens. col., Rockville, Landour, Himalayas"); NHMUK 1954.6.2.937 (syntype from the J.S. Hawkins collection labelled "*Pupa plicidens* Benson, Paratype, W. Himalayas, W.H. Benson 1861")
Original measurements: "Long. 2 mill., lat. 1 ½ mill."
Other material UMZC I.102330 (three shells from the R. McAndrew collection labelled "Landour, Himalayas", no collection data)
Type locality India: "Hab. ad Landour et Mussoorie, montibus Himalayanis" [Habitat: at Landour and Mussoorie, Himalayan Mountains]
Remarks Benson (1849c: 126) based his description on numerous specimens, which he collected from "a rock on which I found it abundantly one year…". One specimen of *Pupa plicidens* from "Himalaya" is in the Smithsonian Insititution (USNM 41196). From Benson specimens of *B. plicidens* from Landour in the collections of the Academy of Natural Sciences, Philadelphia, Pilsbry (1915) distinguished a rather smaller species that he named *Bifidaria* (*Bensonella*) *landurensis*. This was said to differ from *plicidens* in having an angular lamella that does not emerge quite to the edge of the peristome, and it is continuous, and not interrupted within. The parietal lamella is also less remote from the lip-edge, emerging nearly as far as the angular and the lower palatal plica is somewhat stronger. Pilsbry (1917) subsequently tranferred this species to the genus *Paraboysidia*. Budha and Backeljau (2017) have recently discussed this species and its relation to *B. plicidens*. They noted that the armature of some specimens of *Bensonella* from Landour had distinctive hooks but these were not present in any of the Benson specimens of *B. plicidens* in the UMZC. This confirms the observation of Hwang (2014), who figured a UMZC specimen of *B. plicidens* that lacked these hooks, but he also described a new subspecies *B. plicidens lakainguta* from Japan that had them. The taxonomic significance of these variations in dentition requires further work but the survival benefits of their possession in the protruding aperture of *B. plicidens* has recently been demonstrated experimentally (Wada and Chiba, 2013). *B. plicidens* is widely distributed in Asia and has been recorded from Bhutan (Gittenberger et al., 2017a) as well as China and Japan. Zhang et al. (2014) reviewed the occurrence of *Boysidia* in China, listing *B. plicidens* from central regions. This is the type species of *Bensonella* Pilsbry & Vanatta, 1900 by original designation. The family attribution requires confirmation.

Genus *Hypselostoma* Benson, 1856 [51]

Hypselostoma tubiferum (Benson, 1856)

Tanystoma tubiferum Benson, 1856h: 130
Hypselostoma tubiferum (Benson); Pfeiffer, 1860 [in 1854–1869], 1: 130, pl. 36, figs 1–4; Blanford, 1863a:

326; Hanley and Theobald, 1870 [in 1870–1876]: 4, Pl. 8, Fig. 3; Stoliczka, 1871: 173, Pl. 7, Fig. 1; Gude, 1914a: 298
Pupa (*Hypselostoma*) *tubifera* (Benson); Nevill, 1878: 193
Type material NHMUK 1954.6.2.568, **Fig. 70 D** (syntype from the J.S. Hawkins collection labelled "*Hypselostoma tubiferum* Bens., Paratype, Burmah, W.H. Benson Esq.", accompanied by a label in Benson's handwriting that reads "20, *Hypselostoma tubiferum* Bens., Burmah"); MCZH 47398 (two syntypes)
Original measurements: "Diam. major 4, min. 3, axis 2 mill."
Other material UMZC I.103015 (10 shells from the R. McAndrew collection labelled "*Hypsilostoma* [sic] *Tubiferum* (Blanford), Birmah", no collection data); NHMUK 1888.12.4.17–22 (six shells from the W. Theobald collection labelled "*Hypselostoma tubiferum* Benson, Tondoung/Thaiet Mio"); MCZH 47399 (eight shells from the W. Theobald collection)
Type locality Burma: "Habitat ad Thyet-Mio prope ripas fluminis Irawadi Burmanici, saxis calcareis adhaerens." [lives at Thyet-Mio, near the banks of the Irawadi river, Burma, clinging to calcareous rocks]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. Theobald (1857: 252) later noted that the species was very localised "at one spot on limestone rocks, near the Coal mines", but not uncommon. The original label associated with NHMUK 1954.6.2.568 corresponds with a numbered manuscript list that accompanied shells given to Hawkins by Benson in April 1862 [ZOO_MSS_HAW]. The UMZC specimens are not labelled as coming from the Benson collection, although this is their likely source, and are therefore excluded from the type series.

Genus *Clostophis* Benson, 1860

Clostophis sankeyi Benson, 1860

Clostophis sankeyi Benson, 1860e: 95; Pfeiffer, 1865: 12; Kobelt and Möllendorff, 1899: 138; Kobelt, 1902: 484, text-fig. 103; Gude, 1921: 350; Páll-Gergely et al., 2020c: 351
Type material UMZC I.103320, **Fig. 70 E** (holotype from the R. McAndrew collection labelled by Benson "*Clostophis Sankeyi* Ben., Moulmein")
Original measurements: "Diam. major 1½, alt. 1¾ mill."
Type locality Burma: "prope Moulmein, ad cavernas "Farm Caves" dictas" [near Moulmein, at the caves known as the 'Farm Caves']
Remarks Benson based his original description on a single weathered specimen: "I discovered this singular shell in the earth which filled the cavity of a decayed specimen of *Sophina schistostelis* collected by Major R.H. Sankey." This is the type species of *Clostophis* Benson, 1860 by monotypy. This is a pulmonate genus that has recently been transferred from Diplommatinidae to the gastrocoptid subfamily Hypselostomatinae (Páll-Gergely et al., 2020c).

Family LAURIIDAE [52]

Genus *Lauria* Gray, 1840

Lauria dadion (Benson, 1864)

Pupa dadion Benson, 1864b: 495
Jaminia dadion (Benson); Connolly, 1912: 179
Lauria dadion (Benson); Connolly, 1939: 399
Type material NHMUK 1912.8.16.373–375, **Fig. 70 F** (one of three syntypes from the E.L Layard colletion labelled "*Pupa dadion* Bs., Benson's types, South Africa"); UMZC I.104135 (two syntypes from the R. McAndrew collection labelled "*Pupa Dadion* Bens., Bens. col., Cape G.H." [Cape of Good Hope])
Original measurements: "Long. 3½, diam. 2 mill."
Other material NHMUK 1954.6.2.956–961 (13 shells from the J.S. Hawkins collection labelled "*Pupa dadion* Benson, Paratypes, Simonstown, Cape, South Africa, G.W. Browning 1859")
Type locality South Africa: "Habitat ad latus orientale montis "Table Mountain" dicti, necnon prope Simonstown" [lives on the eastern side of the mountain known as "Table Mountain", and also near Simonstown]
Remarks This species was discovered by Edgar Layard under moss on large stones at Paradise, a woodland high up the face of Table Mountain. Benson also mentioned that it also occurred in the ravine behind Admiralty House, Simonstown. The number of specimens examined was not noted in Benson's original description. Connolly (1912: 179) stated "Type in British Museum", an invalid lectotype designation since it is not clear to which specimen he was referring. This common species lives in leaf-litter and on tree trunks in mist-belt and montane *Podocarpus* forests in South Africa (Herbert and Kilburn, 2004). There are four other species of *Lauria* known from the Cape region but their taxonomic status has yet to be clarified.

Family PYRAMIDULIDAE

Genus *Pyramidula* Fitzinger, 1833

Pyramidula humilis (Benson, 1838)

Helix humilis Benson, 1838b: 217
Helix humilis (Hutton); Pfeiffer, 1847 [in 1847–1877]: 106; Reeve, 1851 [in 1851–1854], 7 (*Helix*): pl. 133, species 825; Hanley and Theobald, 1873 [in 1870–1876]: 28, Pl. 61, Figs 4–6
Helix (*Patula*) *humilis* Hutton; Nevill, 1878: 66
Helix (*Patula* (*Discus*)) *humilis*; Tryon, 1887: 22, pl. 3, figs 4–6
Pyramidula humilis (Benson); Pilsbry, 1893: 44; Gude, 1914a: 43; Ramakrishna et al., 2010: 126
Type material UMZC I.102010 (two syntypes from the R. McAndrew collection labelled "*Discus Humilis* Hutton, Bens. col.", no locality data, one of which (UMZC I.102010.A, **Fig. 70 G**) is here designated as the lectotype); NHMUK 1856.9.15.44 (32 syntypes from the T. Hutton collection labelled "*Helix humilis*, Simla & Myssorie, Cpt. Hutton"); NHMUK 1856.9.15.45 (four sinistral syntypes from the T. Hutton collection labelled "*Helix humilis* reversed, on a tree at Fagoo, near Simla"); NHMUK 1888.12.4.535–539 (five syntypes from the W. Theobald collection labelled "*H.* (*Vallonia*) *humilis* Hutton, (fide Benson) (Simla), 1 sinistral" with a label in Benson's handwriting stating "*Helix humilis* H.")
Original measurements: "Diam. 0.125" [poll.]
Other material UMZC I.105185 (from the R. McAndrew collection labelled "*Helix humilis*, Hills N. of Deyrah")
Type locality India: "Occurs at *Simla*, on moist rocks, on wet dead leaves, and at the roots of shrubs in the *khads*"
Remarks This species is often attributed to Hutton but the description is clearly marked with Benson's initial (B) in their joint paper (Hutton and Benson, 1838) and we consequently attribute sole authorship to Benson. The number of specimens examined was not recorded, but the species was described as being "very abundant during the rains". UMZC I.105185 is not labelled as part of the Benson collection, although this is likely. In a footnote to the original description Benson mentioned that "a reversed variety" [i.e. sinistral], otherwise resembling the dextral form [measuring "1½ lines"], occurred at Fágú in decayed trees, rather than amongst "rocks and dead leaves", which are the principal habitat of the dextral form; these shells form lot NHMUK 1856.9.15.45. Another sinistral shell survives amongst the five specimens from the Theobald collection (NHMUK 1888.12.4.535–539), which were identified by Benson himself. However, the sinistral specimens appear to be somewhat different to the other *humilis* specimens and probably represent a distinct species, although they remain part of the type series; for this reason we have designated a lectotype. In NW India, *Pyramidula humilis* has been recorded from Himachal Pradesh, Punjab and Uttarkhand (Ramakrishna et al., 2010) and there are recent records from Nepal (Budha et al., 2015). It has been suggested that *P. humilis* is conspecific with *P. rupestris* (Draparnaud, 1801), but since the latter taxon has recently been shown to subsume several cryptic species in western Europe (Gittenberger and Bank, 1996; Razkin et al., 2016a, b), this requires confirmation.

Family TRUNCATELLINIDAE [53]

Genus *Truncatellina* R.T. Lowe, 1852

Pupa rivierana Benson, 1854

Accepted as *Truncatellina callicratis* (Scacchi, 1833); *Turbo callicratis* Scacchi, 1833: 11

Pupa rivierana Benson, 1854a: 97
Truncatellina rivierana (Benson); Pilsbry, 1920–1921: 71, pl. viii, figs 10–12; Germain, 1930: 440, Fig. 403
Type material UMZC I.103860.A, **Fig. 71 A** (one of four syntypes from the R. McAndrew collection labelled by Benson "*P. Rivierana* B., Nice")
Original measurements: "Long. 2, diam. 2/3 mill."
Other material UMZC I.105010 (three shells from the R. McAndrew collection labelled "*Pupilla rivierana* Benson, Northern Italy", no collection data)
Type locality France: "Hab. in regione Riviera Pedemontana ad basin collium prope Nizza maritimam sub lapide" [lives in the region of the Piedmont Riviera, at the base of the hills near the coast of Nice, under stones]
Remarks *Pupa rivierana* is a junior synonym of *Truncatellina callicratis* (Scacchi, 1833), a species inhabiting dry grassy habitats, mostly in southern Europe (Kerney and Cameron, 1979: 68).

Truncatellina himalayana (Benson, 1863) [54]

Pupa himalayana Hutton MS in Benson, 1863c: 428; Hanley and Theobald, 1874 [in 1870–1876]: 41, Pl. 101, Fig. 4; Theobald, 1878: 146
Pupa (*Vertigo*) *himalayana* Hutton; Nevill, 1878: 197
Sphyradium himalayanum (Benson); Gude, 1914a: 41
Orcula (*Sphyradium*) *himalayanum* (Benson); Ramakrishna et al., 2010: 125
Truncatellina himalayana (Benson); Pokryszko et al., 2009: 429
Type material UMZC I.104385.A, **Fig. 71 B** (one of two syntypes from the R. McAndrew collection labelled "*P. Himalayana* Hutton, Bens. col.", no locality data); UMZC I.104395 (syntype from the R.

McAndrew collection labelled "*Vertigo himalayana* Hutton, Bens. col.", no locality data)
Original measurements: "Alt. 2, diam. 1 mill."
Other material UMZC I.104390 (22 shells from the R. McAndrew collection labelled "*Vertigo Himalayana* Bens", no locality or collection data); NHMUK 1856.9.15.73 (12 shells from the T. Hutton collection labelled "*Pupa himalayana* Benson, Simla and Mussoorie")
Type locality India: "Habitat in montibus Himalayanis occidentalibus, ad Simla et Musoorie. Detexit Capt. T. Hutton" [lives in the western Himalayan mountains, at Simla and Musoorie. Discovered by Capt. T. Hutton]
Remarks Benson (1863c: 428) remarked: "Capt. Hutton found three specimens near Waverley at Mussoorie". These are probably the three shells that form lots UMZC I.104385 and UMZC I.104395.
The other UMZC lot (I.104390) is not labelled as being from the Benson collection, although this is likely. This species occurs in a wide range of habitats, from dry and open situations to shady, moist settings on a variety of bedrock. It appears to be widespread in the NW Frontier and Balochistan provinces (Pokryszko et al., 2009).

Family VALLONIIDAE [55]

Genus *Pupisoma* Stoliczka, 1873

Pupisoma miccyla (Benson, 1860)

Helix miccyla Benson 1860b: 384; Hanley and Theobald, 1875 [in 1870–1876]: 52, Pl. 129, Figs 8, 9
Zonites (*Hyalinia* (*Conulus*)) *miccyla* (Benson); Tryon, 1886: 176, Pl. 53, Fig. 64
Pyramidula (*Pupisoma*) *miccyla* (Benson); Pilsbry, 1894 [in 1893–1895]: 52
Pupisoma miccyla (Benson); Godwin-Austen, 1910 [in 1897–1914]: 301, pl. 132, figs 1a–1d; Gude, 1914a: 38
Type material UMZC I.103315, **Fig. 71 C** (syntype from the R. McAndrew collection labelled "*Nanina Miccyla* Bens., Bens. col., Ceylon")
Original measurements: "Long. 1 ½, diam. 1 mill."
Type locality Sri Lanka: "ad Matelle" [at Matelle]
Remarks The number of specimens provided by Frederick Layard from "the bark of an orange tree near his house at Matelle" was not noted in Benson's original description. Unfortunately, UMZC I.103315 was lost while imaging it for this project.

Helix orcula Benson, 1850

Accepted as *Pupisoma dioscoricola* (C.B. Adams, 1845); *Helix dioscoricola* Adams, 1845: 16

Helix orcula Benson, 1850b: 251; Pfeiffer, 1853 [in 1853–1854], 1(12$_3$), 357: Pl. 136, Fig. 18; Reeve, 1853 [in 1851–1854], 7 (*Helix*): pl. 174, species 1176; Hanley and Theobald, 1874 [in 1870–1876]: 36, Pl. 87, Figs 1, 4
Pupa (*Pupisoma*) *orcula* (Benson); Nevill, 1878: 192
Zonites (*Hyalinia* (*Conulus*)) *orcula* (Benson); Tryon, 1887: 177, Pl. 53, Fig. 67
Pyramidula (*Pupisoma*) *orcula* (Benson); Pilsbry, 1894 [in 1883–1895]: 52
Pupisoma orcula (Benson); Godwin-Austen, 1910 [in 1897–1914]: 301; Gude, 1914a: 36; Ramakrishna et al., 2010: 124
Material UMZC I.103765.A, **Fig. 71 D** (one of over 30 shells from the R. McAndrew collection labelled "*Nanina Orcula* Bens.", no locality or collection data)
Original measurements: "Diam. 2, axis 2 mill."
Type locality India: "Hab. in agro Bengalensi et Baharico, necnon versus occidentem usque ad ripas fluvii Goomty." [lives in the country around Bengal and Bahar, and to the west as far as the banks of the River Goomty]
Remarks The number of specimens provided by Lieut. Burkinyoung from "a mango grove, distant a day's march from Jounpore, and on the road thence to Benares, creeping on the trunks of trees, during very heavy rain" was not noted in Benson's original description. The UMZC specimens are not labelled as coming from the Benson collection and we therefore cannot be sufficiently confident to recognise them unequivocally as syntypes. Benson mentioned another record from Dinapore, near Patna and noted that "it inhabits the mango groves on the whole route from Barrackpore, in Bengal, to the borders of Sikkim, and thence to Chuprah in Bahar." It also occurs in Africa and on many islands through the Indo-Pacific (e.g. Preece, 1995; Phung et al., 2017). *Helix orcula* was designated as the type of *Parazoogenetes* Habe, 1956. According to Hausdorf (2007) *Pupisoma orcula* should be considered a junior synonym of *P. dioscoricola* (C.B. Adams, 1845) on the basis of shell characters, unless future genetic studies demonstrate that Old World (*orcula*) and New World (*dioscoricola*) populations form separate units.

Family VERTIGINIDAE

Subfamily VERTIGININAE

Vertigo O.F. Müller, 1773

Vertigo diopsis (Benson, 1863) comb. nov.

Pupa diopsis Benson, 1863c: 427; Pfeiffer, 1868 [in 1847–1877]: 306; Hanley and Theobald, 1874 [in 1870–1876]: 41, Pl. 101, Fig. 10
Pupilla diopsis (Benson); Gude, 1914a: 284; Ramakrishna et al., 2010: 118

Type material NHMUK 1888.12.4.591, **Fig. 71 F** (holotype from the Theobald collection labelled "*Pupa diopsis* Benson (type), Narbadda Valley"
Original measurements: "Long. 2, diam. 1 mill."
Type locality India: "Habitat in valle Nerbuddae" [lives in the Nerbudda Valley]
Remarks Benson based his description on a single worn shell provided by William Theobald. Hanley and Theobald (1874: 41) remarked that Benson had noted that the name "*diopsis*" was a misprint for "*diploos*". Solem (1979: 18) thought that this species might be related to his *Pupilla afghanicum* but his figure of that species suggests attribution to *Truncatellina*. The specimen of *diopsis* has a smooth shell (although now worn), a minute swelling on the columellar and a small centrally-placed parietal tooth. There is no rib or constriction behind the aperture. These characters suggest that this species is neither a *Pupilla* nor a *Truncatellina* and it is here attributed to *Vertigo*.

Vertigo seriola (Benson, 1863) comb. nov.

Pupa seriola Benson, 1863c: 427; Pfeiffer, 1868 [in 1847–1877]: 304; Hanley and Theobald, 1874 [in 1870–1876]: 41, Pl. 101, Fig. 8
Pupisoma seriola (Benson): Godwin-Austen, 1910 [in 1897–1914]: 301
Pupilla seriola (Benson); Gude, 1914a: 284; Pilsbry, 1920–1921: 204; Ramakrishna et al., 2010: 125
Type material not located
Original measurements: "Long. 2½, diam. 1⅓ mill."
Other material NHMUK 20180579, **Fig. 71 E** (single broken shell from the H.F. Blanford collection, labelled "*Pupisoma seriola* Benson, Cuttack, Orissa, India"
Type locality India: "Habitat in regione Orissae (Cuttack). Detexit W. Theobald" [lives in the Orissa region (Cuttack). Discovered by W. Theobald]
Remarks Benson based his description on two shells provided by Theobald: "In one of the two specimens received, the parietal lamina is not apparent." Hanley and Theobald (1874 [in 1870–1876]) noted that the "type" had been smashed and it seems as if they prepared their figure from an imperfect photograph of it (Gude, 1914a: 38); they do not refer to the second syntype mentioned by Benson. Gude (1914a: 284) also included *Pupa seriola* under *Pupilla*, pointing out that Hanley and Theobald's figure (Pl. 101, Fig. 8) suggests that it is "allied to *P. eurina*, Benson". The NHM shell comes from the type locality but it cannot be linked to either Benson or Theobald and is not considered to be a type. It is, however, the only specimen that could be traced bearing the name *seriola*. It is badly damaged but this specimen is clearly neither a *Pupilla* nor a *Truncatellina* and, like *diopsis* (above), it is provisionally placed in *Vertigo*. This specimen, which lacks the apex, has moderately deep sutures and irregular oblique microsculpture. The palatal wall of the aperture is straight and nearly vertical, and slightly reflected. The dentition consists of a prominent central parietal tooth and a smaller tooth situated at the top of columellar lip.

Subfamily NESOPUPINAE

Genus *Insulipupa* Pilsbry and C.M. Cooke, 1920

Insulipupa brevicostis (Benson, 1849) comb. nov.

Pupa brevicostis Benson, 1849c: 127
Pupa (*Vertigo*) *brevicostis* Benson; Nevill, 1878: 197
Pupa indica Pfeiffer, 1855a: 295 (non Benson Mss in Hutton, 1849)
Pupilla barrackporensis Gude, 1914a: 285
Type material UMZC I.102320.A, **Fig. 71 G** (one of three syntypes from the R. McAndrew collection labelled "*brevicostis*, Barrackpore, Bengal", with another label in Benson's handwriting (**Fig. 71 H**) that reads "*Pupa brevicostis* B. Barrackpore, Bengal")
Original measurements: "Long. 1½ mill., lat. vix 1 mill."
Other material UMZC I.102315 (four shells from the R. McAndrew collection labelled "*brevicostis*, Bengal"); NHMUK 20190688 (six shells from the H. Cuming collection labelled "*Pupa indica* Pfr., Barrackpore, M.C.")
Type locality India: "Hab. ad Barrackpore, Bengal" [lives at Barrackpore, Bengal]
Remarks The number of specimens provided by Dr J.F. Bacon from "the trunk of a tamarind tree at the Cantonment of Barrackpore, near Calcutta, during the rainy season of 1848" was not noted in Benson's original description. Bacon supplied these to Benson "by letter in a quill", two of which arrived alive, allowing him to describe them in more detail. Nevill (1878: 197) listed a lot of 12 specimens in the Indian Museum labelled "Barrackpore (typical); coll. Dr Bacon (As. Soc., Bengal)". Gude (1914a: 288) noted that Küster's (1852: Pl. 17, Figs 20-22) figures of *brevicostis* were not very good representations of the shell, and because the type series could not be located in Cambridge he illustrated a specimen from the Cuming collection in the BM(NH) measuring 1.75 x 1.1 mm (Gude, 1914a: Fig. 104). It is not clear why Gude assumed that this specimen, characterized by "lamellate striae and the short spire as compared with the diameter" was *brevicostis*, given that he had also examined the specimens labelled *brevicostis* by Benson in the UMZC. Indeed, according to Gude (1914a: 285) these specimens in the McAndrew collection (ex Benson coll.) are *Pupilla barrackporensis*, a name he proposed to replace *Pupa indica* L. Pfeiffer, 1855, which he thought was a junior homonym of *Pupa*

indica Benson. However, the latter is a manuscript name mentioned by Hutton (1846, 1849) that was never made available. We consider that the three shells in lot UMZC I.102320, associated with an original Benson label, are syntypes and are conspecific with those that form the type series of *Pupa indica* Pfeiffer, 1855 (NHMUK 20190688). We therefore agree with the synonymy previously suggested by Nevill (1878: 197) and reinterpret Gude's (1914a: 286) concept of *Pupa brevicostis*. According to Gittenberger and van Bruggen (2013) *Pupilla barrackporensis* Gude, 1914 is a junior synonym of *Insulipupa malayana* (Issel, 1874), both of which are therefore junior synonyms of *I. brevicostis* (Benson, 1849).

Infraorder CLAUSILIOIDEI

Superfamily CLAUSILIOIDEA

Family CLAUSILIIDAE

Subfamily PHAEDUSINAE

Tribe PHAEDUSINI

Genus *Phaedusa* H. Adams & A. Adams, 1855

Subgenus *Phaedusa* H. Adams & A. Adams, 1855

***Phaedusa* (*Phaedusa*) *ceylanica* (Benson, 1863)**

Clausilia ceylanica Benson, 1863a: 89; Pfeiffer, 1868: [in 1847–1877]: 427; Hanley and Theobald, 1874 [in 1870–1876]: 48, Pl. 118, Fig. 1
Clausilia (? *Medora*) *ceylanica* Benson; Blanford, 1872: 201, Pl. 9, Fig. 4
Clausilia (*Phaedusa*) *ceylanica* Benson; Nevill, 1878: 184; Gude, 1914a: 309
Phaedusa ceylanica (Benson); Naggs and Raheem, 2000: Fig. 30; Nordsieck, 2002: 88
Material a neotype (NHMUK 1954.6.2.1062, **Fig. 72 A**) is here designated from a lot of two shells from the J.S. Hawkins collection labelled "*Clausilia ceylanica* Benson, Paratypes, Fort McDonald, Central Mountains, Ceylon, Alt. 4500ft., F. Layard". We have designated a neotype with the express purpose of clarifying the taxonomic status of *Phaedusa* (*Phaedusa*) *ceylanica* (see below).
Other material NHMUK 1954.6.2.1063 (second shell from the neotype lot); UMZC I.103285 (four shells labelled "*Clausilia Ceylanica* Benson, Ceylon", no collection data)
Original measurements: "Long. 12, diam. 2½ mill.; apert. long. 3, lat. 2 mill."
Type locality Sri Lanka: "prope Fort McDonald" [near Fort McDonald]
Remarks The number of specimens "found by Mr F. Layard at an altitude of 4500 feet on the central mountain mass of the Island of Ceylon" was not noted in Benson's original description. The UMZC shells are not labelled as coming from the Benson collection, and the species is not listed in McAndrew's manuscript *Catalogue*. There is therefore insufficient evidence to accept them as syntypes. The NHM specimens were apparently given to J.S. Hawkins by Frederick Layard, with whom he corresponded and exchanged shells throughout the 1860s (see letters, ZOO_MSS_HAW). Despite the label stating that these are "Paratypes", Hawkins did not indicate that the specimens were acquired from Benson, and the species is not included in Benson's manuscript lists of shells he sent to Hawkins, excluding them from the type series. *Phaedusa ceylanica* is unrecorded outside Sri Lanka and, within Sri Lanka, has not been found in surveys of natural habitats. None were found in the vicinity of where Fort McDonald was located but they were observed attached to the trunks of large exotic trees in Hakgala Botanic Gardens in the Nuwara Eliya District, leading to speculation that this member of a primarily Himalayan group is an introduced species (Naggs and Raheem, 2005).

Genus *Euphaedusa* Boettger, 1877

***Euphaedusa aculus* (Benson, 1842)** [56]

Clausilia aculus Benson, 1842b: 487, 1855a: 123; Küster, 1844 [in 1844–1862]: 19, Taf. 1, figs 25–27; Heude, 1882 [in 1882–1890]: 68, Pl. XVIII, Fig. 8
Euphaedusa aculus (Benson); Boettger, 1877: 59
Clausilia (*Phaedusa*) *aculus* Benson; Nevill, 1878: 185
Type material OUMNH.ZC.MO25557 (four syntypes from the T. Cantor collection labelled "*Clausilia aculus*, 3", one of which (OUMNH.ZC.MO25557-01, **Fig. 72 B**, the only bidentate specimen) is hereby designated as the lectotype); UMZC I.104085 (five syntypes from the R. McAndrew collection labelled "*Clausilia* (*Phaedusa*) *Aculus* Bens., Bens. col., Chusan". Four are tridentate shells and the fifth has been badly degraded by Bynesian decay); NHMUK 1842.9.30.14–17 (four syntypes, all tridentate shells, presented by the Hon. East India Company and registered as "Clausilia aculus Cantor, in earth, stones, trees &c., Island of Chusan", with subsequent labels that state "?tau Bttg., [Japan]")
Original measurements: "Axis longioris 0.65, minoris 0.5 poll."
Type locality China: Chusan. "In the earth, on mossy stones, walls and trees"
Remarks The number of specimens provided by Theodore Cantor was not recorded in Benson's brief original description, but there were clearly several. In his expanded account of the material from Chusan,

which included Cantor's observation that this species "appeared in great numbers in rainy weather", Benson subsequently noted that the type series consisted of two sizes of shell, the majority being the "dwarf kind" that varied in the presence or absence of a third tooth. There were only two specimens of the larger shell (Benson, 1855a: 123). Nevill (1878: 185) listed two syntypes in the collection of the Indian Museum labelled "Chusan (typical); coll. Dr Cantor ex c. As. Soc. Bengal" and mentioned two further shells in that collection, listed as "? *C. aculus* var." under the entry for *Clausilia fortunei* L. Pfeiffer, noting "These are the two specimens of the larger variety mentioned by Benson…". All of the specimens in Cambridge, London and Oxford represent the smaller form. The variable dentition noted in Benson's original description ("apertura dentibus duobus vel tribus munita" [mouth protected by two or three teeth]) is of critical importance. The bidentate form has long been considered to be Benson's *aculus* (e.g. Küster, 1844), while those with three teeth have generally been referred to *Tauphaedusa tau* (Boettger, 1877); see, for example, Heude (1882 [in 1882–1890]: 68), who described and figured both species (*C. aculus*, Pl. XVIII, Fig. 8; *C. tau*, Pl. XXXI, Fig. 15) and also Nordsieck (2001, 2007). The type material listed above consists of specimens representing both taxa and, in order to maintain current usage, we have designated the only well preserved bidentate example (OUMNH.ZC.MO25557-01) as the lectotype.

Genus *Hemiphaedusa* O. Boettger, 1877

Subgenus *Hemiphaedusa* O. Boettger, 1877

Hemiphaedusa (*Hemiphaedusa*) *pluviatilis pluviatilis* (Benson, 1842) [56]

Clausilia pluviatilis Benson, 1842b: 486
Clausilia (*Phaedusa*) *pluviatilis* Benson; Nevill, 1878: 185
Hemiphaedusa pluviatilis (Benson); Nordsieck, 2001: 47
Type material OUMNH.ZC.MO25556, **Fig. 72 C** (syntype from the T. Cantor collection labelled "2. *Clausilia pluviatilis*"); NHMUK 1842.9.30.21–22 (two syntypes (one adult and one juvenile) presented by the Hon. East India Company labelled "*Clausilia pluviatilis* Cantor, in the earth, Island of Chusan")
Original measurements: "Axis 1.1 poll."
Other material UMZC I.104555 (four shells from the R. McAndrew collection labelled "*Clausilia pluviatilis* Bens", no locality or collection data); NHMUK 1996002 (single shell from the H. Cuming collection labelled "*Clausilia pluviatilis* Benson in Cantor, Chusan")
Type locality China: Chusan. "Habitat. In the earth"
Remarks Benson (1842b) did not state the number of specimens seen at the time of his original description but he later wrote that this species was only observed after heavy and protracted rain and that Cantor found three specimens lying on the ground and a further eight were found by digging in the wet earth, where they were associated with *Clausilia aculus* (Benson, 1855: 123). This species is the type of *Hemiphaedusa* O. Boettger, 1877 by subsequent designation (Kennard and Woodward, 1923: 305).

Genus *Cylindrophaedusa* O. Boettger, 1877

Subgenus *Montiphaedusa* H. Nordsieck, 2002 [57]

Cylindrophaedusa (*Montiphaedusa*) *ios ios* (Benson, 1852) [56]

Clausilia Iös Benson, 1852b: 350; Hanley and Theobald, 1870 [in 1870–1876]: 12, Pl. 24, Fig. 10
Clausilia jös Benson; Pfeiffer, 1853 [in 1847–1877]: 612
Clausilia (? *Medora*) *iös* Benson; Blanford, 1872: 200, Pl. 9, Fig. 2
Clausilia jos Benson; Reeve and Sowerby, 1875 [in 1875–1878], 20 (*Clausilia*): Pl. 8, Fig. 75
Clausilia (*Phaedusa*) *jos* Benson; Nevill, 1878: 184
Clausilia Joes Benson; Boettger, 1878: 38
Clausilia (*Phaedusa*) *ios* Benson; Gude, 1914a: 308
Hemiphaedusa ioes ioes (Benson); Nordsieck, 1973: 71
Euphaedusa ios (Benson); Ramakrishna et al., 2010: 142
Cylindrophaedusa (*Montiphaedusa*) *ioes* (Benson); Nordsieck, 2002: 94
Type material UMZC I.103825, **Fig. 72 D** (one of three syntypes from the R. McAndrew collection labelled "*Clausilia Ios* Bens., Bens. col., Darjiling")
Original measurements: "Long. 13, diam. 3 mill. Apert. long. 3, lat. 2 mill."
Type locality India: "ad Darjiling. Teste R. Trotter" [lives at Darjiling according to R. Trotter]
Remarks The number of specimens provided by Robert Trotter was not noted in Benson's original description. He had mentioned receiving them in an earlier paper (Benson, 1852c: 272), in which he also made some observations about the distribution of Indian clausiliids. This is the type species of the subgenus *Montiphaedusa* H. Nordsieck, 2002 and is found in North Pakistan, Nepal, Northeast India, Burma and Bhutan (Nordsieck, 2002; Budha et al., 2015). Benson's species name *Iös* was amended to *Joes* by Boettger (1878) and *ioes* by Nordsieck (1973). However, ICZN article 32.5.2 only allows the removal of diacritical marks in this manner for names based on German words, which is not the case in this instance. The correct spelling of the name is therefore *ios*.

Genus *Oospira* W.T. Blanford, 1872

Subgenus *Oospira* W.T. Blanford, 1872

Oospira (*Oospira*) *bulbus* (Benson, 1863)

Clausilia bulbus Benson, 1863b: 321; Pfeiffer, 1868 [in 1847–1877]: 409; Hanley and Theobald, 1870 [in 1870–1876]: 12, Pl. 24, Fig. 5; Reeve and Sowerby, 1875 [in 1875–1878], 20 (*Clausilia*): Pl. 6, Fig. 51
Clausilia (*Oospira*) *bulbus* (Benson); Blanford, 1872: 206, Pl. 9, Fig. 16; Gude, 1914a: 332
Oospira bulbus (Benson); Nordsieck, 2002: 86
Type material UMZC I.103230, **Fig. 72 E** (syntype from the R. McAndrew collection labelled "*Clausilia* (*Phaedusa*) *Bulbus* Bens., Bens. col., Moulmein"; a more recent label in the hand of Martin Bishop reads "*Phaedusa bulbus* (Benson)")
Original measurements: "Diam. anfract. antepenultimi 9, ultimi supra aperturam 5, axis 23 mill.; apert. (oblique) longa 8, lata 7 mill."
Type locality Burma: "Habitat ad ripas fluvii Attaran, non procul ab urbe Moulmein" [Habitat: toward the banks of the River Attaran, not far from the town of Moulmein]
Remarks The number of specimens provided by Col. Robert Gordon was not noted in Benson's original description, although Blanford (1872: 206) later noted that "The figure in the *Conchologia Indica* is, I believe, taken from Mr. Benson's original specimen", suggesting that there was only one.

Oospira (*Oospira*) *loxostoma* (Benson, 1836)

Clausilia loxostoma Benson, 1836a: 353; Pfeiffer, 1848 [in 1847–1877]: 404; Hanley and Theobald, 1870 [in 1870–1876]: 12, Pl. 24, Fig. 7; Gude, 1914a: 324
Clausilia (*Phaedusa*) *loxostoma* Benson; Blanford, 1872: 201, Pl. 9, Fig. 6; Nevill, 1878: 184
Oospira loxostoma (Benson); Nordsieck, 2002: 86; Ramakrishna et al., 2010: 145
Type Material UMZC I.102030 (three syntypes from the R. McAndrew collection labelled "*Clausilia Loxostoma* Bens., Bens. col.", no locality data, one of which (UMZC I.102030.A, **Fig. 72 F**) is here designated as the lectotype)
Original measurements: "Long. 0.85 poll."
Other material NHMUK 1841.7.23.13 (specimen presented by Dr Thomas Horsfield labelled "*Clausilia loxostoma*, n 39, Himalaya"); NHMUK 1907.12.30.216 (single specimen from the H. Harvey collection labelled "*Clausilia loxostoma* Bens., Figd in Conch. Indica pl. 24, f. 7, from Hanley Coll., Teria Ghat"); NHMUK 1888.12.4.1026–1026 (three specimens from the W. Theobald collection labelled "*Clausilia loxostoma* Benson, Teria Ghat")
Type locality India/Bangladesh: part of a collection "chiefly made in the hills on the N.E. Frontier of Bengal".
Remarks The number of specimens examined was not noted in Benson's original description, which was based on material in the Museum of the Asiatic Society acquired from an expedition to "Sylhet, Cherra Poonji and the Khasi Hills" (Pearson, 1833). Benson (1852b) later mentioned that the type specimens were "obtained from the Khasya Hills to the south-east of the river Burhampooter". NHMUK 1841.7.23.13 was presented to the BM by Dr Thomas Horsfield, curator of the India Museum, amongst a batch of specimens transferred from the Asiatic Society. It is labelled "n 39", corresponding to the entry in the published list of transferred specimens (Pearson, 1840), but it is clearly not *loxostoma* and cannot therefore be a syntype. Nevill (1878: 184) listed six further shells from "North-East Bengal (types); ex. C. As. Soc., Bengal" in the Indian Museum, which might represent type material. Blanford (1872: 202) stated that the usual locality cited for this species (i.e. Bengal) conveys a false impression, as neither this nor any other clausiliid occurs in the plains of India. Teria Ghat, the locality mentioned by Hanley and Theobald (1870 [in 1870–1876]), is at the southern base of the Khasi Hills, where it occurs at many places and at a variety of altitudes.

CLAUSILIIDAE INCERTAE SEDIS

Clausilia stylus Benson, 1849

Clausilia stylus Benson, 1849b: 166
Type material not located
Type locality Malaysia: "Malacca"
Remarks This name was made available by Benson (1849b: 166), who contrasted specimens he had "described in MS as *C. stylus*" from Malacca with *Clausilia insignis* Gould, 1843. He had also examined specimens from Java in the Cuming collection labelled as *C. chinensis*, which he thought were conspecific. A single specimen in the McAndrew collection in the UMZC is labelled "*Clausilia* (*Phaedusa*) *chinensis* Pfr., Bens. Col., China".

Infraorder ARIONOIDEI

Superfamily ARIONOIDEA

Family PHILOMYCIDAE

Genus *Meghimatium* van Hasselt, 1823 [58]

Meghimatium bilineatum (Benson, 1842)

Incilaria bilineata Benson, 1842b: 486
Philomycus bilineatus (Benson); Nevill, 1878: 65

Tebennophorus (*Meghimatium*) *bilineatus* (Benson); Tryon, 1885: 229, Pl. 56, Fig. 5
Meghimatium bilineatum (Benson); Wiktor et al., 2000
Type material not located
Original measurements: "Long. ad poll 1½."
Type locality China: Chusan. "Habitat. The earth, under roots, on trees and plants."
Remarks The number of specimens examined was not noted in Benson's original description, but he subsequently reported that "Great numbers were seen at night above ground on plants and trees, also on rainy days, when they appear suddenly" (Benson, 1855: 121). This species was listed (as *Limax bilineata*) amongst the specimens from Chusan dispatched to the "Hon. Court of Directors" [of the East India Company] by Cantor in February 1842. This would have been syntype material, as presumably would the specimen sent by Cantor to the Indian Museum listed by Nevill (1878: 65). *Incilaria bilineata* is the type species of *Incilaria* Benson, 1842. The name *Incilaria bilineata* has been used quite extensively for a species that occurs in Japan, Taiwan and China (Keferstein, 1866; Azuma, 1995). Wiktor et al. (2000) treated *Incilaria* Benson, 1842 as a junior synonym of *Meghimatium* van Hasselt, 1823. *Meghimatium bilineatum* was included in the molecular phylogeny of pulmonates published by Wade et al. (2006). Cantor also named a species of spider, *Latrodectus limacida* Cantor, 1842, due to it being observed to seize *Incilaria bilineata*.

Infraorder LIMACOIDEI

["LIMACOID CLADE"]

Superfamily GASTRODONTOIDEA

Family OXYCHILIDAE

Subfamily OXYCHILINAE

Genus *Oxychilus* Fitzinger, 1833

Subgenus *Ortizius* Forcart, 1957

Helix remota Benson, 1851

Accepted as *Oxychilus* (*Ortizius*) *alliarius* (J.S. Miller, 1822); *Helix alliaria* Miller, 1822: 379

Helix remota Benson, 1851a: 263; Reeve, 1853 [in 1851–1854], 7 (*Helix*): pl. 173, species 1168
Hyalinia alliaria (Miller, 1822); Wollaston, 1878: 535
Oxychilus alliarius (Miller); Crowley and Pain, 1977: 565
Type material NHMUK 1912.8.16.362–364, **Fig. 73 A** (one of three syntypes (one of which has been lost) from the Edgar Layard collection labelled "*Hyalinia remota* Bens, St Helena, types", with another label that reads "No. 3. On the side of the road, under stones, leading to long wood. Looking down on the grave")
Original measurements: "Diam. major 7, minor 5½, axis 2¼ mill."
Type locality St Helena: "Hab. in insula St Helenae in locis elevatis" [Habitat: in elevated localities in the island of St Helena]
Remarks Benson noted that in 1832 he "took three specimens under moist stones, between Plantation House and Stitch's ridge, as well as in the mountain valley which then contained the Tomb of Napoleon". The absence of specimens labelled *remota* in the UMZC, and the close match between Benson's description of his discovery of this species and the label accompanying the specimens from Layard's collection (including the word "types"), suggests that these are the type series. We therefore regard them as syntypes.

Superfamily TROCHOMORPHOIDEA

Family TROCHOMORPHIDAE

Genus *Trochomorpha* Albers, 1850

Trochomorpha ceryx (Benson, 1859)

Helix ceryx Benson, 1859e: 184
Helix (*Trochomorpha*) *caryx* [sic] Benson; Tryon, 1887: 75
Trochomorpha ceryx (Benson); Pilsbry, 1893: 4; Gude, 1914a: 4
Type material not located
Original measurements: "Diam. major 6, minor 5, axis 5 mill."
Type locality Burma: "Hab. ad Phie Than, vallis Tenasserim, raro occurrens. Teste W. Theobald" [lives at Phie Than, Tenasserim valley, occurs rarely according to W. Theobald]
Remarks Benson based his original description on a shell provided by William Theobald: "The single specimen sent for inspection is injured in the right lip". Theobald (1857: 250) had previously listed Benson's manuscript name but did not provide a description. The holotype could not be located.

Genus *Geotrochus* Hasselt, 1823

Geotrochus lychnia (Benson, 1852)

Helix lychnia Benson, 1852b: 349; Reeve, 1853 [in 1851–1854], 7 (*Helix*): pl. 172, species 1161
Helix (*Sivella*) *lychnia* Benson; Blanford, 1863b: 86
Nanina (*Trochonanina*) *lychnia* (Benson); Tryon, 1886: 50, Pl. 24, Fig. 79
Eurybasis lychnia (Benson); Maassen, 2001: 98
Geotrochus lychnia (Benson); Tan, 2012: 108

Type material UMZC I.104450.A, **Fig. 73 B** (one of four syntypes from the R. McAndrew collection labelled "*Trochomorpha Lychnia* Bens., Bens. col., Singapore")
Original measurements: "Diam. major vix 21, minor 11, axis 5½ mill."
Type locality Singapore: "Hab. in Insula Sincapore. Teste Dr. J.F. Bacon" [lives on the Island of Singapore, according to Dr J.F. Bacon]
Remarks The number of specimens provided by Bacon was not noted in Benson's original description, although he noted "it does not appear to be scarce."

Genus *Videna* H. Adams & A. Adams, 1855

Videna cantoriana (Benson, 1861)

Helix cantoriana Benson, 1861d: 85
Trochomorpha cantoriana (Benson); Stoliczka, 1873: 22, Pl. I, Fig. 13; Nevill, 1878: 56
Helix (*Patula* (*Videna*)) *cantoriana* Benson; Tryon, 1887: 83, pl. 16, figs 87–89
Videna cantoriana (Benson); Maassen, 2001: 115
Type material UMZC I.104260, **Fig. 73 C** (holotype from the R. McAndrew collection labelled "*Zonites* (*Videna*) *Cantoriana* Bens., Bens. col., Pulo Sung Sung")
Original measurements: "Diam. major 10, minor 9, axis 3½ mill."
Type locality Malaysia: "Habitat in insula Pulo Sung-Sung, prope Pulo Pinang. Detexit Dr J.E. [sic] Cantor" [lives on the Island of Pulo Sung-Sung, near Pulo Pinang. Discovered by Dr T.E. Cantor]
Remarks Benson based his original description on a single specimen provided by Theodore Cantor.

Videna sanis (Benson, 1861)

Helix sanis Benson, 1861d: 84; Hanley and Theobald, 1874 [in 1870–1876]: 35, Pl. 83, Figs 4, 7
Trochomorpha sanis (Benson); Nevill, 1878: 56
Helix (*Trochomorpha*) *sanis* Benson; Tryon, 1887: 84, pl. 16, figs 3, 4
Discus sanis (Benson); Godwin-Austen, 1895a: 442
Trochomorpha (*Videna*) *sanis* (Benson); Gude, 1914a: 8
Videna sanis (Benson); Ramakrishna et al., 2010: 319; Rao et al., 2013: 141
Type material UMZC I.103140.A, **Fig. 73 D** (one of two syntypes from the R. McAndrew collection labelled "*Videna Sanis* Bens., Bens. col., Andeman I.")
Original measurements: "major 11, minor 10, axis 3.5 mm"
Other material UMZC I.103140.C (larger shell from the type lot); NHMUK 1888.12.4.1580–1583 (four shells from the W. Theobald collection labelled "*H* (*Trochomorpha*) *sanis* Benson, (typical), Andamans")
Type locality Andaman Islands: "Habitat ad Portum Blair Andamanicum" [lives at Port Blair, Andaman Islands]
Remarks Benson based his original description on two shells provided by Dr Walker and Captain Haughton. One of the UMZC shells (UMZC I.103140.C) is significantly larger than the original measurements provided by Benson and is therefore excluded from the type series. The other two specimens (UMZC I.103140.A–B) match the original measurements and we therefore identify these as Benson's syntypes. This species is endemic to the Andaman Islands (Rao et al., 2013).

Family CHRONIDAE

Genus *Kaliella* W.T. Blanford, 1863

Kaliella bullula (Benson, 1838)

Helix bullula Benson, 1838b: 218
Helix bullula Hutton; Pfeiffer, 1848 [in 1847–1877]: 86; Hanley and Theobald, 1873 [in 1870–1876]: 28, Pl. 61, Figs 2, 3
Nanina (*Microcystis*) *bullula* (Hutton); Nevill, 1878: 37
Nanina (*Kaliella*) *bullula* (Hutton); Tryon, 1886: 64, Pl. 27, Fig. 79
Kaliella bullula (Hutton); Godwin-Austen, 1882 [in 1882–1888]: 23, pl. 5, figs 4, 5; Blanford and Godwin-Austen, 1908: 267
Type material UMZC I.102005.A, **Fig. 73 E** (one of nine syntypes from the R. McAndrew collection labelled "*Discus Bullula* Hutton, Bens. col., Landour"); NHMUK 1856.9.15.50 (eight syntypes from the T. Hutton collection labelled "Simla and Mussorie")
Original measurements: "Diam. 015." [poll.]
Type locality India: "among dead leaves at *Simla*" [found with *H. fastigiata*]
Remarks This species is often attributed to Hutton (or to Hutton & Benson) but Benson's initial (B) follows the relevant section of their joint paper (Hutton and Benson, 1838), so we consequently attribute sole authorship to Benson. The shell described by Pfeiffer (1848: 86) was not *bullula* but *nana* (Blanford and Godwin-Austen, 1908: 267).

Kaliella nana (Benson, 1838)

Helix nana Benson, 1838b: 218
Helix nana Hutton; Pfeiffer, 1848 [in 1847–1877]: 31; Hanley and Theobald, 1873 [in 1870–1876]: 28, Pl. 61, Figs 7, 8, 9
Nanina (*Microcystis*) *nana* (Hutton); Nevill, 1878: 38
Nanina (*Kaliella*) *nana* (Hutton); Tryon, 1886: 64, Pl. 27, Fig. 76

Kaliella ? *nana* (Hutton); Godwin-Austen, 1882 [in 1882–1888]: 21, Pl. 5, Fig. 6, 1888: 47; Blanford and Godwin-Austen, 1908: 266; Ramakrishna et al., 2010: 228

Type material NHMUK 1856.9.15.41 (seven syntypes from the T. Hutton collection labelled "*Helix nana* Hutton, Simla and Mussoorie")

Original measurements: "Diam. 0.1" [poll.]

Other material UMZC I.102060.A, **Fig. 73 F** (one of over 30 shells from the R. McAndrew collection labelled "*nana* Hutt.", no collection or locality data)

Type locality India: Simla [found with *H. fastigiata* and *H. bullula*]

Remarks This species is often attributed to Hutton (or to Hutton & Benson) but Benson's initial (B) follows the relevant section of their joint paper (Hutton and Benson, 1838) and we consequently attribute sole authorship to Benson. The Cambridge material is not labelled as coming from the Benson collection, although this is the likely source.

Family DYAKIIDAE

Genus *Dyakia* Godwin-Austen, 1891

Dyakia regalis (Benson, 1850)

Helix regalis Benson, 1850a: 215; Reeve, 1852 [1851–1854], 7 (*Helix*): pl. 96, species 526; Pfeiffer, 1853 [in 1853–1854], 1(12_3), 377: pl. 141, figs 5–8

Nanina (*Ariophanta) regalis* (Benson); Nevill, 1878: 20; Tryon, 1886: 19, pl. 2, figs 30, 31

Dyakia regalis (Benson); Hausdorf, 1995: 361

Material UMZC I.104710.A, **Fig. 74 A** (one of five shells from the R. McAndrew collection labelled "*Helix regalis* Benson, Borneo", no collection data); UMZC I.104715 (two shells from the R. McAndrew collection labelled "*Nanina Regalis* var.", no collection or locality data)

Original measurements: Diam. maj. 27, minor 25, axis 13 mill."

Type locality Borneo: "Hab. ad Sarawak, Insulae Borneo. Teste W. Taylor" [lives at Sarawak, Island of Borneo according to W. Taylor]

Remarks Benson mentioned at least two shells in his original description: "A couple of specimens of each variety ... were brought to England by Lieut. W. Taylor ... to whom I am indebted for an example of each kind." The source of the UMZC shells is unknown but since they come from the type locality and form part of the McAndrew collection, it is likely that they once formed part of the Benson collection.

Genus *Quantula* H.B. Baker, 1941

Helix naninoides Benson, 1842

Accepted as *Quantula striata* (Gray, 1834):
Nanina striata Gray, 1834; 59

Helix naninoides Benson, 1842b: 486; Reeve, 1853 [in 1851–1854], 7 (*Helix*): pl. 171, species 1158

Nanina naninoides (Benson); Tryon, 1886: 79, Pl. 22, Fig. 37

Type material NHMUK 1842.9.30.2, **Fig. 74 B** (syntype presented by the Hon. East India Company labelled "*Helix naninoides* Cantor, scarce, Island of Chusan")

Original measurements: none given

Other material UMZC I.104475 (five shells from the R. McAndrew collection labelled "*Helix Naninoides* Benson", no collection or locality data)

Type locality Singapore and China: "Habitat. Singapore; scarce at Chusan"

Remarks Benson (1842b) did not state the number of specimens used for his original description but he later wrote that "Dr Cantor found three shells at different times lying on the ground in his garden at Ting-hae, but never saw it alive …" (Benson, 1855a: 122). No specimens from Singapore could be identified, although they might be represented by the poorly labelled Cambridge lot (UMZC I.104475). This species is commonly regarded as a synonym of *Quantula striata* (Gray, 1834), see Hausdorf (1995: 361). This is the only species of land snail known to be bioluminescent (Councilman and Ong, 1988; Daston and Copeland, 1993). Its range extends from the Malay Peninsula (Gude, 1903) to Thailand (Godwin-Austen, 1906), Cambodia (Van Mol, 1973) and Con Son (= Pulo Condore) off the coast of Cochin, China (Hausdorf, 1995).

Family EUCONULIDAE [59]

Subfamily EUCONULINAE

Genus *Louisia* Godwin-Austen, 1908

Louisia barclayi (Benson, 1850)

Helix barclayi Benson, 1850b: 252; Reeve, 1853 [in 1851–1854], 7 (*Helix*): pl. 174, species 1178

Nanina (*Microcystis*) *barclayana* (Benson); Nevill, 1878: 41

Nanina (*Pachystyla*) *barclayi* (Benson); Tryon, 1886: 25, pl. 6, figs 1, 2

Louisia barclayi (Benson); Godwin-Austen, 1908b: pl. 10, figs 1–1b

Pseudocaldwellia barclayi (Benson); Germain, 1921: 134

Type material UMZC I.100035, **Fig. 74 C** (lectotype designated by Verdcourt (1992: 172) with several associated labels: two written by Godwin-Austen read "*Erepta barclayi*, Benson. From a card (MacAndrew Coll.) labelled *Trochomorpha barclayi*, Bens. Mauritius cf. Reg. May 27th, 1908, 1." and "Figured for Paper in Ann. Mag. Nat. Hist. to appear July 1908 HHGA"; other labels read "Figured specimen" and "Mauritius, Benson Collection"; UMZC I.104535 (two paralectotypes, one broken, from the R. McAndrew collection labelled "*Erepta Barclayi* Bens., Bens. col., Mauritius"); UMZC I.104536 (five paralectotypes, one missing, from the R. McAndrew collection labelled "*Trochomorpha Barclayi* Bens., Bens. col., Mauritius"); UMZC I.104537 (eight paralectotypes, four missing, from the R. McAndrew collection labelled "*Trochomorpha Barclayi* Bens., Bens col., Mauritius")
Original measurements: "Diam. major 4, axis 2, long. apert. 1 mill., lat. vix 2½ mill."
Other material UMZC I.104538 (single shell from the R.McAndrew collection labelled "*Barclayi* Bens.", no collection or locality data)
Type locality Mauritius: "Hab. infrequens sub lapidibus in collibus Mokae, apud insulam Mauritii" [lives in small numbers under stones in the hills around Moka, on the Island of Mauritius]
Remarks In his original description, Benson mentioned that he found this species at several sites on Mauritius, but principally in the grounds belonging to Sir David Barclay at Moka. The lectotype is thought to be the shell figured by Godwin-Austen (1908, Pl. 10, Fig. 1). UMZC I.104538 belongs to an unrelated taxon. This species is the type of *Louisia* Godwin-Austen, 1908 by subsequent designation (Zilch, 1959: 306); *Pseudocaldwellia* Germain, 1918 is a junior synonym. This small arboreal species is abundant on the Mascarene Islands and Chagos (Griffiths and Florens, 2006), Aldabra (Gerlach and Griffiths, 2002) and the Seychelles (Verdcourt, 1992).

Superfamily HELICARIONOIDEA

Family HELICARIONIDAE

Subfamily HELICARIONINAE

Genus *Erepta* Albers, 1850

Helix suffulta Benson, 1853

Accepted as *Erepta odontina* (Morelet, 1851); *Helix odontina* Morelet, 1851: 219

Helix suffulta Benson, 1853a: 31; Reeve, 1853 [1851–1854], 7 (*Helix*): pl. 173, species 1175
Stylodonta (*Erepta*) *suffulta* (Benson); H. Adams and A. Adams, 1855: 187
Erepta odontina Morelet; Godwin-Austen, 1908b: 431
Microstylodonta odontina (Morelet); Germain, 1921: 124
Erepta suffulta (Benson); Schileyko, 2004: 1237
Type material UMZC I.104900 (syntype, now badly damaged, from the R. McAndrew collection labelled "*Erepta suffulta* Bens., Bens. col.", no locality data)
Original measurements: "Diam. major 8, minor 7, axis 5 mill."
Type locality Mauritius: "Hab. in Insula Mauritii. Teste Sir D.W. Barclay" [Habitat: in the Island of Mauritius. Seen by D.W. Barclay]
Remarks The number of specimens provided by Sir David Barclay was not noted in Benson's original description, and the specimens were apparently weathered: "it is probable that the species may have had a coloured epidermis." The surviving syntype is in such a delicate state that it could not be photographed. This species is a synonym of *Erepta odontina* (Morelet, 1851).

Erepta setiliris (Benson, 1859)

Helix setiliris Benson, 1859a: 99
Nanina (*Rotula* ?) *setiliris* (Benson); Nevill, 1878: 44
Nanina setiliris (Benson); Tryon, 1886: 133, Pl. 44, Fig. 52, 53
Tachyphasis (*Pseudophasis*) *setiliris* (Benson); Germain, 1921: 160
Erepta setiliris (Benson); Griffiths and Florens, 2006: 123
Type material UMZC I.104865.A, **Fig. 74 D** (one of seven syntypes from the R. McAndrew collection labelled "*Discus Setiliris* Bens., Bens. col., Mauritius")
Original measurements: "Diam. major 7, minor 6½, axis 4 mill."
Type locality Mauritius: "Habitat in sylvis insulae Mauritii cum praecedente" [lives with the preceding species [*Helix caldwelli*] in woodland on the Island of Mauritius]
Remarks The number of specimens provided by William Caldwell was not noted in Benson's original description. This rare species is endemic to Mauritius and Réunion. It occurred in humid woods in leaf-litter, notably in the Curepipe area (Benson, 1859a) and in woods at 660 m altitude (Nevill, 1870). It can still be found as a fossil on Mauritius, where it is now extinct. On Réunion, it is rare and localized, appearing to be restricted to moist high-altitude forest above 500 m, where it occurs in leaf-litter and under rocks (Griffiths and Florens, 2006).

Helix albidens Benson, 1853

Accepted as *Erepta stylodon* (L. Pfeiffer, 1842);
Helix stylodon Pfeiffer, 1842 [in 1841–1846]: 40

Helix albidens Benson, 1853a: 31–32; Reeve, 1853 [in 1851–1854], 7 (*Helix*): pl. 172, species 1167
Stylodonta (*Erepta*) *albidens* (Benson); H. Adams and A. Adams, 1855: 187
Microstylodonta stylodon (Pfeiffer, 1842); Germain, 1921: 123
Type material UMZC I.104045, **Fig. 74 E** (one of six syntypes from the McAndrew collection labelled "*Erepta Stylodon* Pfr = *Albidens* Bens., Bens. col., Mauritius")
Original measurements: "Diam. major 17, minor 15, axis 9 mill."
Type locality Mauritius: "ad Moka, Insulae Mauritii, rarissime. Teste Sir D.W. Barclay" [at Moka, Island of Mauritius, very rare, according to Sir D.W. Barclay]
Remarks The number of specimens provided by Sir David Barclay was not noted in Benson's original description. *Helix albidens* is a junior synonym of *Erepta stylodon* (L. Pfeiffer, 1842), an uncommon species that lives under rocks near Moka and Vallée des Pretres (Germain, 1921: 123; Griffiths and Florens, 2006).

Genus *Ctenophila* Ancey, 1882

Ctenophila caldwelli (Benson, 1859)

Helix caldwelli Barclay MSS in Benson, 1859a: 98
Nanina (*Erepta* ?) *caldwelli* (Benson); Nevill, 1878: 44
Erepta (*Ctenophila*) *caldwelli* (Benson, Barclay MSS); Godwin-Austen, 1908b: 430
Tachyphasis (*Tachyphasis*) *caldwelli* (Barclay) Benson; Germain, 1921: 154
Ctenophila caldwelli (Barclay); Griffiths and Florens, 2006: 115
Type material UMZC I.104255.A, **Fig. 74 F** (one of two syntypes from the McAndrew collection labelled "*Discus Caldwelli* Bens., Bens. col., Mauritius")
Original measurements: "Diam. major 9, minor 7½, axis 3 1/3 mill."
Other material NHMUK 1906.1.1.2311 (five shells, two of which are "ex-Nevill", from the W.T. Blanford collection labelled "*H. caldwelli* Bens: Rare. A remarkable type! Morelet named this *H. Paulus* but from a young shell").
Type locality Mauritius: "Hab. in sylvis insulae Mauritii" [lives in forests on the Island of Mauritius]
Remarks This species is often attributed to Barclay or to Barclay in Benson, 1859 but authorship should be attributed to Benson since he provided the description using a name requested by Sir David Barclay. The number of specimens found by Caldwell in "a previously unexplored forest on the heights of Plaines Wilhelm, towards the head of Tamarind River and of the gorges of the Black River" was not noted in the original description. This species is the type of *Ctenophila* Ancey, 1882 by subsequent designation (Zilch, 1959: 306); *Tachyphasis* Germain, 1918 is a junior objective synonym. *Ctenophila caldwelli* is endemic to Mauritius, where it was regarded as common in the 19th century, being found on rocks, on the ground or on grass at Port Louis, Curepipe, in the Black River Gorge and at Tamarind Falls (Benson, 1859a). Today it is critically endangered and has been identified only from native forests of Le Pouce, Mt Brise Fer and Piton de la Petite Rivière Noire (Griffiths and Florens, 2006).

Subfamily DURGELLINAE

Tribe DURGELLINI

Genus *Durgella* W.T. Blanford, 1863

Durgella levicula (Benson, 1859)

Helix levicula Benson, 1859f: 391; Pfeiffer, 1868 [in 1847–1877]: 48; Hanley and Theobald, 1874 [in 1870–1876]: 37, Pl. 90, Figs 1, 4
Nanina (*Durgella*) *levicula* (Benson); Blanford, 1863b: 84; Tryon, 1886: 111, pl. 37, figs 8, 9
Nanina levicula (Benson); Nevill, 1878: 26
Durgella levicula (Benson); Godwin-Austen, 1881: 291, pl. xx, figs 1 and 2 (shell), pl. xxi, figs 1, 3, 3a and 5 (anatomy); 1883 [in 1882–1888]: 142; 1898 [in 1897–1914] 61, Pl. 76, Fig. 1–6; Blanford and Godwin-Austen, 1908: 213, Fig. 75; Ramakrishna et al., 2010: 308
Type material NHMUK 1888.12.4.506, **Fig. 75 A** (holotype from the W. Theobald collection labelled "*Macrochlamys levicula* Benson, Tenasserim")
Original measurements: "Diam. major 7, minor 5½, axis 3½ mill.; apert. 4 longa, 4½ mill lata."
Other material UMZC I.102570 (two shells from the R. McAndrew collection labelled "*Nanina Levicula* Bens., Bens. col., Bassein, Ind.")
Type locality Burma: "Habitat ad Phie Than, raro occurrens" [lives at Phie Than, occurs rarely]
Remarks Benson based his original description on "a single specimen in Mr. Theobald's collection". Theobald (1857: 250) had previously listed Benson's manuscript name without providing a description, noting that the species was rare. Phie Than is in the Tenasserim valley and therefore consistent with the locality for NHMUK 1888.12.4.506. This is the type species of *Durgella* W.T. Blanford, 1863 by subsequent designation (Godwin-Austen, 1881: 291).

Durgella salius (Benson, 1859)

Vitrina salius Benson, 1859e: 189; Pfeiffer, 1859 [in 1847–1877]: 799; Reeve, 1862 [1859–1862], 13 (*Vitrina*): pl. 2, species 7; Hanley and Theobald, 1873 [in 1870–1876]: 29, Pl. 65, Figs 8, 9
Austenia salius (Benson); Godwin-Austen, 1883 [in 1882–1888]: 152, Pl. 37, Fig. 1; Godwin-Austen, 1898 [in 1897–1914]: 65
Helicarion salius (Benson); Nevill, 1878: 14; Tryon, 1885: 181, pl. 42, figs 24–26
Durgella salius (Benson); Blanford and Godwin-Austen, 1908: 217; Ramakrishna et al., 2010: 309
Type material UMZC I.102705, **Fig. 75 B** (syntype from the McAndrew collection labelled "*Vitrina Salius* Bens., Bens. col., Teria Ghat")
Original measurements: "Diam. major 8, minor 6, axis 4 mill.; apert. lat. 4½, alt. 4½ mill."
Type locality India: "Habitat ad Teria Ghat" [lives at Teria Ghat]
Remarks The number of specimens provided by William Theobald was not noted in the original description. The species was given its name because of its habit of springing several inches from the ground when disturbed. Benson (1859e) also reported that William Blanford had found this species at Darjiling, and some of his specimens appear to have been donated to the Indian Museum (Nevill, 1878: 14). In India this species occurs in a number of regions including Manipur, Meghalaya, Sikkim and West Bengal (Ramakrishna et al., 2010).

Durgella ? *seposita* (Benson, 1859)

Helix seposita Benson, 1859h: 267; Pfeiffer, 1868 [in 1847–1877]: 51
Nanina (*Durgella*) *levicula* (Benson); Blanford, 1863b: 84
Durgella ? *seposita* (Benson); Blanford and Godwin-Austen, 1908: 217; Ramakrishna et al., 2010: 309
Type material not located
Original measurements: "Diam. major 7, minor 5½, axis 5 mill.; apert. long. 4 ½, lat. 4 mill."
Type locality India: "Habitat prope Darjiling. Detexit H. Blanford; communicavit W. Theobald jun." [lives near Darjiling. Found by H. Blanford; sent by W. Theobald jun.]
Remarks Benson based his description on one shell: "The single example seen was received by Mr. Theobald from Mr. H.F. Blanford, and although uninjured in form, is evidently not in a fresh state." Blanford and Godwin-Austen (1908: 218) wrote that "there must remain some doubt as to whether there may not have been an error in the locality, or whether the solitary specimen procured was not the young of some better-known shell. Two specimens from Theobald's Collection, now in the British Museum, do not agree satisfactorily with the original description." Hanley and Theobald (1876 [in 1870–1876]: viii) remarked that this species was only known to them as a sketch of Benson's, which precisely resembled shells given to them by Blanford as his *Euplecta mucosa*, although this is also a poorly understood species. Godwin-Austen (1881: 292) mentioned that Nevill considered *seposita* to be identical to Godwin-Austen's *Macrochlamys bilineata* from the Dafla Hills." We here treat *Helix seposita* as a *nomen dubium*.

Genus *Sivella* W.T. Blanford, 1863

Sivella castra (Benson, 1852)

Helix castra Benson, 1852b: 349; Reeve, 1853 [in 1851–1854], 7 (*Helix*): pl. 172, species 1160; Theobald, 1857: 250; Hanley and Theobald, 1874 [in 1870–1876]: 35, Pl. 83, Figs 1–3
Helix (*Sivella*) *castra* Benson; Blanford, 1863b: 86
Helix (*Trochomorpha*) *castra* Benson; Tryon, 1887: 84, pl. 16, figs 5–7
Trochomorpha castra (Benson); Stoliczka, 1873: 21, pl. I, figs 14–16 [shell], pl. II, figs 7–9 [anatomy]
Trochomorpha (*Sivella*) *castra* (Benson); Nevill, 1878: 56; Gude, 1914a: 3
Sivella castra (Benson); Godwin-Austen, 1895a: 284, Pl. 19, Fig. 5 (anatomy); Ramakrishna et al., 2010: 236
Videna castra (Benson); Foon et al., 2017: 77
Type material UMZC I.103925, **Fig. 75 C** (syntype from the R. McAndrew collection labelled "*Videna Castra* Bens., Bens. col", no locality data); UMZC I.103920 (two syntypes from the R. McAndrew collection labelled "*Videna Castra* Bens., Bens. col, Darjeerling")
Original measurements: "Diam. major 12, minor 10½, axis 4 mill."
Other material NHMUK 1860.6.27.13 (single shell presented by W.T. Blanford labelled "*Helix castra* Benson, Darjiling, W.T. Blanford"); NHMUK 1879.12.26.64–66 (four shells labelled "*H. castra* Bens., Darjiling", three of which were presented by Thomas Horsfield, curator of the India Museum (to which the registration numbers relate); the fourth is from the Cuming collection but was not registered)
Type locality India: "Hab. ad Darjiling. Teste R. Trotter" [lives at Darjiling, according to R. Trotter]
Remarks The number of specimens provided by Robert Trotter was not noted in Benson's original description. Theobald (1857) reported a single specimen from Burma. *Sivella castra* occurs throughout Maharashtra and in West Bengal (Ramakrishna et al., 2010) and across Peninsular

Malaysia and parts of Thailand (Maassen, 2001). *Helix castra* is the type species of *Sivella* W.T. Blanford, 1863 by subsequent designation (Stoliczka, 1873: 20).

Sivella galerus (Benson, 1856)

Helix galerus Benson, 1856d: 96; Hanley and Theobald, 1874 [in 1870–1876]: 35, Pl. 83, Figs 5, 6
Trochomorpha (*Sivella*) *castra* var. *galerus* (Benson); Nevill, 1878: 56
Helix (*Patula*) *galerus* Benson; Tryon, 1887: 75, pl. 14, figs 2, 3
Helix (*Trochomorpha*) *galerus* Benson; Tryon, 1887: 75, pl. 14, figs 2–3
Trochomorpha (*Sivella*) *galerus* (Benson); Gude, 1914a: 5
Sivella galerus (Benson); Naggs and Raheem, 2000: Fig. 40
Type material not located
Original measurements: "Diam. major 9, minor 8, axis 4 mill."
Other material UMZC I.103055, **Fig. 75 D** (single shell from the R. McAndrew collection labelled "*Trochomorpha Galerus* Bens., Bens. col., Ellegamua"); NHMUK 1892.8.26.8 (single shell presented by Col. Yerbury labelled "*galerus* Benson, Ceylon")
Type locality Sri Lanka: "Hab. ad Ragama, Ceylon. Coll. E.L. Layard" [lives at Ragama, Ceylon. Collection of E.L. Layard]
Remarks The number of specimens in Edgar Layard's collection was not noted in Benson's original description. The Benson collection shell figured here is not labelled as coming from the type locality and is therefore not considered part of the type series. It is also larger than the original dimensions provided by Benson. No further specimens of this species could be found in the NHM.

Genus *Eurychlamys* Godwin-Austen, 1899

Eurychlamys regulata (Benson, 1860)

Helix regulata Benson, 1860b: 383; Pfeiffer, 1868 [in 1847–1877]: 125; Hanley and Theobald, 1870 [in 1870–1876]: 15, Pl. 31, Figs 5, 6
Nanina (*Macrochlamys*) *regulata* (Benson); Tryon, 1886: 96, pl. 32, figs 39, 40
Eurychlamys regulata (Benson); Godwin-Austen, 1899 [in 1897–1914]: 92, pl. 84, figs 2a–g; Blanford and Godwin-Austen, 1908: 190, Fig. 65E–I (shell and anatomy)
Type material UMZC I.103308.A, **Fig. 75 E** (one of three syntypes from the R. McAndrew collection labelled "*Nanina Regulata* Bens., Bens. col.", no locality data)
Original measurements: "Diam. major 11, minor 9, axis 6 mill."
Type locality Sri Lanka: "ad Kaluganga, pagi Matelle orientalis, necnon ad Katukellekande" [At Kaluganga, east of the Matelle district, and at Katukellekande]
Remarks The number of specimens found by Frederick Layard was not noted in the original description. The three shells in the UMZC match Benson's description and the largest is consistent with his measurements.

Eurychlamys vilipensa (Benson, 1853)

Helix vilipensa Benson, 1853c: 93; Pfeiffer, 1859 [in 1847–1877]: 49; Hanley and Theobald, 1874 [in 1870–1876]: 37, Pl. 89, Figs 4, 5, 6
Nanina (*Macrochlamys*) *villipensa* [sic] (Benson); Tryon, 1886: 94, pl. 32, figs 16, 17
Macrochlamys ? *vilipensa* (Benson); Blanford and Godwin-Austen, 1908: 137
Eurychlamys vilipensa (Benson); Raheem et al., 2014: 79, Fig. 46C–F
Type material UMZC I.103965, **Fig. 75 F** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 79, Fig. 46C) from the R. McAndrew collection labelled "*Nanina Vilipensa* Bens., Bens. col., Ceylon")
Original measurements: "Diam. major 8, minor 7, axis 4 mill."
Type locality Sri Lanka: "Hab. ad rupem Mehintali… collected by Edgar L. Layard, Esq., in Ceylon" [Habitat: at Mehintali cliff…]
Remarks *Helix vilipensa* was described by Benson from material collected by Edgar Layard on Ceylon. Blanford and Godwin-Austen (1908: 137) included *vilipensa* in the genus *Macrochlamys* but the reproductive anatomy of this taxon does not resemble *Macrochlamys indica*, the type species of *Macrochlamys*. It is similar to *Eurychlamys platychlamys*, the type of *Eurychlamys*, to which genus *vilipensa* is now referred (Raheem et al., 2014). *E. vilipensa* is endemic to Sri Lanka and the Western Ghats (Raheem et al., 2014).

Genus *Sitala* H. Adams, 1865

Sitala arx (Benson, 1859)

Helix arx Benson, 1859e: 184; Pfeiffer, 1868 [in 1847–1877]: 90; Hanley and Theobald, 1872 [in 1870–1876]: 25, Pl. 54, Fig. 8
Nanina (*Trochomorpha*) *arx* (Benson); Blanford, 1863b: 84
Nanina (*Sitala*) *arx* (Benson); Nevill, 1878: 34; Tryon, 1886: 54, Pl. 25, Fig. 18
Sitala arx (Benson); Godwin-Austen, 1882: 36, Pl. 9, Fig. 8; Blanford and Godwin-Austen, 1908: 229; Ramakrishna et al., 2010: 312

Type material a neotype (UMZC I.102575.A, **Fig. 76 A**) is hereby designated from a series of six shells from the R. McAndrew collection labelled "*Trochomorpha Arx* Bens., Tenasserim"; an additional circular label reads "Note the largest figd in Pt. ii Ind. Mol. by H. G.–A."). We have designated a neotype with the express purpose of clarifying the taxonomic status of *S. arx* (see below).
Original measurements: "Diam. major 10, minor 9, axis 7½ mill."
Other material; NHMUK 1888.12.4.483–485 (three shells from the W. Theobald collection labelled "*Sitala arx* Bens., Tenasserim")
Type locality Burma: "Habitat ad collem Therabuin, vallis Tenasserim, nec raro; detexit W. Theobald" [lives at Therabuin Hill, Tenasserim Valley, but rarely; discovered by W. Theobald]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. Theobald (1857: 250) had previously included Benson's manuscript name in his list of Burmese species without providing a description, noting that the species was rare. UMZC I.102575 is not labelled as coming from the Benson collection, although this is likely. Nevill (1878: 34) listed a lot of seven specimens labelled "Therabuin Hill, Tenasserim; coll. W. Theobald Esq.; ex c. As. Soc. Bengal" in the Indian Museum. According to Ramakrishna et al. (2010), this species has also been recorded from India (Manipur).

Sitala attegia (Benson, 1859)

Helix attegia Benson, 1859e: 184; Pfeiffer, 1867 [in 1854–1869], 3, 327: pl. 78, figs 17–19; Pfeiffer, 1868 [in 1847–1877]: 91; Pfeiffer, 1876: 104; Hanley and Theobald, 1874 [in 1870–1876]: 36, pl. 86, figs 6 and 7; Godwin-Austen, 1882 [in 1882–1888]: 29, pl. 8, figs 2–2f
Nanina (*Trochomorpha*) *attegia* (Benson); Blanford, 1863b: 84
Conulema attegia (Benson); Stoliczka, 1871: 236
Nanina (*Sitala*) *attegia* (Benson); Nevill, 1878: 33; Tryon, 1886: 52, pl. 24, figs 6, 7
Sitala attegia (Benson); Blanford and Godwin-Austen, 1908: 227; Ramakrishna et al., 2010: 313
Type material UMZC I.102475.A, **Fig. 76 B** (one of five syntypes from the R. McAndrew collection labelled "*Hemiplecta Attegia* Bens., Bens. col., Tenasserim")
Original measurements: "Diam. major 8, minor 7, axis 8 mill."
Other material NHMUK 1888.12.4.1500–1502 (three shells from the W. Theobald collection, labelled "*Sitala attegia* Benson, Pegu"); NHMUK 1906.2.2.50 (four shells from the W.T. Blanford collection labelled "*Sitala attegia* Benson, Phiethan, Tenasserim")
Type locality Burma: "Habitat ad Phie Than, vallis Tenasserim, frequens" [lives at Phie Than, Tenasserim Valley, common]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. Theobald (1857: 250) had previously included Benson's manuscript name in his list of Burmese species without providing a description, noting that he had only found it rarely at the type locality. Stoliczka (1871) designated *attegia* as the type species of his new genus *Conulema*, which has since been included in the synonymy of *Sitala* (cf. Stolickza, 1873: 16).

Sitala palmaria (Benson, 1864)

Helix palmaria Benson, 1864a: 137; Pfeiffer, 1868 [in 1847–1877]: 75; Hanley and Theobald, 1870 [in 1870–1876]: 15, pl. 30, figs 5, 6
Nanina (*Sitala*) *palmaria* (Benson); Tryon, 1886: 54, Pl. 25, Fig. 17
Sitala palmaria (Benson); Godwin-Austen, 1882 [in 1882–1888]: 35, Pl. 10, Fig. 3; Blanford and Godwin-Austen, 1908: 230; Ramakrishna et al., 2010: 315; Raheem et al., 2014: 85, Fig. 51C–D
Type material UMZC I.103075.A, **Fig. 76 E** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 85, Fig. 51C), labelled "*Iberus Palmaria* Bens., Bens. col.", no locality data); UMZC I.103075.B, **Fig. 76 F** (paralectotype from the same lot); NHMUK 1906.3.3.66 (paralectotype from the W.T. Blanford collection, labelled "*Sitala palmaria* Bs, Nundydroog, Mysore, Benson")
Original measurements: "Diam. major 8½, minor 8, axis 6 mill."
Type locality India: "Habitat ad montem Nundydroog in regione Mysoriana." [lives at the hill Nundydroog in the Mysore region]
Remarks Benson based his original description on three shells. The UMZC shells appear to be the two "imperfect specimens" collected by his son, Charles Annesley Benson, "on the Fort Hill of Nundydroog, north of Bangalore, in Mysore" and the NHM shell appears to be the single "fully grown, but weathered" specimen collected by his daughter, Mrs R.H. Sankey "at the same place, about 4000 feet above the level of the sea" that was later given to Blanford. Godwin-Austen (1882 [in 1882–1888]: 36) later noted that the NHM shell was "a typical specimen from Benson, from the original locality". This species is endemic to South India, where it has been identified from an isolated hill range (the Nandi Hills), 60 km north of

Bangalore, and from "Wynaad" in the central Western Ghats (Raheem et al., 2014).

Sitala phyllophila (Benson, 1863)

Helix phyllophila Benson, 1863b: 320; Pfeiffer, 1868 [in 1847–1877]: 86; Hanley and Theobald, 1873 [in 1870–1876]: 28, Pl. 61, Fig. 10
Nanina (*Microcystis*) *phyllophila* (Benson); Nevill, 1878: 41
Nanina phyllophila (Benson); Tryon, 1886: 59, Pl. 26, Fig. 46
Sitala ? *phyllophila* (Benson); Blanford and Godwin-Austen, 1908: 232
Sitala phyllophila (Benson); Naggs and Raheem, 2000: Fig. 89
Material UMZC I.103290.A, **Fig. 77 A** (one of four shells from the R. McAndrew collection labelled "Ceylon")
Original measurements: "Diam. major 5, minor 4½, axis 5 mill."
Type locality Sri Lanka: "Habitat ad Badulla, Ceylon. Teste F. Layard" [lives at Badulla, Ceylon, according to F. Layard]
Remarks Benson based his original description on at least two specimens: "The fully grown shell was taken at Badulla, on Love-apple leaves; and a depressed form, which appears to me to be the young, on those of Coffee-plants". The UMZC specimens may not be from Benson's collection, although this is likely.

Sitala rimicola (Benson, 1859)

Helix rimicola Benson, 1859h: 266; Pfeiffer, 1868 [in 1847–1877]: 71; Hanley and Theobald, 1873 [in 1870–1876]: 28, Pl. 61, Fig. 1
Nanina (*Sitala*) *rimicola* (Benson); Tryon, 1886: 55, pl. 25, figs 20, 21
Sitala ? *rimicola* (Benson); Godwin-Austen, 1882 [in 1882–1888]: 36, pl. 9, figs 2, 3 and 4; Godwin-Austen, 1899 [in 1897–1914]: 48; Blanford and Godwin-Austen, 1908: 236
Sitala rimicola (Benson); Ramakrishna et al., 2010: 316; Budha et al., 2015: 21
Material UMZC I.102685.A, **Fig. 77 B** (one of three shells from the R. McAndrew collection labelled "*Trochomorpha Rimicola*" and "*Nanina* (*Trochomorpha*) *barrakporensis*", no locality data).
Original measurements: "Diam. major 4½, minor 4, axis 4 mill."
Type locality India: "Habitat forma typica prope Landour Himalayae occidentalis, varietas in valle Rungun prope Darjiling, rarissime" [the typical form lives near Landour in the western Himalaya, varieties more rarely in the Rungun valley near Darjiling]
Remarks Benson (1859h: 266) noted that he "got a single fresh specimen of this fragile species, in October 1842 ... The Messrs. Blanford have lately procured the variety, but rarely and in a dead state, in the Rungun Valley in Sikkim, at an elevation of 4000 feet." This species occurs across India and Nepal (Budha et al., 2015).

Sitala turbiniformis (Benson, 1838)

Helix turbiniformis Benson, 1838b: 218
Helix infula Benson, 1848b: 160; Reeve, 1852 [in 1851–1854], 7 (*Helix*): pl. 129, species 783; Pfeiffer, 1853 [in 1847–1877]: 58; Pfeiffer, 1876 [in 1847–1877]: 103; Hanley and Theobald, 1872 [in 1870–1876]: 25, Pl. 54, Fig. 9
Nanina (*Trochomorpha*) *infula* (Benson); Blanford, 1863b: 84
Conulema infula (Benson); Stoliczka, 1871: 239, pl. 18, figs 5–9
Nanina (*Sitala*) *infula* (Benson); Nevill, 1878: 33; Tryon, 1886: 52, pl. 24, figs 4, 5
Sitala infula (Benson); Godwin-Austen, 1882 [in 1882–1888]: 26, pl. 8, figs 1–1f; Blanford and Godwin-Austen, 1908: 225, Fig. 78; Ramakrishna et al., 2010: 314; Raheem et al., 2014: 84–85, Figs 50E–F and 51A
Type material UMZC 102405.A, **Fig. 76 C** (lectotype of *Helix infula* Benson, 1848 from the R. McAndrew collection labelled "*Trochomorpha Infula* Bens, Ind.", here designated as the lectotype of *Helix turbiniformis* Benson, 1838); UMZC I.102405.B, **Fig. 76 D** (one of 11 paralectotypes of *Helix infula* Benson, 1848, now also paralectotypes of *Helix turbiniformis* Benson, 1838 from the same lot); NHMUK 1954.6.2.296 (paralectotype of *Helix infula* Benson, 1848 now also paralectotype of *Helix turbiniformis* Benson, 1838 from the J.S. Hawkins collection labelled "*Helix infula* Benson, ?Paratype, Bengal, India")
Original measurements: "Diam. maj. 7 mill. Axis 5 mill. Mus nost." [my collection]
Other material UMZC I.102400 (single shell from the R. McAndrew collection labelled "*Trochomorpha Infula* Var.", no collection data); NHMUK 1906.1.1.180 (single shell from the W.T. Blanford collection labelled "*Sitala infula* Benson, figd. Moll. Ind. Pl. VIII, f.1, Calcutta")
Type locality India: "Hab. prope urbem Murshedabad Bengaliae, necnon prope collem Patharghata, provinciae Bahar" [lives near the town of Murshedabad, Bengal, and also near Patharghata Hill, Bahar Province]
Remarks In his description of *Helix infula* (Benson, 1848b: 160), Benson recalled collecting specimens in 1835 "on the leaves of trees and shrubs at the two

places above-noted", and alluded to having published it as *Helix turbiniformis* Benson in the "Journal of the Asiatic Society of Calcutta" [*Journal of the Asiatic Society of Bengal*]. Indeed, he had mentioned this species in two earlier publications, the first of which did not include a name: "At the foot of the hill [Patharghata] a single specimen of a small conoid *Helix*, which I had recently discovered at Berhampore, was found adhering to the leaves of a shrub" (Benson, 1836a: 357). He introduced the name *H. turbiniformis* in comments appended to Thomas Hutton's description of *Helix fastigiata*, noting: "It [*H. fastigiata*] is more lengthened proportionally than either '*H. turbiniformis*' of *Patargatha* and *Berhampore*, alluded to in p.357, vol. 5, of this Journal, or the European species '*H. conica*' and *'convidea*'… It differs altogether from the two latter in substance and coloring which approach to those of '*H. turbiniformis*'…" (Benson 1838b: 218). Benson therefore made the name *H. turbiniformis* Benson available in 1838, although by the time he redescribed the species in 1848 he was aware that it had been used for a Pfeiffer species, leading him to use *Helix infula* instead. Benson's name *turbiniformis* has priority, however, and Pfeiffer's species *Lacteoluna turbiniformis* (L. Pfeiffer, 1839) requires a replacement name. Benson's *Helix turbiniformis* is not listed by Sherborn (1931 [in 1922–1932]: 6688). UMZC I.102405.A was designated as the lectotype of *Helix infula* Benson, 1848 by Raheem and Naggs (Raheem et al., 2014: 84–85, Fig. 50E). *Sitala turbiniformis* has a wide distribution in India and has also been recorded from Burma. This is the type species of *Sitala* H. Adams, 1865, itself the type genus of the Sitalinae Godwin-Austen, 1900.

Genus *Sophina* Benson, 1859

Sophina calias (Benson, 1859)

Helix calias Benson, 1859d: 473; Pfeiffer, 1868 [in 1847–1877]: 112; Hanley and Theobald, 1876 [in 1870–1876]: 58, pl. 147, figs 2, 3
Nanina (*Sophina*) *calias* (Benson); Nevill, 1878: 52; Tryon, 1886: 109, pl. 37, figs 86–90
Sophina calias (Benson); Blanford and Godwin-Austen, 1908: 286, Fig. 87A and A^1
Type material UMZC I.102715.A, **Fig. 77 C** (one of two syntypes from the R. McAndrew collection labelled "*Nanina* (*Sophina*) *calias* Bens., Bens. col., Moulmein")
Original measurements: "Diam. major 9, minor 7½, axis 4 mill."
Other material UMZC I.102680, **Fig. 77 D** (one of two shells from the R. McAndrew collection labelled by Hanley "Type of *Sophina calias*"); UMZC I.102710 (five shells from the R. McAndrew collection labelled "*Sofina Calias*", no collection or locality data)
Type locality Burma: "Habitat prope Moulmein" [lives near Moulmein]. Benson (1859d: 472) also stated that Sankey's material was collected "in a singularly perforated limestone hill at Damathá, about twelve miles N.E. of Moulmein"
Remarks The number of shells provided by Richard Sankey was not stated in Benson's original description. The larger of the two specimens from lot UMZC I.102680 conforms to the dimensions provided by Benson in his original description, although its label is a replacement lacking original data.

Sophina forabilis (Benson, 1859)

Helix forabilis Benson, 1859f: 389; Pfeiffer, 1868 [in 1847–1877]: 112
Sophina forabilis (Benson); Hanley and Theobald, 1876 [in 1870–1876]: 58, pl. 147, figs 1, 4; Blanford and Godwin-Austen, 1908: 288, Fig. 87F, F^1, F^{11}
Nanina (*Sophina*) *forabilis* (Benson); Nevill, 1878: 52; Tryon, 1886: 110, pl. 37, figs 91, 92
Type material not located
Original measurements: "Diam. major 8, minor 7, axis 4 mill."
Other material UMZC I.102520 (single shell from the R. McAndrew collection labelled "*Sofina Forabilis* Var., Bens. col., Moulmein"); UMZC I.102515.A, **Fig. 77 E** (one of four shells from the R. McAndrew collection labelled "*Sofina Forabilis* Benson, Bens. col.", no locality data); NHMUK 1954.6.2.248–251 (four shells from the J.S. Hawkins collection labelled "*Sophina forabilis* Benson, ?Paratypes, Moulmein". An accompanying label in Robert Gordon's handwriting reads "3. *Helix forabilis* B. n. s., the small shell, see *Annals* for January 1860 and July 1859". A label added by G.A.S. Barnacle states "Doubtful. Probably two species: large ones *S. calias* Benson, small ones *S. schistostelis* Benson. All too large for "*forabilis*"); NHMUK 1888.12.4.457–460 (four shells from the W. Theobald collection labelled "*Sophina forabilis* Benson, Damothat Hill, Moulmein"); EXEMS: 1720/1909/D6/120/1 (four shells, ex-Theobald, from the J.E. Linter collection)
Type locality Burma: "Habitat ad Phie Than" [lives at Phie Than]
Remarks Benson based his description on a single shell provided by William Theobald: "The single specimen obtained for examination is not in good order, and the aperture is clearly defective". Theobald (1857: 250) had previously listed Benson's manuscript name without providing a description, noting that the species was very rare. All of the Benson collection specimens in the UMZC are complete and therefore cannot be the

damaged holotype, which also does not appear to have survived in Theobald's collection. Despite being tentatively labelled as "paratypes", the two shells in the J.S. Hawkins collection (NHMUK 1954.6.2.248–251) were given to him by Robert Gordon and appeared in a manuscript list accompanying these specimens as "3. *Sophina schistostelis* and *Sophina forabilis*" (MSS_ZOO_HAW).

Sophina schistostelis (Benson, 1859)

Helix schistostelis Benson, 1859d: 473; Pfeiffer, 1868 [in 1847–1877]: 111
Sophina schistostelis Benson; Hanley and Theobald, 1876 [in 1870–1876]: 58, pl. 147, figs 5, 6; Blanford and Godwin-Austen, 1908: 286, Fig. 86 [anatomy], Fig. 87B and B[1] [shell]
Nanina (*Sophina*) *schistostelis* (Benson); Nevill, 1878: 52
Nanina (*Sophina*) *calias* var. *schistostelis* (Benson); Tryon, 1886: 110, pl. 37, figs 89–90
Type material UMZC I.102480.A, **Fig. 77 F** (one of three syntypes from the R. McAndrew collection labelled "*Sofina Schisosteles* Var. Bens., Bens. col., Moulmein"); NHMUK 1873.1.21.6 (six syntypes, two adults and four juveniles, presented by R. McAndrew labelled "*Sophina schistostelis* Benson, Moulmein")
Original measurements: "Sp. descript. [specimen described] Diam. major 11, minor 10, axis 6½ mill. Majoris imperfecti [imperfect larger form] diam. major 16, minor 13½, axis 8½ mill."
Other material UMZC I.102485 (nine shells from the R. McAndrew collection labelled "*Sofina Schistosteles* Bens.", no collection or locality data); UMZC I.102490 (single large shell from the R. McAndrew collection labelled "*Sofina Schisostoma*", no collection or locality data); NHMUK 1954.6.2.244–245 (two shells from the J.S. Hawkins collection, received from Robert Gordon, labelled "*Helix schistostelis* Benson, Paratypes, Molmein [Moulmein], Tenasserim province, Burma")
Type locality Burma: "Habitat prope Moulmein" [lives near Moulmein].
Remarks The number of specimens provided by Richard Sankey was not noted in Benson's original description, although the variety of measurements provided imply that there were several. He also stated that Sankey's material was collected "in a singularly perforated limestone hill at Damathá, about twelve miles N.E. of Moulmein" (Benson, 1859d: 472). UMZC I.102490 is much larger than the other specimens given this name and clearly belongs to a different species. Tate (1868) fixed *Helix schistostelis* as the type species of *Sophina* Benson, 1859.

Genus *Satiella* Godwin-Austen, 1908

Satiella membranacea (Benson, 1853)

Vitrina membranacea Benson, 1853c: 93; Pfeiffer, 1859 [in 1847–1877]: 792; Reeve, 1862 [in 1859–1862], 13 (*Vitrina*): pl. 10, species 78; Hanley and Theobald, 1876 [in 1870–1876]: 61, Pl. 152, Fig. 10
Helicarion membranaceus (Benson); Tryon, 1885: 177, pl. 40, figs 34, 35
Satiella membranacea (Benson); Blanford and Godwin-Austen, 1908: 224; Naggs and Raheem, 2000: Fig. 87
Type material NHMUK 1912.8.16.348, **Fig. 78 A** (syntype from the E.L. Layard collection labelled "*Vitrina membranacea* B., Ceylon" and "Benson type" (**Fig. 78 B**) in Edgar Layard's handwriting)
Original measurements: "Diam. major 11, minor 8, alt. 4 mill."
Type locality Sri Lanka: "Hab. ad portas montanas Balcadua dictas, lapidibus adhaerens" [lives at the mountain pass known as Balcadua, adhering to stones]
Remarks The number of specimens provided by Edgar Layard was not noted in the original description.

Genus *Austenia* G. Nevill, 1878

Austenia gigas (Benson, 1836)

Vitrina gigas Benson, 1836a: 350; Pfeiffer, 1848 [in 1847–1877]: 496; Hanley and Theobald, 1873 [in 1870–1876]: 29, pl. 66, figs 2, 3
Helicarion gigas (Benson); Godwin-Austen, 1875c: 6, pl. 3 (animal extended)
Helicarion (*Austenia*) *gigas* (Benson); Nevill, 1878: 16; Tryon, 1885: 179, pl. 42, figs 6, 7
Austenia gigas (Benson); Godwin-Austen, 1880b: 294, pls 24–27; Godwin-Austen, 1883 [in 1882–1888]: 148; 1888 [in 1882–1888]: 228, pl. 55, figs 3–4b, pl. 60, Figs 1, 1a, Pl. 62, Fig. 8; 1899 [in 1897–1914]: pl. 89, 90; Blanford and Godwin-Austen, 1908: 192, Figs 66 [shell] and 67 [anatomy]; Ramakrishna et al., 2010: 256
Type material UMZC I.102110.A, **Fig. 78 C** (one of three syntypes from the R. McAndrew collection labelled "*Vitrina Gigas* Benson, Sarcha, Cachmir", no collection data. The last locality has subsequently been deleted in pencil and replaced by "Khasi". Another label reads "*Austenia*, *Helicarion gigas* Bens., Bengal (3)")
Original measurements: "Diam. 1.15 poll."
Type locality Bangladesh: part of a collection "chiefly made in the hills on the N.E. Frontier of Bengal"
Remarks The number of specimens examined was not noted in Benson's original description, which was based on material in the Museum of the Asiatic Society acquired from an expedition to "Sylhet, Cherra Poonji

and the Khasi Hills" (Pearson, 1833). The UMZC specimens are not labelled as coming from the Benson collection, although this is likely. Nevill (1878: 16) listed a lot of three shells labelled "Cherra Poonjee; ex c. As. Soc. Bengal" in the Indian Museum (see also Theobald, 1860: 73), which we presume forms part of Benson's type series. At least one syntype from the Asiatic Society's collection was included amongst a collection of fifty Indian species donated to the EIC's India Museum in 1839 (Pearson, 1840). Some of this material was in turn transferred to the BM in 1841, although *Vitrina gigas* was not listed amongst these specimens. The species was, however, mentioned in an accompanying note in the margin of the register ("*Vitrina gigas* is a fine, large species"), possibly refering to material that remained on display in the India Museum. *Austenia gigas* has also been recorded from Burma (Nevill, 1877). This is the type species of *Austenia* Nevill, 1878 by original designation.

Austenia scutella (Benson, 1859)

Vitrina scutella Benson, 1859e: 188; Pfeiffer, 1859 [in 1847–1877]: 798; Reeve, 1862 [1859–1862], 13 (*Vitrina*): pl. 2, species 13; Hanley and Theobald, 1873 [in 1870–1876]: 29, pl. 66, figs 1–4
Helicarion scutella (Benson); Theobald, 1878: 143; Nevill, 1878: 15; Tryon, 1885: 176, pl. 40, figs 24, 25
Austenia scutella (Benson); Godwin-Austen, 1888 [in 1882–1888]: 232, pl. 52, figs 1–1e
Euaustenia scutella (Benson); Godwin-Austen, 1910 [in 1897–1914]: 275, Plate XXIV, figs 3–3c and 4–4c
Type material UMZC I.102760, **Fig. 90 A** (syntype from the R. McAndrew collection labelled "*Vitrina Scutella* Bens., Bens. col., Teria Ghat", here designated as the lectotype)
Original measurements: "Diam major 18, minor 13, axis 6 mill.; Apert. lat. 12, alt. 7 mill. [Nasmana shell]; Diam. major 16, minor 11, axis 5 mill.; Apert. lat. 11, alt. 6 mill. [Teria Ghát shell]"
Other material NHMUK 1888.12.4.796, **Fig. 90 B** (one of two shells from the W. Theobald collection labelled "*Vitrina scutella* Bs., Nasmana on the Chandi river, Kashmir")
Type locality India: "Teria Ghat"
Original locality India: "Habitat ad Teria Ghát, montium Khasiae; necnon ad Nasmana, regionis Kashmir" [lives at Teria Ghát, Khasia hills, and also at Nasmana, Kashmir region]
Remarks Benson based his original description on two specimens, a larger shell from Kashmir (Nasmana on the Chandrabhaga River), and a shell from Teria Ghat in the Khasi Hills, both of which were provided by William Theobald. Blanford and Godwin-Austen (1908: 149) thought that the Kashmir form was identical with *Euaustenia monticola* (L. Pfeiffer, 1849) and consequently listed it in the synonymy of that species. They also noted that the "obscure form" from Teria Ghat had not been recognized since its original discovery, leaving its taxonomic status unresolved. Only one syntype survives in the Benson collection. The other syntype might be one of the two Theobald collection shells, although it can no longer be identified. *Euaustenia monticola* is the type of *Euaustenia* Cockerell, 1891, originally introduced as Euausteniae (plural), a subgenus of *Austenia*. The corrected spelling was first used by Cockerill (1898: 10).

Genus *Cryptaustenia* Cockerell, 1891

Vitrina planospira Benson, 1859

Accepted as *Cryptaustenia succina* (Reeve, 1862);
Vitrina succina Reeve, 1862 [in 1859–1862]

Vitrina planospira Benson, 1859h: 271 (non Pfeiffer, 1853b); Pfeiffer, 1868 [in 1847–1877]: 14
Vitrina succina Reeve, 1862 [in 1859–1862], 13 (*Vitrina*): plate 2, species 8; Hanley and Theobald, 1873 [in 1870–1876]: 29, pl. 65, figs 7, 10
Austenia planospira (Benson); Godwin-Austen, 1883 [in 1882–1888]: 149, pl. 36, Figs 1–5 [animal and shell], Pl. 38, Figs 1, 1b [anatomy]; Godwin-Austen, 1899 [in 1897–1914]: 93, Pl. 91, Fig. 4 [dart-sac]
Cryptaustenia succinea (Reeve); Blanford and Godwin-Austen, 1908: 180, Fig. 63
Type material NHMUK 1906.1.1.12, **Fig. 78 D** (syntype from the W.T. Blanford collection labelled *Cryptaustenia succinea* Reeve, Darjiling Hills, W.T. Blanford")
Original measurements: "Diam. major 14, minor 11, axis 5 mill."
Other material UMZC I.104520 (single shell from the R. McAndrew collection labelled "*Vitrina Planospira* Bens., Bens. col., Darjiling". A second label, probably written by Hanley, reads "*Vitrina planospira* Bens. =*succinea* Rve figured in Conch. Ind.")
Type locality India: "Habitat ad Pankabari et in valle Rungun, Vitrinae Salii consors, raro occurrens" [lives at Pankabari and in the Rungun Valley, together with *Vitrina salius*, occurs rarely]
Remarks Benson based his original description on "two dead and imperfect specimens…collected by Mr. W.T. Blanford". With only a few exceptions, all of the type material described in Benson (1859h) was "contained in the Darjiling collections of Messrs. W.T. and H.F. Blanford". The Rungun valley is close to Darjiling and is therefore compatible with the type locality given for NHMUK 1906.1.1.12, which is a worn, dead shell that conforms to the original description. The fresh, undamaged UMZC specimen

from Benson's own collection was figured by Hanley and Theobald (1873 [in 1870–1876]). Benson's name is preoccupied by *Vitrina planospira* L. Pfeiffer, 1853 used for another taxon from "Salomon's Island". Reeve (1862) erected *Vitrina succina* as a replacement name, although subsequent authors have used *succinea* for the species name; this is an unjustified emendation. Benson's *V. planospira* is the type of *Cryptaustenia* Cockerell, 1891, originally proposed as a subgenus of *Austenia*; Cockerill's original spelling *Cryptoausteniae* (plural) has been corrected under Art. 32.5.2.7.

Genus *Rhyssotopsis* Ancey, 1887

Helix haughtoni Benson, 1863

Accepted as *Rhyssotopsis conferta* (L. Pfeiffer, 1857); *Helix conferta* Pfeiffer, 1857b: 328

Helix haughtoni Benson 1863a: 87; Hanley and Theobald, 1870 [in 1870–1876]: 14, Pl. 28, Fig. 3
Nanina (*Rhyssota*) *haughtoni* (Benson); Nevill, 1878: 46 (with brief description of animal)
Nanina (*Hemiplecta*) *haughtoni* (Benson); Tryon, 1886: 39, Pl. 17, Fig. 51
Type material UMZC I.104355, **Fig. 78 E** (one of two syntypes from the R. McAndrew collection labelled "*Nanina* (*Hemiplecta*) *Haughtoni* Bens., Bens. col., Andaman Ids")
Original measurements: "Diam. major 31, minor 27, axis 19 mill."
Type locality Andaman Islands: "Habitat in insulis Andamanicis. Detexit Major J.C. Haughton". [lives in the Andaman Islands. Discovered by Major J.C. Haughton]
Remarks Benson based his original description of this species on two specimens provided by Haughton. *Helix haughtoni* is the type of *Rhyssotopsis* Ancey, 1887. Blanford and Godwin-Austen (1908: 295) included this species in the synonymy of *Haughtonia conferta* (L. Pfeiffer, 1857) (= *Rhyssotopsis conferta*). This species is endemic to the Andaman Islands (Rao et al., 2013).

Family ARIOPHANTIDAE

Subfamily ARIOPHANTINAE

Genus *Ariophanta* Des Moulins, 1829

Ariophanta basilessa (Benson, 1865)

Helix basilessa Benson, 1865b: 11; Pfeiffer, 1868 [in 1847–1877]: 244; Hanley and Theobald, 1870 [in 1870–1876]: 13, Pl. 25, Fig. 2
Nanina (*Hemiplecta*) *basilessa* (Benson); Nevill, 1878: 47
Nanina basilessa (Benson); Tryon, 1886: 75, pl. 21, figs 9, 10
Ariophanta basilessa (Benson); Blanford and Godwin-Austen, 1908: 40; Raheem et al., 2014: 86, Fig. 52B–C
Cryptozona basilessa (Benson); Ramakrishna et al., 2010: 241
Type material UMZC I.103420.A, **Fig. 78 F** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 86, Fig. 52B) from the R. McAndrew collection labelled *Ryssota basilessa* Bens."; no locality data); UMZC I.103420.B, **Fig. 78 G** (paralectotype from the same lot)
Original measurements: "Diam. major. 48, minor 38, axis 21 mill."
Type locality India: "Habitat in montibus prope Cottyam regione Travancoria" [lives in the mountains near Coyttam in the region of Travancore]
Remarks The number of specimens provided by Francis Day was not mentioned in Benson's original description. This species is endemic to the Western Ghats, where it is only known from the southern parts (Raheem et al., 2014).

Ariophanta basileus (Benson, 1861)

Helix basileus Benson, 1861d: 81; 1862a: 414; 1864d: 496; Pfeiffer, 1868 [in 1847–1877]: 120; Pfeiffer 1876 [in 1847–1877]: 124; Hanley and Theobald, 1870 [in 1870–1876]: 13, Pl. 25, Fig. 7
Nanina (*Hemiplecta*) *basileus* (Benson); Nevill, 1878: 47
Nanina (*Rhysota*) *basileus* (Benson); Tryon, 1886: 31, Pl. 10, Fig. 36
Ariophanta basileus (Benson); Godwin-Austen, 1902: 248 (included within subgenus *Nilgiria*); Blanford and Godwin-Austen, 1908: 41, Fig. 23 [anatomy]; Raheem et al., 2014: 87, Figs 53A–C
Hemiplecta basileus (Benson); Ramakrishna et al., 2010: 248
Type material UMZC I.103430.A, **Fig. 79 A** (holotype from the R. McAndrew collection labelled by Benson "*Helix basileus* Bens. type, Nellyampatly, 50 m E. of Trichoor, Lieut. G.W. Cox"); UMZC I.103430.B, **Fig. 79 B** (one of four shells from the same lot)
Original measurements: "Diam. major 72, minor 62, axis 36 mill.; apert. 38 mill. lata, 31 alta."
Type locality India: "Habitat in collibus prope Trichoor Indiae meridionalis" [lives in the hills near Trichoor, Eastern India]
Remarks This species was discovered by Lieut. G.W. Cox and forwarded to Benson by his son, Capt. Charles Annesley Benson. The number of specimens examined was not clearly stated in Benson's original description. However, in a subsequent paper he reported receiving another shell from Charles Benson that was "larger than the type-specimen described", collected by D. Kohlhoff from the "Travancore Hills behind Trevandrum" (Benson, 1862a: 414). He provided

further clarification in 1864, noting that his type series consisted of a single "gigantic shell" [i.e. a holotype] collected by Cox at "Nellyampatly, in a thick wood situated in an undulating country 3300 feet above the level of the sea, and fifty miles due east of Trichoor" (Benson, 1864d: 496–497). Benson's original label that was associated with the holotype survives (**Fig. 79 B**). Given that the species was based on a holotype specimen, the lectotype designation by Raheem and Naggs (Raheem et al., 2014: 87) is invalid.

Helix cyix Benson, 1860

Accepted as *Ariophanta bistrialis* (H. Beck, 1837); *Nanina bistrialis* Beck, 1837: 2

Helix cyix Benson, 1860b: 382; Hanley and Theobald, 1870 [in 1870–1876]: 14, Pl. 29, Fig. 4
Nanina cyix (Benson); Tryon, 1886: 84, Pl. 17, Fig. 44
Type material UMZC I.104315.A, **Fig. 79 C** (one of two syntypes from the R. McAndrew collection labelled "*Nanina Cyix* Bens., Bens. col., Ceylon")
Original measurements: "Diam. major 23, minor 20, axis 15 mill."
Other material UMZC I.104310 (three shells from the R. McAndrew collection, no collection or locality data)
Type locality Sri Lanka: "Habitat in pago Matelle" [lives in the district of Matelle]
Remarks The number of specimens provided by Frederick Layard was not noted in Benson's original description. Blanford and Godwin-Austen (1908: 39) tentatively listed this species in the synonymy of *Ariophanta bistrialis* (H. Beck, 1837), noting that it "is a dwarf form, rather globose, generally with the colour-lines faint or wanting..."

Ariophanta ceraria (Benson, 1853) [60]

Helix ceraria Benson, 1853c: 91; Reeve, 1854 [in 1851–1854], 7 (*Helix*): pl. 186, species 1291; Pfeiffer, 1859 [in 1847–1877]: 67; Hanley and Theobald, 1870 [in 1870–1876]: 14, Pl. 28, Fig. 4
Nanina (*Hemiplecta*) *ceraria* (Benson); Tryon, 1886: 41, Pl. 13, Fig. 82
Ariophanta ceraria (Benson); Blanford and Godwin-Austen, 1908: 37
Type material UMZC I.103955.A–B, **Figs. 79 E–F** (two syntypes from the R. McAndrew collection labelled "*Nanina Ceraria* Bens., Bens. col.", no locality data)
Original measurements: "Diam. major 20, minor 16, alt. 10 mill."
Other material NHMUK 1912.8.16.316–318 (three shells from the E.L. Layard collection labelled "*H. ceraria* Bs., Horton Plains, Ceylon")
Type locality Sri Lanka: "Hab. in agris altis Insulae Ceylon "Horton Plains" dictis" [lives in the highlands of the Island of Ceylon known as "Horton Plains"]
Remarks The number of specimens provided by Edgar Layard was not noted in Benson's original description. The UMZC specimens are both juvenile shells with 4 whorls, matching the number described by Benson. The largest specimen also broadly agrees with the dimensions cited by Benson but is noticeably smaller in maximum diameter.

Ariophanta cysis (Benson, 1852)

Helix cysis Benson, 1852a: 404; as *cystis*, Reeve, 1852 [in 1851–1854], 7 (*Helix*): pl. 123, species 737; Pfeiffer, 1853 [in 1847–1877]: 92; Pfeiffer, 1859 [in 1847–1877]: 174; Pfeiffer, 1876 [in 1847–1877]: 277; Hanley and Theobald, 1870 [in 1870–1876]: 13, Pl. 25, Fig. 5; Godwin-Austen, 1883 [in 1882–1888]: 139
Nanina (*Oxytes*) *cysis* (Benson); Blanford, 1863b: 85
Nanina (*Ariophanta*) *cysis* (Benson); Nevill, 1878: 19; Tryon, 1886: pl. 1, figs 7, 8
Ariophanta cysis (Benson); Blanford and Godwin-Austen, 1908: 33; Ramakrishna et al., 2010: 238; Raheem et al., 2014: 91, Fig. 56A–C
Type material UMZC I.103895.A, **Fig. 80 A** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 91, Fig. 56A) from the R. McAndrew collection labelled "*Ariophanta Cysis* Bens., Bens. col., Jerdon, So. Ind." [South India]); UMZC I.103895.B, **Fig. 80 B** (one of two paralectotypes from the same lot)
Original measurements: "Diam. major 43, minor 35, alt. 23 mill."
Type locality India: "Hab. in Montibus Nilgherries Indiae Australis. Teste Jerdon" [lives in the Nilgiri Hills of southern India according to Jerdon]
Remarks The number of specimens provided by Thomas Jerdon was not noted in Benson's original description. Nevill (1878: 19) listed a single specimen labelled "Nilgiris; coll. Dr. Jerdon, ex c. As. Soc. Bengal" in the Indian Museum, although there is no evidence this shell is part of the type series. According to Blanford and Godwin-Austen (1908: 33) the typical form of this species occurred "on the western side of the Nilgiris (Sispara)".

Ariophanta interrupta (Benson, 1834)

Helix interrupta Benson, 1834a: 90; Benson, 1835d: 461; Pfeiffer, 1847 [in 1847–1877]: 63; Reeve, 1853 [in 1851–1854], 7 (*Helix*): pl. 171, species 1159; Hanley and Theobald, 1870 [in 1870–1876]: 13, Pl. 27, Fig. 3
Nanina (*Ariophanta*) *interrupta* (Benson); Blanford, 1863b: 85

Ariophanta interrupta (Benson); Godwin-Austen, 1898 [in 1897–1914]: 130, Pl. 34, Fig. 2; Blanford and Godwin-Austen 1908: 31; Ramakrishna et al., 2010: 238; Raheem et al., 2014: 92–93, figs 56F and 57A–C

Type material UMZC I.102100.A, **Fig. 80 C** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 92–93, Fig. 56F) from the R. McAndrew collection labelled "*Ariophanta Interrupta* Bens., Bens. col., Ind."); UMZC I.102100.B, **Fig. 80 D** (one of six paralectotypes from the same lot)

Original measurements: none given

Other material NHMUK 1954.6.2.297 (single shell from the J.S. Hawkins collection labelled "*Helix interrupta* Benson, ?Paratype, Bahar, W.H. Benson 1862")

Type locality India: "obtained near Sicrigali [Sakrigali] and the river Jellinghy [Jalangi], one of the mouths of the Ganges"

Remarks The number of specimens examined was not noted in Benson's original description. In a later paper (Benson 1863a: 88), he mentioned "a single dead and imperfect specimen of *H. interrupta*" collected in Darjiling by William Theobald, which he presumed to have been thrown away by Dr J.T. Pearson "who had also collected this shell, which I discovered in 1831". The specimen from the J.S. Hawkins collection, which originated from Benson, is not from the type locality and is not considered part of the type series. This species is restricted to the Indian subcontinent with a range centred on East India (Raheem et al., 2014); it has recently been recorded from Bhutan (Gittenberger et al., 2017a).

Ariophanta laidlayana (Benson, 1856)

Helix laidlayana Benson, 1856f: 253; Pfeiffer, 1859 [in 1847–1877]: 31; Pfeiffer, 1876 [in 1847–1877]: 96; Hanley and Theobald, 1872 [in 1870–1876]: 27, Pl. 58, Fig. 3

Nanina (*Ariophanta*) *laidlayana* (Benson); Blanford, 1863b: 85; Nevill, 1878: 18; Tryon, 1886: 15, pl. 1, figs 3, 4, 5

Ariophanta laidlayana (Benson); Godwin-Austen, 1883 [in 1882–1888]: 140, Pl. 34, Fig. 3; Blanford and Godwin-Austen, 1908: 30; Ramakrishna et al., 2010: 239

Type material UMZC I.102860, **Fig. 79 D** (one of two syntypes from the R. McAndrew collection labelled "*Ariophanta Laidlayana* Bens., Bens. col., Cuttack"); UMZC I.102855 (two syntypes from the R. McAndrew collection labelled "*Ariophanta Laidlayana* Var. Bens., Bens. col., Cuttack")

Original measurements: "Diam. major 27, minor 23, axis 15 mill. Apert. 15 mill. lata, 13½ alta."

Type locality India: "in Provincia Bengalensi Bheerbhoom, ubi exemplum unicum junius detexit J.W. Laidlay; nuperrime in Provincia Orissae, non procul ab urbe Cuttack, exempla majora non raro invenit W. Theobald." [lives at Bheerbhoom in Bengal Province, where J.W. Laidlay found a unique example of a juvenile; nearby in the Orissa Province, not far from the town of Cuttack, W. Theobald found plentiful mature examples]

Remarks Benson's original description was based on several specimens collected by Laidlay and Theobald, although adult shells were then only known from Cuttack.

Ariophanta solata (Benson, 1848)

Helix solata Benson, 1848b: 159; Reeve, 1852 [in 1851–1854], as *soluta*, 7 (*Helix*): pl. 124, species 741; Pfeiffer, 1853 [in 1847–1877]: 67; Pfeiffer, 1859 [in 1847–1877]: 170; Pfeiffer, 1876 [in 1847–1877]: 274; Hanley and Theobald, 1870 [in 1870–1876]: 14, Pl. 28, Fig. 6

Nanina (*Hemiplecta*) *solata* (Benson); Blanford, 1863b: 84

Nanina (*Xesta*) *solata* (Benson); Nevill, 1878: 50

Nanina solata (Benson); Tryon, 1886: 80, Pl. 23, Fig. 45

Ariophanta solata (Benson); Blanford and Godwin-Austen, 1908: 46, Fig. 26 (anatomy); Raheem et al., 2014: 95–96, Figs 58F and 59A–B

Cryptozona solata (Benson); Ramakrishna et al., 2010: 243

Type material UMZC I.102420.A, **Fig. 80 E** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 95–96, Fig. 58F) from the R. McAndrew collection labelled "*Nanina (Rhyssota) Solata* Bens., Bens. col., Nilgherries"); UMZC I.102420.B, **Fig. 80 F** (one of four paralectotypes from the same lot)

Original measurements: "Diam. major 23 mill., minor 18. Axis 11 mill."

Other material UMZC I.102415 (R. McAndrew collection labelled "*Ryssota Solata* Var., Bens. col., Bengal", although the locality was subsequently crossed out)

Type locality India: "Hab. montibus Nilgherries Indiae meridionalis." [lives in the Nilgiri Hills of southern India]

Remarks Benson mentioned that he had seen at least two specimens at the time of his original description, one or more collected by Jerdon from the Nilgherries and a larger, poorly preserved specimen from the same locality, presumably in his own collection. Godwin-Austen (1888: 253) designated *solata* as the type of *Nilgiria* Godwin-Austen, 1888, only mentioning the name and the type, and only later did he provide a diagnosis (Godwin-Austen, 1898 [in 1897–1914]: 77). *Nilgiria* is now regarded as a synonym of *Ariophanta* Des Moulins, 1829.

Ariophanta thyreus (Benson, 1852)

Helix thyreus Benson, 1852a: 405; Reeve, 1852 [1851–1854], 7 (*Helix*): pl. 123, species 735; Pfeiffer, 1853 [in 1847–1877]: 251; Pfeiffer, 1876 [in 1847–1877]: 454; Hanley and Theobald, 1870 [in 1870–1876]: 13, Pl. 27, Fig. 6
Nanina (*Oxytes*) *thyreus* (Benson); Blanford, 1863b: 85
Nanina (*Ariophanta*) *thyreus* (Benson); Nevill, 1878: 19; Tryon, 1886: Pl. 1, Fig. 6
Ariophanta thyreus (Benson); Blanford and Godwin-Austen, 1908: 34, Fig. 20; Ramakrishna et al., 2010: 240; Raheem et al., 2014: 96, Figs 59C–E
Type material UMZC I.103905.A, **Fig. 81 A** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 96; Fig. 59C) from the R. McAndrew collection labelled "*Nanina* (*Ariophanta*) *Thyreus* Bens., Bens. col., So. India" [South India]); UMZC I.103905.B, **Fig. 81 B** (one of two paralectotypes from the same lot); UMZC I.103910 (paralectotype from the R. McAndrew collection labelled "*Ariophanta Ryssolemma* Alb *Thyreus* Bens. Var., Bens. col.", no locality data)
Original measurements: "Diam. major 34, minor 29, alt. 16 mill."
Type locality India: "Hab. in India Australi. Teste Jerdon" [lives in southern India according to Jerdon]
Remarks The number of specimens provided by Thomas Jerdon was not noted in Benson's original description. This species is endemic to the Western Ghats (Raheem et al., 2014).

Genus *Hemiplecta* Albers, 1850

Hemiplecta ? *gordoniae* (Benson, 1863)

Helix Gordoniae Benson, 1863a: 87; Pfeiffer, 1868 [in 1847–1877]: 402; Hanley and Theobald, 1870 [in 1870–1876]: 13, pl. 27, figs 1, 2
Nanina (*Hemiplecta*) *gordoniae* (Benson); Tryon, 1886: 45, pl. 15, figs 3, 4
Hemiplecta ? *gordoniae* (Benson); Blanford and Godwin-Austen, 1908: 293
Type material UMZC I.103415, **Fig. 81 C** (syntype from the R. McAndrew collection labelled "*Polygyra*? *Gordoniae* Bens., Bens. col., Moulmein", here designated as the lectotype)
Original measurements: "Diam. major 33, minor 30, axis 11 mill."
Other material NHMUK 1954.6.2.295, **Fig. 81 D** (single shell from the J.S. Hawkins collection, obtained from Robert Gordon, labelled "*Helix gordoniae* Benson, Paratype, Birmanica near Moulmein, W.H. Benson 1863")
Type locality Burma: "in regione Birmanica prope Moulmein" [in the region of Burma near Moulmein]
Remarks Benson's original description was based on two shells: "Two specimens of this beautiful and delicate species, one of which was imperfect, were kindly sent to me from Moulmein by Mrs. Gordon, wife of Major-General Gordon, of the Madras Army, with other shells previously found in that neighbourhood" (Benson, 1863a: 87). Robert Gordon later corresponded with J.S. Hawkins and provided additional details relating to the discovery of the original shells in a manuscript list of specimens from Moulmein that accompanied a letter dated 9th May 1863 (ZOO MSS_HAW): "Only 6 specimens were picked up. One I gave to the Governor of Madras, the two described by Mr. Benson were given by me to Mrs. Gordon, who sent them to Mr. B. I am sorry I have not a better sp. to offer you [Hawkins] – a full sized shell is as large as a half crown in circumference and covered with a delicate yellow epidermis". NHMUK 1954.6.2.295 was clearly given to Hawkins by Gordon and is therefore not part of the type series, despite the claim on the label. Compounding the potential for confusion, the year of description corresponds with one of Benson's dated donations to Hawkins, but the manuscript list documenting this transfer of material (ZOO_MSS_HAW) does not include this species.

Hemiplecta ? *textrina* (Benson, 1856)

Helix textrina Benson, 1856f: 252; Theobald, 1857: 249; Pfeiffer, 1859 [in 1847–1877]: 58; Pfeiffer, 1860 [in 1854–1869], 1: 131, pl. 36, figs 5–7; Hanley and Theobald, 1872 [in 1870–1876]: 24, pl. 52, figs 2, 5
Nanina (*Macrochlamys*) *textrina* (Benson); Blanford, 1863b: 83; Blanford, 1865: 87
Nanina textrina (Benson); Nevill, 1878: 32
Macrochlamys textrina (Benson); Godwin-Austen, 1883 [in 1882–1888]: Pl. 21, Fig. 37
Nanina (*Xestina*) *textrina* (Benson); Tryon, 1886: 83, pl. 16, figs 23, 24
Hemiplecta ? *textrina* (Benson); Blanford and Godwin-Austen, 1908: 292; Ramakrishna et al., 2010: 249
Type material UMZC I.103245.A, **Fig. 81 E** (one of two syntypes from the R. McAndrew collection labelled "*H. texturina* [sic] Bens., Bens. col.", no locality data)
Original measurements: "Diam. major 29, minor 25, axis vix 13 mill. Apert. 15 mill. lata, 10 alta."
Other material NHMUK 1888.12.4.1481, **Fig. 81 F** (one of three shells from the W. Theobald collection labelled "*H.* (*Macrochlamys*) *textrina* Benson, Pegu, 1 small - 2 typical")
Type locality Burma: "ad Thyet Myo. Detexit W. Theobald" [at Thyet Myo. Discovered by W. Theobald]

Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. Theobald (1857: 249) later noted that the species was found at "Henzada" [Hinthada] where it was "Common in jungle. The adult shell has a very handsome pellucid appearance. In the rains the foot is too large for immediate retraction".

Genus *Indrella* Godwin-Austen, 1901

Indrella ampulla (Benson, 1850)

Helix ampulla Benson, 1850a: 213; Reeve, 1852 [in 1851–1854], 7 (*Helix*): pl. 123, species 736; Pfeiffer, 1853 [in 1847–1877]: 27; Pfeiffer, 1859 [in 1847–1877]: 9; Hanley and Theobald, 1870 [in 1870–1876]: 13, Pl. 25, Fig. 4
Nanina (*Helicarion*?) *ampulla* (Benson); Blanford, 1863b: 84
Nanina ampulla (Benson); Nevill, 1878: 54
Ariophanta (*Indrella*) *ampulla* (Benson); Godwin-Austen, 1901: 187
Indrella ampulla (Benson); Blanford and Godwin-Austen, 1908: 49, Fig. 27 [anatomy], Fig. 28 [shell]; Ramakrishna et al., 2010: 249; Raheem et al., 2014: 97, Fig. 60A–C
Type material UMZC I.103585.A, **Fig. 82 A** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 97, Fig. 60A) from the R. McAndrew collection labelled "*Nanina ampulla* Bens, Bens. col., Ind."); UMZC I.103585.B, **Fig. 82 B** (paralectotype from the same lot)
Original measurements: "Diam. maj. 42 mill., minor 31 mill., axis 30 mill."
Type locality India: "Hab. Khoorda Ghat, in montibus Nilghiri dictis, Indiae Meridionalis. Teste Jerdon" [lives at Khoorda Ghat, in the Nilgiri Hills, Southern India according to Jerdon]
Remarks The number of specimens provided by Thomas Jerdon was not noted in Benson's original description. This is the type species of *Indrella* Godwin-Austen, 1901, which is endemic to the Western Ghats, where it has a wide geographical and altitudinal range (Raheem et al., 2014).

Genus *Euplecta* C. Semper, 1870

Euplecta acuducta (Benson, 1850)

Helix acuducta Benson, 1850a: 214; Reeve, 1852 [in 1851–1854], 7 (*Helix*): pl. 124, species 739; Pfeiffer, 1853 [in 1847–1877]: 78; Pfeiffer, 1859 [in 1847–1877]: 67; Hanley and Theobald 1872 [in 1870–1876]: 23, Pl. 50, Fig. 5
Nanina acuducta (Benson); Nevill, 1878: 29
Nanina (*Hemiplecta*) *acuducta* (Benson); Tryon, 1886: 40, Pl. 13, Fig. 81
Euplecta acuducta (Benson); Blanford and Godwin-Austen 1908: 67, Fig. 36; Ramakrishna et al., 2010: 244; Raheem et al., 2014: 98, Fig. 60D
Type material UMZC I.103645, **Fig. 82 C** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 98) from the R. McAndrew collection labelled "*Thea Acuductus* Bens., Bens. col.", no locality data)
Original measurements: "Diam. major 22, minor 19, alt. 11 mill."
Type locality India: "Hab. in sylvis ad apicem montium Nilgheries, Indiae meridionalis. Jerdon" [lives in woodland at the peaks of the Nilgiri Hills, Southern India. Jerdon]
Remarks The number of specimens provided by Thomas Jerdon was not noted in Benson's original description. Blanford and Godwin-Austen (1908: 67) stated that "The type of *E. acuducta*, now in Cambridge, is immature; it only differs from *E. koondaensis* in having rather flatter whorls and a sharper keel (both characters due partly to immaturity) and in having the last whorl slightly broader." Raheem et al. (2014) noted that their proposed lectotype had a broken lip, a feature not mentioned by Benson or shown in Reeve's figure of Benson's type (Reeve, 1852 [in 1851–1854]: Pl. 124, Fig. 739). They also noted NHM specimens from "Ceylon" purporting to be this species but this material was apparently misidentified (see Raheem et al., 2014: 98).

Euplecta ? *baconi* (Benson, 1850)

Helix baconi Benson, 1850b: 251; Reeve, 1853 [in 1851–1854], 7 (*Helix*): pl. 172, species 1166; Pfeiffer, 1853 [in 1847–1877]: 55; Pfeiffer, 1853 [in 1853–1854], 1(12_3), 378, pl. 141, figs 11–12; Hanley and Theobald, 1872 [in 1870–1876]: 26, Pl. 56, Fig. 7
Nanina (*Sitala* ?) *baconi* (Benson); Nevill, 1878: 35; Tryon, 1886: 59, Pl. 26, Fig. 44
Euplecta ? *baconi* (Benson); Blanford and Godwin-Austen, 1908: 56; Ramakrishna et al., 2010: 244
Type material UMZC I.103700, **Fig. 82 D** (holotype from the R. McAndrew collection labelled "*Nanina Baconi* Bens., unique, Bens. col.")
Original measurements: "Diam. major 14, minor 13, axis 7 mill"
Type locality India: "Hab. rarissime in agris Rohillanis, prope urbem Moradabad Indiae Septentrionalis" [lives very rarely in the country around Rohilla, near the town of Moradabad, Northern India]
Remarks Benson's original description was based on one shell: "A single specimen was taken alive, during the rains of 1843, in a bush on the bank of the Gungun River, near Moradabad, by my friend Dr. J.F. Bacon."

Hanley and Theobald (1872 [in 1870–1876]) and later William Blanford, in his manuscript notes for the *FBI*, thought that the type of *baconi* was an immature shell of *Helix subdecussata* L. Pfeiffer but Godwin-Austen disagreed. A detailed discussion about the identity of *Helix baconi* was provided by Blanford and Godwin-Austen (1908: 53–56), where its specific separation is provisionally retained, together with its tentative attribution to *Euplecta.*

Euplecta cacuminifera (Benson, 1850)

Helix cacuminifera Benson, 1850a: 214; Reeve, 1852 [in 1851–1854], 7 (*Helix*): pl. 3, species 12; Pfeiffer, 1853 [in 1847–1877]: 36; Pfeiffer, 1859 [in 1847–1877]: Pfeiffer, 1876 [in 1847–1877]: 103; Hanley and Theobald, 1872 [in 1870–1876]: 25, Pl. 54, Fig. 2
Nanina (*Trochomorpha*) *cacuminifera* (Benson); Blanford, 1863b: 84
Nanina cacumenifera [sic] (Benson); Tryon, 1886: 57, Pl. 26, Fig. 36
Euplecta cacuminifera (Benson); Blanford and Godwin-Austen, 1908: 68; Ramakrishna et al., 2010: 245; Raheem et al., 2014: 99, Fig. 62B–C
Type material UMZC I.103600.A, **Fig. 82 E** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 99, Fig. 62B) from the R. McAndrew collection labelled "*Trochomorpha Cacuminifera* Bens., Bens col." with "Nilgherries" added in pencil); UMZC I.103600.B, **Fig. 82 F** (paralectotype from the same lot)
Original measurements: "Diam. major 19, minor 16, axis 10 mill."
Type locality India: "Hab. in cacuminibus montium Nilgheries, teste Jerdon" [lives on the peaks of the Nilgiri Hills, according to Jerdon]
Remarks The number of specimens provided by Thomas Jerdon was not noted in Benson's original description. This species is endemic to the Western Ghats, where it has been identified from the Nilgiri Hills ("Sispara") in the central Western Ghats (Raheem et al., 2014: 99).

Helix cingalensis Benson, 1860

Accepted as *Euplecta semidecussata* (L. Pfeiffer, 1853); *Helix semidecussata* Pfeiffer, 1853c: 252

Helix cingalensis Benson, 1860b: 383; Hanley and Theobald, 1872 [in 1870–1876]: 25, pl. 54, figs 1, 2
Nanina (*Sitala* ?) *cingalensis* (Benson); Nevill, 1878: 35
Nanina cingalensis (Benson); Tryon, 1896: 58, Pl. 26, Fig. 43
Type material UMZC I.103520, **Figs 83 A–B** (two syntypes from the R. McAndrew collection labelled "*Nanina Cingalensis* Bens., Bens. col., Ceylon")
Original measurements: "Diam. major 17, minor 15, axis 9 mill."
Type locality Sri Lanka: "Habitat in pago Matelle" [lives in the district of Matelle]
Remarks The number of specimens provided by Frederick Layard was not noted in Benson's original description. Blanford and Godwin-Austen (1908: 61) included this species in the synonymy of *Euplecta emiliana* (L. Pfeiffer, 1853) but examination of an extensive series of specimens and the relevant type/historical material indicates that *H. cingalensis* is a junior synonym of *Euplecta semidecussata* (L. Pfeiffer, 1853).

Helix marcida Benson, 1853

Accepted as *Euplecta partita* (L. Pfeiffer, 1854); *Helix partita* Pfeiffer, 1854d: 125

Helix marcida Benson, 1853c, 12: 92 (non Shuttleworth, 1852: 291)
Type material not located
Original measurements: "Diam. major 14, minor 12, axis 8 mill."
Other material NHMUK 1912.8.16.300, **Fig. 83 D** (one of three shells from the E.L. Layard collection labelled "*Helix marcida* Bs., Ceylon")
Type locality Sri Lanka: "Insula Ceylon" [Island of Ceylon]
Remarks The number of specimens provided by Edgar Layard was not noted in Benson's original description. Since Benson's name of 1853 is preoccupied, the next available name is Pfeiffer's *Helix partita* published the following year (Blanford and Godwin-Austen, 1908: 65).

Helix rosamonda Benson, 1860

Accepted as *Euplecta semidecussata* (L. Pfeiffer, 1853); *Helix semidecussata* Pfeiffer, 1853c: 252

Helix rosamonda Benson, 1860b: 381; Pfeiffer, 1868 [in 1847–1877]: 77; Hanley and Theobald, 1872 [in 1870–1876]: 27, pl. 59, figs 5, 6
Nanina rosamonda (Benson); Nevill, 1878: 29
Nanina (*Hemiplecta*) *rosamonda* (Benson); Tryon, 1886: 37, Pl. 12, Fig. 57
Euplecta rosamonda (Benson); Blanford and Godwin-Austen, 1908: 58
Type material UMZC I.103526.A, **Fig. 83 E** (one of two syntypes from the R. McAndrew collection labelled "*Hemiplecta Rosamonda* Var., Bens. col., Ceylon"); UMZC I.103527, **Fig. 83 F** (syntype from the R. McAndrew collection labelled "*Hemiplecta Rosamonda* Var., Bens. col., Ceylon")

Original measurements: "Diam. major 37, minor 33, axis 24 mill.; apert. longa 19, lata 20 mill."
Other material UMZC I.103525 (two shells from the R. McAndrew collection labelled "*Helix Rosamonda* Benson, Ceylon", no collection data); NHMUK 20160375 (three shells from the V. McAndrew collection labelled "Matelle" [Sri Lanka])
Type locality Sri Lanka: "Habitata ad Pittewelle, pagi Matelle orientalis" [lives at Pittewelle, eastern Matelle district]
Remarks The number of specimens provided by Frederick Layard was not noted in Benson's original description. Nevill (1878: 29) listed a specimen in the Indian Museum labelled "Laggale (Matelle), in Ceylon (typical); ex c. E.L. Layard, Esq.". Blanford and Godwin-Austen (1908: 58) discussed measurements of one of the specimens in the UMZC: "Major diam. 37, min. 33, axis 24 mm., according to Benson, but the figure in Hanley measures: major diam. 36, axis 27; and there is one specimen with these dimensions in the McAndrew Collection at Cambridge". It seems that the latter reference is to UMZC I.103527. The three shells in the NHM are a better fit to Benson's description, but are just slightly smaller overall. Benson might have been the source of these shells but there is no documentation to support this suggestion. According to Blanford and Godwin-Austen (1908: 58) this species is probably a turbinate form of *Euplecta semidecussata* (L. Pfeiffer, 1853).

Euplecta travancorica (Benson, 1865)

Helix travancorica Benson, 1865b: 13; Pfeiffer, 1868 [in 1847–1877]: 130; Hanley and Theobald, 1872 [in 1870–1876]: 24, Pl. 50, Fig. 6, pl. 149, Fig. 7
Nanina travancorica (Benson); Nevill, 1878: 29
Nanina (*Hemiplecta*) *travancorica* (Benson); Tryon, 1886: 41, pl. 13, Fig. 78
Euplecta travancorica (Benson); Blanford and Godwin-Austen, 1908: 58, Fig. 32; Ramakrishna et al., 2010: 248; Raheem et al., 2014: 103–104, Figs 65E–F
Type material UMZC I.103530.A, **Fig. 84 A** (holotype from the R. McAndrew collection labelled "*Nanina Travancorica* Var.? Bens., Bens. col.", no locality data)
Original measurements: "Diam. major 29, minor 23, axis 15 mill. Apert. lat. 15, alt. 14 mill."
Other material UMZC I.103530.B, **Fig. 84 B** (single shell from the R. McAndrew collection labelled "*Nanina Travancorica*, Bens., Bens. col., Travancore" and a later label in other handwriting reads: "TYPE, fide W.T. Blanford May, 1901", but see below)
Type locality India: "Habitat in montibus Travancoricis non procul a Cottyam. Teste D. Kohlhoff" [lives in the Travancore mountains not far from Cottyam according to D. Kohlhoff]
Remarks Benson based his description on one shell: "A single specimen of this shell, with the surface in perfect condition, but with an injured aperture, was obtained with my most gigantic one of *Helix Basileus*". UMZC I.103530.A has a damaged aperture and closely matches Benson's description and published measurements (see Raheem et al., 2014: 103–104). Blanford and Godwin-Austen (1908: 59) mentioned a "type" specimen in the UMZC (now registered as UMZC I.103530.B), identified as such by W.T. Blanford (see above), but this is a completely intact shell and cannot be Benson's damaged holotype. *Euplecta praeeminens* Sykes, 1898 is a junior synonym.

Genus *Khasiella* Godwin-Austen, 1899

Khasiella ? *chloroplax* (Benson, 1865)

Helix chloroplax Benson, 1865b: 14; Pfeiffer, 1868 [in 1847–1877]: 80; Hanley and Theobald, 1870 [in 1870–1876]: 15, pl. 32, figs 1 and 4
Nanina chloroplax (Benson); Nevill, 1878: 33
Helix (*Patula*) *chloroplax* Benson; Tryon, 1887: 74, pl. 14, figs 97–98
Khasiella? *chloroplax* (Benson); Blanford and Godwin-Austen, 1908: 165; Ramakrishna et al., 2010: 296
Type material UMZC I.103260, **Fig. 84 C** (holotype from the R. McAndrew collection labelled "*Nanina Chloroplax* Bens., Bens. col., Simla")
Original measurements: "Diam. vix 8, axis 4 mill."
Type locality India: "in montibus Himalayanis prope Simla" [in the Himalayan mountains near Simla]
Remarks Benson based his original description on a single shell provided by William Theobald. The dimensions of UMZC I.103260 match those given by Benson, but the shell does not seem fully grown. It has a depressed, greenish shell with a slight peripheral angulation, distinguishing from the taller-spired, brown shells determined as this species from Muree and mentioned by Blanford and Godwin-Austen (1908: 165).

Khasiella climacterica climacterica (Benson, 1836)

Helix climacterica Benson, 1836a: 352; Pfeiffer, 1848 [in 1847–1877]: 163; Pfeiffer, 1853 [in 1847–1877]: 170; Benson, 1859f: 163; Pfeiffer, 1876 [in 1847–1877]: 302; Reeve, 1852 [in 1851–1854], 7 (*Helix*): pl. 124, species 742, figs a, b; Benson, 1859f: 392; Hanley and Theobald, 1872 [in 1870–1876]: 26, pl. 55, figs 4, 5
Nanina climacterica (Benson); Nevill, 1878: 30
Nanina (*Rotula*) *climacterica* (Benson); Tryon, 1886: 23, pl. 4, figs 68, 69

Khasiella climacterica (Benson); Blanford and Godwin-Austen, 1908: 160; Ramakrishna et al., 2010: 297
Type material UMZC I.102025.A, **Fig. 84 D** (holotype from the R. McAndrew collection labelled "*Videna Climacterica* Bens., Bens. col., Teria Ghat")
Original measurements: "Diam. 0.75 poll." [Benson, 1836]; "Diam. maj. 19 mill., minor 18. Axis 9 mill." [Benson, 1859f]
Other material UMZC I.102025.B (second shell from the holotype lot); UMZC I.105260 (single shell from the R. McAndrew collection labelled "*Videna Climacterica* Bens. Var., Bens. col., Pegu"); NHMUK 1879.12.26.52–55 (four shells, one of which is missing, presented by the India Museum labelled "*H. climacterica* Benson, Khasi Hills")
Type locality Bangladesh: part of a collection "chiefly made in the hills on the N.E. Frontier of Bengal".
Remarks The number of specimens examined was not noted in Benson's original description, which was based on a collection acquired by the Asiatic Society from an expedition to "Sylhet, Cherra Poonji and the Khasi Hills" (Pearson, 1833). Benson (1859f: 392) later mentioned that his "original specimen was decorticate", indicating that the species was founded on a single worn shell; UMZC I.102025.A matches this description and Benson's published measurements (0.75 poll. = 19 mm). The three surviving NHM specimens from the India Museum, which originated from the Asiatic Society collection, are smaller. Nevill (1878: 30) listed another lot of three shells labelled "Teria Ghât (types); ex c. As. Soc. Bengal" in the Indian Museum, now presumably in the ZSI. This specific locality was not mentioned by Benson until he received additional specimens from Theobald over 20 years later (Benson, 1859f: 392), of which UMZC I.102025.B might also be an example. The identity of UMZC I.105260 is unclear, but since it is the only specimen labelled as a variety it might represent *H. climacterica nana* (see below). Ramakrishna et al. (2010) recorded *Khasiella climacterica* from several regions of India (Arunachal Pradesh, Assam, Meghalaya, Mizoram, Nagaland) and also from Burma.

Khasiella climacterica nana **Benson, 1859** comb. nov.

Helix climacterica ? nana Benson, 1859e: 392
Type material not located
Original measurements: "Diam. major 15, minor 14, axis 8 mill."
Type locality none given
Remarks Benson based his very brief description on a single weathered specimen, presumably from amongst the specimens of *K. climacterica* provided by William Theobald from "Teria Ghát" (see previous entry), although this is not made clear. Benson was reticent about its distinctness, but nevertheless this is an available name. The identity of his holotype is unclear; UMZC I.105260 is the only Benson collection specimen labelled as a variety, but there is no mention of Pegu as a type locality in the original description of his var. *nana*. Nevill (1878: 30) suggested that "var. *vidua*" in Conch. Indica might be the same as Benson's var. *nana.*

Khasiella hyba **(Benson, 1861)**

Helix hyba Benson, 1861d: 83; Pfeiffer, 1868 [in 1847–1877]: 181; Hanley and Theobald, 1870 [in 1870–1876]: 15, pl. 30, figs 2, 3
Trochomorpha hyba (Benson); Theobald, 1878: 143
Khasiella hyba (Benson); Godwin-Austen, 1907: 55; Blanford and Godwin-Austen, 1908: 162, Fig. 58; Ramakrishna et al., 2010: 298
Type material UMZC I.103435.A, **Fig. 85 C** (one of two syntypes from the R. McAndrew collection labelled "*Trochomorpha Hyba* Bens., Bens. col., Punjab" [see Appendix 2])
Original measurements: "Diam. major 14, minor 13, axis 7 mill."
Type locality India: "Habitat in montibus Sub-himalayanis, ad Dahinkhoond, non procul a fluvio Sutlej. Detexit J.D. Smithe" [lives in the Himalayan foothills, at Dahinkhoond, not far from the Sutlej River. Discovered by J.D. Smithe]
Remarks Benson's type series, provided by Smithe, included more than one specimen: "In one imperfect specimen, with a higher and more rounded hive-shaped spire, the keel of the penultimate whorl overhangs the anterior part of the last whorl" (Benson, 1861d: 83).

Khasiella ornatissima **(Benson, 1859)**

Helix ornatissima Benson, 1859h: 269; Pfeiffer, 1868 [in 1847–1877]: 113; Hanley and Theobald, 1872 [in 1870–1876]: 27, Pl. 60, Fig. 4
Nanina ornatissima (Benson); Nevill, 1878: 31
Euplecta ornatissima (Benson); Godwin-Austen, 1882: 70, Pl. 5, Fig. 8
Nanina (*Macrochlamys*) *ornatissima* (Benson); Tryon, 1886: 95, Pl. 32, Fig. 22
Khasiella ornatissima (Benson); Blanford and Godwin-Austen, 1908: 160; Ramakrishna et al., 2010: 298
Type material UMZC I.102500.A–B, **Figs 84 E–F** (two of five syntypes from the R. McAndrew collection labelled "*Nanina Ornatissima* Bens., Bens. col., Darjeerling")
Original measurements: "Diam. major 16, minor 14, axis 8 mill."

Type locality India: "Habitat ad Pankabari (1000 ped. alt.), prope Darjiling" [lives at Pankabari (altitude of 1000 feet), near Darjiling]

Remarks The number of specimens was not noted in the original description. In India this species has been identified from West Bengal, Sikkim (Blanford and Godwin-Austen, 1908) and Uttar Pradesh (Ramakrishna et al., 2010). It has also been recorded from Nepal (Budha et al., 2015).

Khasiella ? *pansa* (Benson, 1856)

Helix pansa Benson, 1856f: 252; Pfeiffer, 1859 [in 1847–1877]: 28; Pfeiffer, 1868 [in 1847–1877]: 79; Pfeiffer, 1860 [in 1854–1869], 1, 132: pl. 36, figs 11–13; Hanley and Theobald, 1872 [in 1870–1876]: 26, Pl. 56, Fig. 1

Nanina (*Macrochlamys*) *pansa* (Benson); Blanford, 1863b: 83; Tryon, 1886: 97, pl. 32, figs 51–53

Nanina pansa (Benson); Nevill, 1878: 28

Khasiella ? *pansa* (Benson); Blanford and Godwin-Austen, 1908: 161

Type material UMZC I.102970.A–B, **Figs 85 A–B** (two syntypes from the R. McAndrew collection labelled "*Trochomorpha Pansa* Bens., Bens. col., Burmah")

Original measurements: "Diam. major 14, minor 13, axis 6 ½ mill. Apert. 5 longa, 7 lata."

Type locality Burma: "Hab. ad Akaouktoung prope ripas Irawadi fluminis. Detexit W. Theobald" [lives at Akaouktoung near the banks of the Irawadi River. Discovered by W. Theobald]

Remarks The number of specimens provided by William Theobald was not noted in the original description. The two UMZC specimens are different, one being smaller with a more elevated spire and shallow sutures, the other being larger and more depressed. The sculpture of both is similar and they may demonstrate variability in this species. Nevill (1878: 28) listed a lot of two shells labelled "Burma; coll. W. Theobald, Esq." and another of 12 shells labelled "Prome and Thyet Myo; coll. Dr. J. Anderson and W. Theobald Esq." in the Indian Museum. This species has been identified from several localities in Burma, including the Irrawady Valley, Sullivan Island and the Mergui Archipelago (Blanford and Godwin-Austen, 1908). It has also been recorded from several regions of Nepal (Budha et al., 2015).

Khasiella serrula (Benson, 1836)

Helix serrula Benson, 1836a: 352; Pfeiffer, 1848 [in 1847–1877]: 206; Reeve, 1852 [in 1851–1854], 7 (*Helix*): pl. 85, species 461, figs a, b; Hanley and Theobald, 1872 [in 1870–1876]: 24, Pl. 50, Fig. 7

Nanina serrula (Benson); Nevill, 1878: 31

Nanina (*Rotula*) *serrula* (Benson); Tryon, 1886: 23, pl. 4, figs 63–65

Khasiella serrula (Benson); Blanford and Godwin-Austen, 1908: 162; Ramakrishna et al., 2010: 298

Type material UMZC I.102090.A, **Fig. 85 D** (one of three syntypes from the R. McAndrew collection labelled "*Trochomorpha Serrula* Bens., Bens. col., Bengal")

Original measurements: "Diam. 0.55 poll."

Original material NHMUK 1843.8.11.3–4 (two shells presented by W. Cracroft Esq. labelled "*serrula* Benson, Forests of Sylhet")

Type locality India/Bangladesh: part of a collection "chiefly made in the hills on the N.E. Frontier of Bengal"

Remarks The number of specimens examined was not noted in Benson's original description, which was based on material in the Museum of the Asiatic Society acquired from an expedition to "Sylhet, Cherra Poonji and the Khasi Hills" (Pearson, 1833). Nevill (1878: 31) listed a lot of five shells labelled "Sylhet (types); ex c. As. Soc. Bengal" in the Indian Museum, which is likely to form part of the type series. In India, Ramakrishna et al. (2010) reported this species from Arunchal Pradesh and Meghalaya.

Genus *Ratnadvipia* Godwin-Austen, 1899

Ratnadvipia? *edgariana* (Benson, 1853)

Vitrina edgariana Benson, 1853c: 93; Pfeiffer, 1859 [in 1847–1877]: 792

Helicarion edgarianus (Benson); Nevill, 1878: 15; Tryon, 1885: 179

Ratnadvipia? *edgariana* (Benson); Blanford and Godwin-Austen, 1908: 76

Type material not located

Original measurements: "Diam. major 10, minor 8, alt. 4 mill."

Type locality Sri Lanka: "Hab. ad Colombo, Hangwelle, et Ratnapoora, insuper folia arbustorum" [lives at Colombo, Hangwell and Ratnapoora, overhead in the leaves of trees]

Remarks The number of specimens provided by Edgar Layard, after whom this species was named, was not noted in Benson's original description. There must have been at least three, assuming one or more from each place included in the type locality. Blanford and Godwin-Austen (1908) provisionally placed this taxon in the genus *Ratnadvipia* purely on the basis of Benson's description since they had not been able to examine specimens. Raheem and Naggs (2006: 101) considered that, in view of Benson's rather unclear description and the fact that Benson's types cannot be

traced, *Vitrina edgariana* should be regarded as a *nomen dubium*.

Genus *Taphrospira* W.T. Blanford, 1905

Taphrospira convallata (Benson, 1856)

Helix convallata Benson, 1856f: 250; Pfeiffer, 1859 [in 1847–1877]: 46; Pfeiffer, 1860 [in 1854–1869], 1, 132: pl. 36, figs 14–16; Hanley and Theobald, 1874 [in 1870–1876]: 37, pl. 88, figs 2, 3
Nanina convallata (Benson); Nevill, 1878: 28
Nanina (*Macrochlamys*) *convallata* (Benson); Tryon, 1886: 93, pl. 31, figs 96, 97
Taphrospira convallata (Benson); Blanford and Godwin-Austen, 1908: 279
Type material a neotype (NHMUK 1888.12.4.2080, **Fig. 85 E**) is hereby designated from a series of two shells from the W. Theobald collection labelled "*Taphrospira convallata* Benson, Tenasserim"). We have designated a neotype with the express purpose of clarifying the taxonomic status of *T. convallata* (see below).
Original measurements: "Diam. major 14, minor 11½, axis vix 7 mill. Apert. lata 7, alt. 5 mill."
Other material UMZC I.102890.A, **Fig. 85 F** (one of four shells from the R. McAndrew collection labelled "*Nanina convallata* Bens., Bens. col., Andeman Ids"); NHMUK 1906.2.2.22 (two shells from the W.T. Blanford collection labelled "*Taphrospira convallata* Benson, Therabuin Hill, Tenasserim Valley")
Type locality Burma: "Hab. ad collem Therabuin vallis Tenasserim. Detexit W. Theobald" [lives at Therabuin Hill, Tenasserim Valley. Discovered by W. Theobald]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. The Benson collection specimens in the UMZC are not labelled as coming from the type locality, although it is possible that they have been mislabelled, since the species does not occur on the Andaman Islands (see Rao et al., 2013). In addition to its occurrence in Burma, this species has also been recorded from Nepal (Budha et al., 2015). This is the type species of *Taphrospira* W.T. Blanford, 1905 by original designation.

Subfamily TANYCHLAMYINAE

Genus *Burmochlamys* Pholyotha & Panha, 2022

Burmochlamys cassidula (Benson, 1859)

Helix cassidula Benson, 1859e: 186
Nanina cassidula (Benson); Nevill, 1878: 54
Hyalinia cassidula (Benson); Tryon, 1886: 177, Pl. 53, Fig. 68
Burmochlamys cassidula (Benson); Pholoyotha et al., 2022: 10
Type material UMZC I.104235, **Fig. 83 C** (syntype from the R. McAndrew collection labelled "*Conulus Cassidula* Bens., Bens. col., Moulmein")
Original measurements: "Diam. major 6, minor 5⅓, axis 4 mill."
Other material NHMUK 1888.12.4.464 (single shell from the W. Theobald collection labelled "*H.* (*Macrochlamys*) *cassidula* Benson, Moulmein")
Type locality Burma: "Habitat ad Moulmein, nec raro" [lives at Moulmein, but rarely]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. Theobald (1857: 249) had previously included Benson's manuscript name in his list of Burmese species without providing a description.

Burmochlamys cauisa (Benson, 1859)

Helix cauisa Benson, 1859f: 388; Pfeiffer, 1868 [in 1847–1877]: 118; Hanley and Theobald, 1874 [in 1870–1876]: 37, pl. 90, figs 2, 3 [*Helix causia* L. Pfeiffer 1868, 5: 118 (variation in spelling of *cauisa*)]
Nanina (*Microcystis* ?) *causia* (Benson); Nevill, 1878: 36
Macrochlamys causia (Benson); Godwin-Austen, 1907: 163; Blanford and Godwin-Austen, 1908: 117
Macrochlamys cauisa (Benson); Pholyotha et al., 2020: 186
Burmochlamys cauisa (Benson); Pholyotha et al., 2022: 12
Type material UMZC I.102465.A, **Fig. 86 C** (one of three syntypes from the R. McAndrew collection labelled "*Zonites Causia* Bens., Bens. col., Tenassarim")
Original measurements: "Diam. major 7, minor 6, axis 4 mill."
Other material NHMUK 1888.12.4.465–466 (two shells from the W. Theobald collection labelled "*Macrochlamys causia* Benson, Kalryenmullay Hills, Tenasserim, C.I. p.87.7.").
Type locality Burma: "Habitat ad Phie Than, vallis Tenasserim" [lives at Phie Than, Tenasserim Valley]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. Theobald (1857: 250) listed Benson's manuscript name without providing a description, noting that this species was rare. According to Pholyotha et al. (2020, 2022), no living specimens of this species have been found, its distribution being known only from the type locality and an area near the Salwin River recorded by Blanford and Godwin Austen (1908).

***Burmochlamys perpaula* (Benson, 1859)**

Helix perpaula Benson, 1859f: 390; Pfeiffer, 1868 [in 1847–1877]: 69
Nanina (*Microcystis*) *perpaula* (Benson); Nevill, 1878: 37
Nanina (*Macrochlamys*) *perpaula* (Benson); Tryon, 1886: 89, pl. 29, Fig. 37
Macrochlamys ? *perpaula* (Benson); Godwin-Austen, 1882 [in 1882–1888]: 89, Pl. 14, Fig. 5; Blanford and Godwin-Austen, 1908: 123; Ramakrishna et al., 2010: 278; Pholyotha et al., 2020: 187
Burmochlamys perpaula (Benson, 1859); Pholyotha et al., 2022: 14
Type material not located
Original measurements: "Diam. major 2, minor 1⅔, axis 1⅓ mill."
Type locality Burma: "Habitat ad Phie Thán, raro" [lives at Phie Thán, rare]
Remarks Benson based his original description on a single shell provided by William Theobald: "The single specimen received is much weathered. It is probably translucent and polished when fresh". Theobald (1857: 250) had previously listed Benson's manuscript name without providing a description, noting that the species was very rare. The holotype could not be located in either the Benson or Theobald collections and is presumed lost. This species has also been recorded from India (Bihar, Jharkhand, Sikkim and West Bengal-Darjeeling) and Nepal (Ramakrishna et al., 2010; Budha et al., 2015). No living specimens were found in recent studies in Burma (Pholyotha et al., 2020, 2022).

Genus *Tanychlamy*s Benson 1834 [61]

***Tanychlamys* ? *aspides* (Benson, 1863)** comb. nov.

Helix aspides Benson, 1863b: 320; Pfeiffer, 1868 [in 1847–1877]: 118; Hanley and Theobald, 1873 [in 1870–1876]: 28, pl. 62, figs 7–9
Nanina (*Bensonia*) *aspides* (Benson); Tryon, 1886: 109, pl. 36, figs 83–85
Macrochlamys? *aspides* (Benson); Blanford and Godwin-Austen, 1908: 116; Pholyotha et al., 2020: 191
Material a neotype (UMZC I.103795.A, **Fig. 86 A**) is hereby designated from a series of four shells in the R. McAndrew collection labelled "*Nanina Aspides* Bens., Bens. col., Aracan"; on the reverse, a pencil note in another hand reads "cf. *subpelasus* Neu., [illeg.] G A" [Godwin-Austen]). We have designated a neotype with the express purpose of clarifying the taxonomic status of *T. aspides* (see below).
Original measurements: "Diam. major 11, minor 9, axis 5 mill."
Type locality Burma?
Remarks Benson (1863b: 320) based his original description on one shell: "A single specimen was sent by Mr. W. Theobald for examination, without any indication of locality, which may possibly be Burmese". It is not clear from whom the four specimens labelled "Aracan" in the Benson collection were obtained, or if this lot includes the holotype. No specimens labelled as *aspides* could be found amongst Theobald collection material in the NHM or RAMM. Pholyotha et al. (2020) provided descriptions and illustrations of the genitalia and radula of specimens identified as this species, and also recorded a living specimen.

***Tanychlamys aulopis* (Benson, 1863)** comb. nov.

Helix aulopis Benson, 1863b: 318; Pfeiffer, 1868 [in 1847–1877]: 93; Hanley and Theobald, 1870 [in 1870–1876]: 15, pl. 30, figs 8, 9
Nanina aulopis (Benson); Nevill, 1878: 32
Macrochlamys aulopis (Benson); Godwin-Austen, 1895a: 446; Blanford and Godwin-Austen, 1908: 128; Ramakrishna et al., 2010: 263; Rao et al., 2013: 136
Type material UMZC I.103355.A, **Fig. 86 B** (holotype from the R. McAndrew collection labelled "*Videssa Aulipsis* [sic] Bens.", no locality or collection data)
Original measurements: "Diam. major 12, minor 10, axis 6 mill."
Other material UMZC I.103355.B–C (two additional shells from the holotype lot)
Type locality Andaman Islands: "ad Portum Blair" [at Port Blair]
Remarks Benson based his original description on one specimen: "A single specimen of this shell, in good condition, was received from Major Haughton". Only one of the three specimens in the Benson collection matches the description in terms of condition and size, and this specimen (UMZC I.103355.A) is therefore identified as the holotype. This species is endemic to the Andaman and Nicobar Islands (Rao et al., 2013).

***Tanychlamys choinix* (Benson, 1861)** comb. nov.

Helix choinix Benson, 1861d: 83; Pfeiffer, 1868 [in 1847–1877]: 117; Hanley and Theobald, 1872 [in 1870–1876]: 24, Pl. 51, Fig. 1
Nanina (*Macrochlamys*) *choinix* (Benson); Nevill, 1878: 23; Tryon, 1886: 96, Pl. 32, Fig. 33
Macrochlamys choinix (Benson); Blanford and Godwin-Austen, 1908: 124; Ramakrishna et al., 2010: 265; Rao et al., 2013: 135
Type material UMZC I.103440, **Fig. 86 D** (one of three syntypes from the R. McAndrew collection labelled "*Nanina Choinix* Bens., Bens. col., Andeman Ids")

Original measurements: "Diam. major 17, minor 14½, axis 8 mill.; apert. 9½ mill. lata, 8 mill. longa."
Other material NHMUK 1888.12.4.1596–1598 (three shells from the W. Theobald collection labelled "*Macrochlamys choinix* Benson (typical), Andamans")
Type locality Andaman Islands: "Habitat in Insulis Andamanicis" [lives on the Andaman Islands]
Remarks The number of specimens provided by Dr Walker and Captain Haughton was not noted in Benson's original description. This species is endemic to the Andaman Islands (Rao et al., 2013).

***Tanychlamys decussata* (Benson, 1836)** comb. nov.

Nanina decussata Benson, 1836a: 350; Pfeiffer, 1847 [in 1847–1877]: 70; Pfeiffer, 1853 [in 1847–1877]: 62
Helix decussata (Benson); Reeve, 1852 [in 1851–1854], 7 (*Helix*): pl. 124, species 743; Hanley and Theobald, 1874 [in 1870–1876]: 46, pl. 112, figs 1, 2, 3
Nanina (*Macrochlamys*) *decussata* (Benson); Blanford, 1863b: 83; Nevill, 1878: 22; Tryon, 1886: 90, pl. 30, figs 59, 60
Macrochlamys decussata (Benson); Godwin-Austen, 1883 [in 1882–1888]: Pl. 19, Fig. 6, Pl. 21, Fig. 15; Blanford and Godwin-Austen, 1908: 102; Ramakrishna et al., 2010: 266
Type material UMZC I.102015.A, **Fig. 86 F** (one of three syntypes from the R. McAndrew collection labelled "*Nanina Decussata* Bens., Bens. col.", no locality data); NHMUK 1879.12.26.60–61 (two syntypes presented by the India Museum labelled "*H. decussata* Bens, Cherra")
Original measurements: "Diam. 1 poll; axis 0.35"
Type locality Bangladesh: part of a collection "chiefly made in the hills on the N.E. Frontier of Bengal"
Remarks The number of specimens examined was not noted in Benson's original description, which was based on material in the Museum of the Asiatic Society acquired from an expedition to "Sylhet, Cherra Poonji and the Khasi Hills" (Pearson, 1833). Specimens from the Asiatic Society's collection were transferred to the EIC's India Museum in 1839, and in turn presented to the BM. We therefore accept these shells as part of the type series. Nevill (1878: 22) listed specimens in the Indian Museum collected at Cherra Poonjee by Henry Blanford and Godwin-Austen, but no material from the Asiatic Society that might form part of the type series. Blanford and Godwin-Austen (1908:102) stated that "The type, measuring 25 mm in major diameter, was subangulate at the periphery and possibly immature" but they did not provide further details about the provenance of this specimen; the larger shell from lot NHMUK 1879.12.26.60 has a diameter of 24.7 mm. According to Blanford and Godwin-Austen (1908: 102) *decussata* occurred in the "Khási Hills" and was common at "Cherra Punji". It has also been reported from Bangladesh (Ramakrishna et al., 2010).

***Tanychlamys hodgsoni* (Benson, 1859)** comb. nov.

Helix hodgsoni Blanford MSS in Benson, 1859h: 267; Pfeiffer, 1868 [in 1847–1877]: 110; Hanley and Theobald, 1870 [in 1870–1876]: 15, pl. 31, figs 2, 3
Nanina (*Macrochlamys*) *hodgsoni* (Benson); Blanford, 1863b: 83
Nanina (*Microcystis*) *hodgsoni* (Benson); Nevill, 1878: 38
Macrochlamys hodgsoni (Benson); Godwin-Austen, 1907 [in 1897–1914]: 159, pl. 109, figs 1, 1a, 2–2d; Blanford and Godwin-Austen, 1908: 85; Ramakrishna et al., 2010: 270
Type material NHMUK 1906.1.1.18, **Fig. 87 A** (holotype from the W.T. Blanford collection labelled "*Macrochlamys hodgsoni* Benson, Darjiling")
Original measurements: "Diam. major vix 7, minor 6, axis 4½ mill."
Other material NHMUK 1906.2.2.32 (two shells from the W.T. Blanford collection labelled "*N.* (*Macrochlamys*) *hodgsoni* Bens., Punkabari, Darjiling")
Type locality India: "Habitat at Pankabari, in regione calidiori Terai" [lives at Pankabari, in the warm region of Terai]
Remarks Benson based his description on a single worn shell in the collection of William Blanford. The specimen in the W.T. Blanford collection (NHMUK 1906.1.1.18) matches the description and dimensions given by Benson and is therefore considered to be the holotype. It is listed in the Blanford Collection register as being collected by Benson, an error probably made by Godwin-Austen because this was the shell examined by Benson. Blanford and Godwin-Austen (1908) reported this species from Sikhim at low elevations, at Pankabari at 1000 feet, and in the hills east of Teesta up to 10,000 feet. Godwin-Austen (1907 [in 1897–1914]) made a large collection from the "Richila Peak", suggesting that this species is also likely to extend into Bhutan.

***Tanychlamys lecythis* (Benson, 1852)** comb. nov.

Helix Lecythis Benson, 1852a: 406; Pfeiffer, 1853 [in 1847–1877]: 47; Reeve, 1853 [in 1851–1854], 7 (*Helix*): pl. 172, species 1164; Hanley and Theobald, 1873 [in 1870–1876]: 28, pl. 63, figs 8, 9
Nanina (*Macrochlamys*) *lecythis* (Benson); Blanford, 1863b: 83
Nanina (*Macrochlamys*) *vesicula* var. *lecythis* Benson; Tryon, 1886: 87, pl. 28, figs 12–14
Macrochlamys lecythis (Benson); Godwin-Austen, 1883 [in 1882–1888]: pl. 5, 1899: 134, pl. 94, figs, 2,

2a; Blanford and Godwin-Austen, 1908: 98; Ramakrishna et al., 2010: 273

Type material UMZC I.103880, **Fig. 89 E** (syntype from the R. McAndrew collection labelled "*Macrochlamys lecythis*, Bens., Bens. col. (original label *Nanina lecythis*, Bens) cf. Reg. May 27th 1908, 3", no locality data); UMZC I.103885 (four syntypes from the R. McAndrew collection labelled "*Nanina Lecythis* Bens., Bens. col.", no locality data; a later label reads "*Macrochlamys* cf. Reg. May 27, 1908")

Original measurements: "Diam. major 12, minor 10, alt. 6 mill."

Other material NHMUK 20190442 (single broken shell from the H. Cuming collection labelled "*lecythis* Bens, Rajmahal Hills, MC" [Museum Cuming]; a later addition in pencil states "*vesicula*?").

Type locality India: "Hab. in montibus prope Rajmahal Bengaliae. Teste Dr. J.F. Bacon" [Habitat: in the mountains near Rajmahal in Bengal. Seen by Dr. J.F. Bacon]

Remarks The number of specimens provided by J.F. Bacon was not noted in Benson's original description, but he discussed variation in the relative height of the shells so he must have examined several. Blanford and Godwin-Austen (1908: 99) remarked on the similarity of *lecythis* to both *T. subjecta* and *T. vesicula*, even going so far as to suggest that the latter was conspecific (see also Tryon, 1886: 87). The NHM specimen is likely to have originated from Bacon's collection, which was sold at auction in 1856 and was apparently purchased by Hugh Cuming.

Tanychlamys lubrica (Benson, 1852) comb. nov.

Helix lubrica Benson, 1852b: 349; Pfeiffer, 1853 [in 1847–1877]: 629; Pfeiffer, 1868 [in 1847–1877]: 44; Reeve, 1853 [in 1851–1854], 7 (*Helix*): pl. 171, species 1153; Hanley and Theobald, 1872 [in 1870–1876]: 24, pl. 51, figs 8, 9

Nanina (*Macrochlamys*) *lubrica* (Benson); Blanford, 1863b: 83; Nevill, 1878: 22; Tryon, 1886: 92, pl. 31, figs 81, 82

Macrochlamys lubrica (Benson); Godwin-Austen, 1883 [in 1882–1888]: 118, Pl. 24, Fig. 7; Blanford and Godwin-Austen, 1908: 89; Ramakrishna et al., 2010: 274

Type material UMZC I.103900.A, **Fig. 87 B** (one of two syntypes from the R. McAndrew collection labelled "*Nanina Lubrica* Bens., Bens. col., Darjiling")

Original measurements: "Diam. major 24, minor 20, axis 11 mill."

Type locality India: "Hab. ad Darjiling" [lives at Darjiling]

Remarks Benson (1852b: 349) noted that he had "long possessed the pale-coloured variety from Darjiling; the acquisition of a second dark-coloured specimen from Mr. Trotter has confirmed the distinctness of the species." The figured shell (UMZC I.103900.A) is the dark-coloured specimen provided by Robert Trotter. This species has been recorded from several regions of India (West Bengal-Darjeeling, Sikkim and Meghalaya) as well as Nepal (Blanford and Godwin-Austen, 1908; Ramakrishna et al., 2010; Budha et al., 2015).

Tanychlamys molecula (Benson, 1859) comb. nov.

Helix molecula Benson, 1859f: 389; Pfeiffer, 1868 [in 1847–1877]: 69; Hanley and Theobald, 1870 [in 1870–1876]: 15, pl. 32, figs, 8, 9

Nanina (*Macrochlamys*) *molecula* (Benson); Blanford, 1863b: 83; Tryon, 1886: 103, pl. 35, figs 25, 26

Nanina (*Microcystis*) *molecula* (Benson); Nevill, 1878: 38

Macrochlamys ? *molecula* (Benson); Godwin-Austen, 1882 [in 1882–1888]: 88, Pl. 16, Fig. 8; Blanford and Godwin-Austen, 1908: 122; Ramakrishna et al., 2010: 275

Type material UMZC I.102510.A, **Fig. 87 C** (one of five syntypes from the R. McAndrew collection labelled "*Zonites Molecula* Bens., Bens. col., Rangoon"; seven shells were originally mounted, of which two are missing)

Original measurements: "Diam. major vix 5, minor 4, axis 3 mill."

Other material NHMUK 1888.12.4.516–518 (three shells from the W. Theobald collection labelled "*H.* (*Macrochlamys*) *molecula* Benson (typical), Rangoon"); NZSI M.12993/2 (four shells labelled "*Macrochlamys molecula* Bens., Rangoon, Type")

Type locality Burma: "Habitat ad Rangoon, satis copiose" [lives at Rangoon, quite abundantly]

Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. Theobald (1857: 249) had previously included Benson's manuscript name in his list of Burmese species without providing a description, noting that "This little species abounds on the Great Pagoda". Despite the labelling, it is unlikely that the ZSI specimens formed part of Benson's type series. This species has also been recorded from India and Thailand (Ramakrishna et al., 2010).

Tanychlamys ? *neherensis* (Benson, 1864) comb. nov.

Helix neherensis Benson, 1864c: 210; Pfeiffer, 1868 [in 1847–1877]: 164; Hanley and Theobald, 1870 [in 1870–1876]: 15, pl. 32, figs 5, 6; Tryon, 1887: 33, pl. 7, figs 80, 81

Nanina (*Microcystis*) *neherensis* (Benson); Nevill, 1878: 38

Macrochlamys ? *neherensis* (Benson); Blanford and Godwin-Austen, 1908: 139; Ramakrishna et al., 2010: 275; Raheem et al., 2014: 105, Fig. 66E–F

Type material UMZC I.103240.B, **Fig. 87 E** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 105) from the R. McAndrew collection labelled "*Nanina Neherensis* Bens., Bens. col., Neher, Ind."); UMZC I.103240.A, **Fig. 87 F** (paralectotype from the same lot)

Original measurements: "Diam. major 5, minor 4, axis 2 mill."

Type locality India: "Habitat ad Neher, Mahabaleshwar. Detexit S.B. Fairbank" [lives at Neher, Mahabaleshwar. Discovered by S.B. Fairbank]

Remarks The number of specimens provided by S.B. Fairbank was not noted in Benson's original description. Nevill (1878: 38) listed a lot of seven specimens labelled "Mahableshwar and Khandala; coll. Rev S.B. Fairbank" in the Indian Museum; these are not considered part of the type series. This species is endemic to the Western Ghats (Raheem et al., 2014).

***Tanychlamys patane* (Benson, 1859)** comb. nov.

Helix patane Benson, 1859h: 270; Pfeiffer, 1868 [in 1847–1877]: 113; Hanley and Theobald, 1875 [in 1870–1876]: 52, pl. 130, figs 5, 6, 7

Nanina (*Macrochlamys*) *patane* (Benson); Blanford, 1863b: 83; Tryon, 1886: 96, pl. 32, figs 30–32 (as *patanae*)

Nanina patane (Benson); Nevill, 1878: 27

Macrochlamys patane (Benson); Godwin-Austen, 1888 [in 1882–1888]: 211, Pl. 53, Fig. 5; Blanford and Godwin-Austen, 1908: 89; Ramakrishna et al., 2010: 277

Type material NHMUK 1906.1.1.63, **Fig. 87 D** (holotype from the W.T. Blanford collection labelled "Darjiling, W.T. Blanford")

Original measurements: "Diam. major vix 9, minor 8, axis 4 mill."

Type locality India: "Habitat ad Darjiling, rarissime" [lives at Darjiling, very rarely]

Remarks The species is based on one shell: "Mr W.T. Blanford appears to have seen only the single specimen here described, and which, although taken in a dead state, is in fair condition." Nevill (1878: 27) mentioned a shell in the Indian Museum from Darjeeling collected by Stoliczka. This species has been recorded from North East India (West Bengal-Darjeeling, Sikkim) and from Nepal (Budha et al., 2015).

***Tanychlamys pauxillula* (Benson, 1859)** comb. nov.

Helix pauxillula Benson, 1859f: 390; Pfeiffer, 1868 [in 1847–1877]: 119; Hanley and Theobald, 1874 [in 1870–1876]: 38, pl. 90, figs 7, 8, 9

Nanina (*Macrochlamys*) *pauxillula* (Benson); Blanford, 1863b: 83

Nanina (*Microcystis*) *pauxillula* (Benson); Nevill, 1878: 37

Nanina pauxillula (Benson); Tryon, 1886: 120, pl. 40, figs 38–40

Macrochlamys ? *pauxillula* (Benson); Blanford and Godwin-Austen, 1908: 124

Type material UMZC I.102495.A, **Fig. 88 C** (one of three syntypes from the R. McAndrew collection labelled "*Zonites Pauxillula* Bens., Bens. col."; another label on the back of the box reads: "*H. pauxillula* Bens., Thayet Myo Pegu. Type")

Original measurements: "Diam. major 2, minor 1½, axis ⅔ mill."

Type locality Burma: "Habitat ad Thyet Mio, nec raro" [lives at Thyet Mio, but rarely]

Remarks The number of shells provided by William Theobald was not noted in Benson's original description. Theobald (1857: 249) had previously included Benson's manuscript name in his list of Burmese species without providing a description, noting that "this minute helix is rare". According to Blanford (1904), the shell figured in *Conchologia Indica* (Hanley and Theobald, 1874 [in 1870–1876], pl. 90) appears to be different, and may be *T. curvilabris* W.T. Blanford, 1904.

***Tanychlamys pedina* (Benson, 1865)** comb. nov.

Helix pedina Benson, 1865b: 13; Pfeiffer, 1868 [in 1847–1877]: 100; Pfeiffer, 1876 [in 1847–1877]: 108, 530; Hanley and Theobald, 1872 [in 1870–1876]: 24, Pl. 51, Fig. 3

Nanina (*Macrochlamys*) *pedina* (Benson); Nevill, 1878: 21; Tryon, 1886: 91, Pl. 30, Fig. 72

Macrochlamys pedina (Benson); Godwin-Austen, 1907 [in 1897–1914]: 87, 133; Blanford and Godwin-Austen, 1908: 132, Fig. 50 [shell], Fig. 51A [anatomy]; Ramakrishna et al., 2010: 277; Raheem et al., 2014: 105, Fig. 67A–B

Sarika pedina (Benson); Pholyotha et al., 2018: 764

Type material UMZC I.103085, **Fig. 88 A** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 105, Fig. 67A) from the R. McAndrew collection labelled "*Nanina Pedina* Bens., Bens. col., Bombay"); UMZC I.103080, **Fig. 88 B** (paralectotype from the same lot)

Original measurements: "Diam. major 32, minor 28, axis 14 mill."

Other material UMZC I.103090 (two shells from the R. McAndrew collection labelled "*Nanina Pedina* Bens.", no collection data)

Type locality India: "Habitat prope Bombay et Ahmednugger" [lives near Bombay and Ahmednugger]

Remarks Benson's type series contained at least four specimens, received "from Dr Jerdon, Major H. Alexander, Mr Fairbank and others" (Benson, 1865b: 14). Pholyotha *et al.* (2018) have assigned this species to *Sarika* Godwin-Austen, 1907 on the basis that it lacks a coiled penial caecum (cf. Blanford and Godwin-Austen, 1908). In their diagnosis for *Sarika*, Blanford and Godwin-Austen (1908: 276) stated "no coiled caecum", just before they indicated "the retractor muscle of the penis … given off directly at the head of that organ." Coupled with the detailed description and figure of the genitalia of the type species of *Sarika*, *S. resplendens* (Blanford and Godwin-Austen, 1908: 277–278), this strongly points to *Sarika* lacking an epiphallic caecum (penial caecum *sensu* Blanford and Godwin-Austen, 1908). Blanford and Godwin-Austen's 1908 account of *Sarika* was based on the original description by Godwin-Austen (1907: 179–180). The latter provides additional evidence for the absence of an epiphallic caecum in *Sarika* because when comparing the genitalia of *Sarika* to *Macrochlamys*, it states that "… the male organ is more like that of *Hemiplecta* (*humphreysiana*)" (see the description of in Godwin-Austen, 1898, p. 75). While the reproductive anatomy of many described species of South Asian *Tanychlamys* is not known, the genitalia has been described for the type species, *T. indica* (Godwin-Austen, 1883), as well as several other species (see Blanford and Godwin-Austen, 1908, pp. 77–145), and in all of these the epiphallic caecum is present. In these species, the epiphallic caecum consists usually of a tightly wound, distinctly coiled mass (e.g. *T. indica*), but it may be long and cylindrical (*T. pedina*), long and wound into a loose coil (*T. richilaensis* Godwin-Austen, 1907 and *T. zemoensis* Godwin-Austen, 1907), or a broad, amorphous mass (*T. castaneo-labiata* Godwin-Austen, 1883). Apart from the difference in the epiphallic caecum, *T. pedina* is strikingly similar to *T. indica* in its reproductive anatomy (cf. figures 43 and 51, Blanford and Godwin-Austen, 1908), as well as in the morphology of the shell, radula and arrangement of the mantle (Blanford and Godwin-Austen, 1908: 95–96 and 132–133). For these reasons we retain *pedina* in the genus *Tanychlamys*. This species is endemic to the central and northern parts of the Western Ghats, and to the country to the north as far as Kutch in Gujarat (Raheem et al., 2014).

***Tanychlamys ? perfucata* (Benson, 1853)** comb. nov.

Helix perfucata Benson, 1853c: 93; Pfeiffer, 1859 [in 1847–1877]: 50
Nanina perfucata (Benson); Tryon, 1886: 124
Macrochlamys ? *perfucata* (Benson); Blanford and Godwin-Austen, 1908: 138; Naggs and Raheem, 2000: 60, Fig. 80

Type material not located
Original measurements: "Diam. major 5, minor 4, axis 3 mill."
Type locality Sri Lanka: "Hab. in pago Gallensis, inter saxa" [lives in the Galle district, between rocks]
Remarks The number of specimens provided by Edgar Layard was not noted in Benson's original description. Blanford and Godwin-Austen (1908: 138) wrote: "It is quite possible that Benson's type, now no longer available, may have been immature ...", although they did not explain how the type was lost. This species is endemic to Sri Lanka (Naggs and Raheem, 2000). There is only one species of *Tanychlamys* known from Sri Lanka, namely *T. indica* (Godwin-Austen, 1883), although this is introduced. It is therefore likely that *perfucata* belongs to *Eurychlamys*, although this awaits confirmation.

***Tanychlamys ? petasus* (Benson, 1859)** comb. nov.

Helix petasus Benson, 1859f: 388; Pfeiffer, 1868 [in 1847–1877]: 197; Hanley and Theobald, 1874 [in 1870–1876]: 37, pl. 89, figs 8, 9
Nanina (*Macrochlamys*) *petasus* (Benson); Blanford, 1863b: 83
Nanina (*Microcystis*) *petasus* (Benson); Nevill, 1878: 35
Nanina (*Bensonia*) *petasus* (Benson); Tryon, 1886: 109, pl. 36, figs 81, 82
Macrochlamys ? *petasus* (Benson); Godwin-Austen, 1883 [in 1882–1888]: 210, Pl. 53, Fig. 6; Blanford and Godwin-Austen, 1908: 115; Ramakrishna et al., 2010: 279; Pholyotha et al., 2020: 188
Type material UMZC I.102720.A, **Fig. 88 D** (one of five syntypes from the R. McAndrew collection labelled "*Nanina Petasus* Bens., Bens. col., Phie Than, Burmah")
Original measurements: "Diam. major 10, minor 9, axis 4 mill."
Other material NHMUK 1954.6.2.272 (single shell from the J.S. Hawkins collection labelled "*Helix petasus* Benson, Paratype, Phil Than vallis Tenaserim"); NHMUK 1888.12.1.1494–1496 (three shells from the W. Theobald collection); UMZC I.102725 (single shell from the R. McAndrew collection labelled "*Nanina Petasus* Bens., Bens. col.", no locality data)
Type locality Burma: "Habitat ad Phie Than, vallis Tenasseri" [lives at Phie Than, Tenasserim Valley]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description, but there was clearly more than one since he provided measurements for an un-named variety ("var. *spira convexiori* [convex spire]: Diam. major 9½, minor 9, axis 4 ½ mill"). Theobald (1857: 250) listed Benson's manuscript name without providing a

description, noting that the species was common at the type locality. UMZC I.102725 belongs to a different species and is not part of the type series. NHMUK 1954.6.2.272 was given to J.S. Hawkins by Col. Robert Gordon as part of a collection of specimens from Moulmein (letter from Gordon to Hawkins, ZOO_MSS_HAW) and therefore cannot form part of the type series, despite the label claiming 'paratype' status. This specimen was incorrectly listed as a 'possible syntype' by Pholyotha et al. (2020). Nevill (1878: 35) listed a lot of two shells labelled "Phie Than; coll W. Theobald Esq.; ex c. As. Soc. Bengal" in the Indian Museum. Pholyotha et al. (2020) recorded two living specimens identified as this species and provided descriptions and figures of the genitalia and radula of this species.

***Tanychlamys planiuscula* (Benson, 1838)** comb. nov.

Helix planiuscula Benson, 1838b: 218
Helix planiuscula Hutton; Pfeiffer, 1848 [in 1847–1877]: 60; Hanley and Theobald, 1870 [in 1870–1876]: 15, pl. 32, figs 7, 10
Nanina (*Macrochlamys*) *planiuscula* (Hutton); Tryon, 1886: 95, pl. 32, figs 19, 20
Macrochlamys? *planiuscula* (Hutton); Godwin-Austen, 1883 [in 1882–1888]: 88, Pl. 16, Fig. 7; Blanford and Godwin-Austen, 1908: 302
Macrochlamys planiuscula (Hutton); Ramakrishna et al., 2010: 280
Type material UMZC I.102095.A, **Fig. 88 E** (one of 12 syntypes from the R. McAndrew collection labelled "*Helicella Planuscula* [sic] Hutton, Bens. col.", no locality data); NHMUK 1856.9.15.51 (six syntypes from the T. Hutton collection labelled "Simla and Mussorie")
Original measurements: "Diam. 0.1." [poll.]
Type locality India: "Found at *Simla* on dead leaves"
Remarks This species is often attributed to Hutton (or to Hutton & Benson) but Benson's initial (B) follows the relevant section of their joint paper (Hutton and Benson, 1838), so we consequently attribute sole authorship to Benson. The number of specimens was not noted in the original description.

***Tanychlamys rorida* (Benson, 1859)** comb. nov.

Helix rorida Benson, 1859h: 266
Nanina (*Macrochlamys*) *rorida* (Benson); Blanford, 1863b: 83
Nanina (*Microcystis*) *rorida* (Benson); Nevill, 1878: 38
Nanina rorida (Benson); Tryon, 1886: 124
Macrochlamys rorida (Benson); Godwin-Austen, 1907 [in 1897–1914]: 160, pl. 109, figs 3, 3a, 3b; Blanford and Godwin-Austen, 1908: 94; Ramakrishna et al., 2010: 283
Type material UMZC I.102565, **Fig. 88 F** (syntype from the R. McAndrew collection labelled "*Nanina Rorida* Bens., Bens. col., Darjiling")
Original measurements: "Diam. major 5, minor 4½, axis 2½ mill."
Other material NHMUK 1906.1.1.17 (single shell from the W.T. Blanford collection labelled "*Macrochlamys rorida* Benson, Darjiling, No. 33 Coll. W.T. Blanford, figd"); UMZC I.104700 (three shells from the R. McAndrew collection labelled "Chusan")
Type locality India: "Habitat ad Darjiling, necnon ad collem Sunhul" [lives at Darjiling, and also at Sunhul hill]
Remarks The number of specimens provided by William Blanford from "succulent shrubs at elevations between 7000 and 8000 feet" was not noted in Benson's original description. The register for the Blanford collection in the NHM contains an entry for a single shell (NHMUK 1906.1.1.17) from "Darjiling", which incorrectly records Benson as the collector rather than the authority; this is the shell figured by Godwin-Austen (1907), and closely matches the measurements provided in Benson's description. The locality of "Chusan" given for UMZC I.104700 is clearly incorrect.

***Tanychlamys sequax* (Benson, 1859)** comb. nov.

Helix sequax Benson, 1859h: 270; Pfeiffer, 1868 [in 1847–1877]: 118; Hanley and Theobald, 1873 [in 1870–1876]: 28, pl. 63, figs 1, 2, 3
Nanina (*Macrochlamys*) *sequax* (Benson); Blanford, 1863b: 83; Nevill, 1878: 23; Tryon, 1886: 96, pl. 32, figs 34, 35
Macrochlamys sequax (Benson); Godwin-Austen, 1907 [in 1897–1914]: 166, pl. 106, figs 1–1d; Blanford and Godwin-Austen, 1908: 86; Ramakrishna et al., 2010: 284
Type material UMZC I.102750.A, **Fig. 89 C** (one of seven syntypes from the R. McAndrew collection labelled "*Nanina Sequax* Bens., Bens. col., Darjiling")
Original measurements: "Diam. major 18, minor 15, axis 7 mill."
Type locality India: "Habitat copiose ad Darjiling et in valle Rungun (7000 et 4000 ped. alt.)" [lives abundant at Darjiling and in the Rungun valley (altitude of 7000 and 4000 feet)]
Remarks The number of specimens provided by Robert Trotter and W.T. Blanford was not noted in Benson's original description. Nevill (1878: 23) listed specimens in the Indian Museum from "Darjeeling" collected by various people "at 6000 feet", but these cannot be recognized as type material. Blanford and Godwin-Austen (1908: 86) characterized the species on

the basis of material derived from several sources, especially shells and wet specimens collected at the type locality by William Blanford. In addition to the Indian localities mentioned above, this species has also been recorded from Nepal (Budha et al., 2015).

***Tanychlamys stephus* (Benson, 1861)** comb. nov.

Helix stephus Benson, 1861d: 84; Pfeiffer, 1868 [in 1847–1877]: 105; Hanley and Theobald, 1873 [in 1870–1876]: 28, pl. 62, figs 4, 5, 6
Nanina (*Macrochlamys*) *stephus* (Benson); Nevill, 1878: 23; Tryon, 1886: 118, pl. 39, figs 22–24
Macrochlamys stephus (Benson); Godwin-Austen, 1888b: 56; Godwin-Austen, 1895a: 441, 446; Godwin-Austen, 1898 [in 1897–1914]: 50; Blanford and Godwin-Austen, 1908: 127; Ramakrishna et al., 2010: 286; Rao et al., 2013: 136
Type material not located
Original measurements: "Diam. major 10, minor 9, axis 4½ mill."
Type locality Andaman Islands: "Habitat ad Portum Blair Andamanicum" [lives at Port Blair, Andaman Islands]
Remarks The number of specimens provided by Dr James Walker and Captain J.C. Haughton was not noted in Benson's original description, but there were clearly several: "Specimens in different stages of growth and condition have been received ...". Nevill (1878: 23) listed 24 shells in the Indian Museum from "Mt Harriet" collected by various people but these do not appear to include the type series. This species is listed in McAndrew's *Catalogue* but no Benson specimens could be found in the UMZC. This species is endemic to the Andaman Islands (Rao et al., 2013).

***Tanychlamys subjecta* (Benson, 1852)** comb. nov.

Helix subjecta Benson, 1852a: 407; Pfeiffer, 1853 [in 1847–1877]: 48; Reeve, 1853 [in 1851–1854], 7 (Helix): pl. 172, species 1165; Hanley and Theobald, 1873 [in 1870–1876]: 28, pl. 64, figs, 1, 2, 3
Nanina (*Macrochlamys*) *subjecta* (Benson); Blanford, 1863b: 83; Nevill, 1878: 25; Tryon, 1886: 88, pl. 29, figs 25–27
Macrochlamys subjecta (Benson); Blanford and Godwin-Austen, 1908: 98; Budha et al., 2015: 23; Ramakrishna et al., 2010: 286
Type material UMZC I.105240, **Fig. 89 A** (syntype from the R. McAndrew collection labelled "*Nanina Subjecta* B., Bens. col., Rajmahal")
Original measurements: "Diam. major 17, minor 14, axis 8½ mill."
Other material NZSI M.3656/1, **Fig. 89 B** (one of two shells from the collection of the Asiatic Society labelled "*Macrochlamys subjecta* Benson, Rajmehal, A.S.B. [Asiatic Society of Bengal], Type")
Type locality India: "Hab. in montibus Bengaliae non procul ab urbe Rajmahal. Teste Dr. Bacon" [lives in the mountains of Bengal, not far from the town of Rajmahal, according to Dr. Bacon]
Remarks The number of specimens provided by J.F. Bacon was not noted in Benson's original description. Nevill (1878: 25) listed several lots of this species in the Indian Museum, including one lot of four shells labelled "Rajmehal; ex c. As. Soc. Bengal", although these have no link to Benson. Blanford and Godwin-Austen (1908) recorded this species from India (Jharkhand-Rajmahal Hills, Orissa-Cuttak) and there are recent records from Nepal (Budha et al., 2015).

***Tanychlamys tugurium* (Benson, 1852)** comb. nov.

Helix tugurium Benson, 1852b: 348; Pfeiffer, 1853 [in 1847–1877]: 636; Reeve, 1853 [1851–1854], 7 (*Helix*): pl. 171, species 1155; Hanley and Theobald, 1870 [in 1870–1876]: 14, Pl. 29, Fig. 10
Nanina tugurium (Benson); Nevill, 1878: 30
Nanina (*Bensonia*) *tugurium* (Benson); Tryon, 1886: 109, Pl. 36, Fig. 78
Macrochlamys tugurium (Benson); Godwin-Austen, 1882: 69, Pl. 5, Fig. 4; Godwin-Austen, 1883 [in 1882–1888]: Pl. 19, Fig. 2, Pl. 20, Fig. 3; Godwin-Austen, 1907 [in 1897–1914]: 151, Pl. 104, figs 1–7; Blanford and Godwin-Austen, 1908: 81, Fig. 40; Ramakrishna et al., 2010: 288
Type material UMZC I.103935.A, **Fig. 89 D** (one of six syntypes from the R. McAndrew collection labelled "*Nanina Tugurium* Bens., Bens. col., Darjiling")
Original measurements: "Diam. major 19, minor 16, axis 10 mill."
Type locality India: "Hab. ad Darjiling. Teste R. Trotter" [lives at Darjiling, according to R. Trotter]
Remarks The number of specimens provided by Robert Trotter was not noted in Benson's original description. This species has been identified from West Bengal-Darjeeling, Manipur and Sikkim in India (Ramakrishna et al., 2010) and from Nepal (Budha et al., 2015). The chromosomes of examples identified as this species were described by Kiauta and Butot (1973).

***Tanychlamys vesicula* (Benson, 1838)** comb. nov.

Nanina vesicula Benson 1838b: 216
Helix vesicula (Benson); Reeve, 1853 [in 1851–1854], 7 (*Helix*): pl. 172, species 1163; Hanley and Theobald, 1873 [in 1870–1876]: 28, pl. 63, figs 5, 6
Helix (*Nanina*) *vesicula* Benson; Pfeiffer, 1853 [in 1847–1877]: 47

Nanina (*Macrochlamys*) *vesicula* (Benson); Nevill, 1878: 25; Tryon, 1886: 87, pl. 28, figs 9–14
Macrochlamys vesicula (Benson); Blanford and Godwin-Austen, 1908: 79; Ramakrishna et al., 2010: 289
Macrochlamys lecythis (Benson); Blanford and Godwin-Austen, 1908: 99
Type material UMZC I.102190, **Fig. 89 F** (syntype from the R. McAndrew collection labelled "*Macrochlamys vesicula*, Bens., Bens. Coll. [Original label [i.e. McAndrew's label] *Nanina vesicula*, Bens., Bens. Coll. Himalayas] cf. Reg. May 27 1908, 2]" and "Figured specimen"); UMZC I.102185 (seven syntypes from the R. McAndrew collection labelled "*Nanina vesicula*", locality given as "Himalayas" but this has subsequently been crossed out. On the back of the card mount is written "Came from Soti Durga - Head of Ganges Delta. Vide AMNHist. 1852 p. 406"); NHMUK 1856.9.15.40 (five shells from the T. Hutton collection, no locality data)
Original measurements: "Diam 0.6"
Type locality India: "This shell has a wide geographical range, and is yet very local. Lieut. Hutton first met with it between *Neemuch* and *Mhow*, and noticed without naming it in the 3rd vol. of the Journal, p. 521 [Hutton's "*Helix* 29"]. Mr Benson subsequently observed it at the effluence of the *Bhagirathi* from the Ganges, and at *Rajmahal*, and noted it as a novelty in p. 356, vol. 5. Lieut. Hutton again met with it abundantly at *Simla* ..." (Hutton and Benson, 1838: 216).
Remarks The original brief description of *T. vesicula*, which appeared in the paper by Hutton and Benson (1838), was based on specimens from several geographically distant localities. Hutton (1840: 477) also mentioned its broad range "over the central and western tracts of the Bengal Presidency, and occurring in profusion along the verge of the hills at Mansir Debi, mounts to Subathoo, Simla and Huttoo mountain…". A more detailed description was provided by Benson (1852: 406), who gave the original locality as "the territory of Bengal near Sorti-Durga, at the top of the Ganges Delta". He also stated that "I discovered this pretty species during the rainy season of 1835, in a river voyage from Calcutta to Benares, on the branches of a shrubby *Zizyphus*, and below Rajmahal on *Asclepias gigantea* …" Sorti-Durga (see Appendix 2) is near the point where the Bhagirathi River diverges from the Ganges. Blanford and Godwin-Austen (1908: 79, 140) thought that it was unlikely that the lowland (e.g. Neemuch, Mhow and Rajmahal) and Himalayan (e.g. Simla) specimens belonged to the same species, and this needs to be explored further. However, Hutton and Benson (1838) emphasised that *T. vesicula* was widespread, and found "throughout the hills, apparently at all elevations up to 10, 500 feet". Godwin-Austen (Blanford and Godwin-Austen, 1908: 140) also indicated that at the time he examined the UMZC lot it was labelled only as "Himalaya" and that he considered this not to be the original label, but an error by McAndrew (subsequently amended). He stated that "These shells are unmistakably from Lower Bengal, and I can see nothing to distinguish them from *M. subjecta* of Rajmahal" (Blanford and Godwin-Austen, 1908: 140).

Genus *Euaustenia* Cockerell, 1891

Euaustenia cassida (Benson, 1838)

Helicarion cassida Benson, 1838b: 214
Helicarion cassida Hutton; Theobald, 1878: 144; Nevill, 1878: 15; Tryon, 1885, pl. 40, figs 19, 20
Vitrina cassida (Hutton); Pfeiffer, 1848 [in 1847–1877]: 497; Pfeiffer, 1853 [in 1847–1877]: 2; Reeve, 1862 [in 1859–1862], 13 (*Vitrina*): pl. 2, species 10; Hanley and Theobald, 1876 [in 1870–1876]: 61, pl. 152, figs 2, 3
Austenia cassida (Hutton); Godwin-Austen, 1888 [in 1882–1888]: 214, Pl. 54, Fig. 3, 3a (shell – is a large *Parvatella austeniana* Nevill, 1878)
Vitrina monticola Benson; Reeve, 1862 [in 1859–1862], 13, (Vitrina), species 11
Austenia ? *monticola* Benson, MSS; Godwin-Austen, 1888 [in 1882–1888]: 234, Pl. 52, Fig. 2
Euaustenia cassida (Hutton); Blanford and Godwin-Austen, 1908: 150, Fig. 54
Macrochlamys (*Euaustenia*) *cassida* (Benson); Ramakrishna et al., 2010: 290
Type material UMZC I.102080, **Fig. 90 C** (syntype from the R. McAndrew collection labelled "*Vitrina Cassida* Hutton, Western Himalaya" and "Simla"; "BENSON" has been added in pencil in other handwriting, and on the reverse it states "figured in Conch. Indica"); UMZC I.102075 (syntype from the R. McAndrew collection labelled "*Vitrina Cassida* Hutton, Bens. col., Himalaya")
Original measurements: "Greatest breadth 1 inch 2 lines"
Type locality India: "It occurs from *Bhar* to *Simla* but most abundantly between the former place and *Subathú*"
Remarks This species is often attributed to Hutton (or to Hutton & Benson) but Benson's initial (B) follows both the Latin description and comparative section of their joint paper (Hutton and Benson, 1838). Subsequent paragraphs describing the species and its habitat in English are attributed to Hutton, who clearly considered it to be his species (see Hutton, 1840: 478). Nevertheless, it is clear that sole authorship belongs to Benson. *Macrochlamys cassida* Godwin-Austen (1888

[in 1882–1888]: 214) is a synonym of *Parvatella austeniana* G. Nevill (see Blanford and Godwin-Austen, 1908: 148).

Genus *Bensonies* H.B. Baker, 1938

Bensonies camura (Benson, 1859)

Helix camura Benson, 1859h: 269; Pfeiffer, 1868 [in 1847–1877]: 180; Hanley and Theobald, 1872 [in 1870–1876]: 26, Pl. 55, Fig. 2
Euplecta ? *camura* (Benson); Godwin-Austen, 1882: 71, Pl. 5, Fig. 5
Nanina camura (Benson); Nevill, 1878: 30
Nanina (*Oxytes*) *camura* (Benson); Tryon, 1886: 130, Pl. 43, Fig. 43
Bensonia camura (Benson); Godwin-Austen, 1907 [in 1897–1914: 147, Pl. 101, Figs 1–7 (animal and anatomy); Blanford and Godwin-Austen, 1908: 175, Fig. 62 [anatomy]
Bensonies camura (Benson); Ramakrishna et al., 2010: 293
Type material NHMUK 1906.2.2.73, **Fig. 90 E** (one of three syntypes from the W.T. Blanford collection labelled "*Bensonia camura* Bs., Darjiling". A juvenile shell (**Fig. 90 F**) is also figured)
Original measurements: "Diam. major 22, minor 19, axis 10 mill."
Type locality India: "Habitat in valle Rungun, prope Darjiling, rarior" [lives in the Rungun Valley, near Darjiling, rarely]
Remarks Benson based his original description on several specimens in the collection of the Blanford brothers, some of which were juveniles. He noted that the latter bore a resemblance to *Khasiella serrula* (Benson, 1836).

Bensonies monticola (Benson, 1838)

Nanina monticola Benson, 1838b: 215; Hanley and Theobald, 1872 [in 1870–1876]: 24, Pl. 52, Fig. 3; Theobald, 1878: 142
Nanina (*Bensonia*) *monticola* Hutton; Nevill, 1878: 49; Tryon, 1886: 107, Pl. 36, Fig. 68
Helicarion monticola (Benson); Tryon, 1885: 176, pl. 40, figs 21–23
Oxytes (*Bensonia*) *monticola* (Hutton); Godwin-Austen, 1888 [in 1882–1888]: 248
Bensonia monticola (Hutton); Blanford and Godwin-Austen, 1908: 171, Fig. 61
Bensonies monticola (Hutton); Ramakrishna et al., 2010: 295; Budha et al., 2015: 24
Type material UMZC I.102150.A, **Fig. 90 D** (one of four syntypes from the R. McAndrew collection labelled "*Nanina Monticola* Hutton, Bens. col. (origl.). Ind."); NHMUK 1856.9.15.34 (four syntypes from the T. Hutton collection labelled "Simla")
Original measurements: "Diam. 1.75"
Type locality India: "They are abundant at *Mahássú* under fallen timber, and in the rainy season they climb the stalks of plants, feeding upon leaves. The largest specimens occur at *Hattú*, among the ruins of the old forts that crown that mountain. Young specimens were met with among junipers at *Lítí*, at an elevation not much under 14,000 feet" (Hutton and Benson, 1838: 215)
Remarks This species is often attributed to Hutton (or to Hutton & Benson) but Benson's initial (B) follows the relevant section of their joint paper (Hutton and Benson, 1838), so we consequently attribute sole authorship to Benson. Hutton (1840: 479) mentioned it as "*Nanina monticola* (Nob.), which I discovered among juniper bushes at the Burrenda Pass, on the Snowy range". Several specimens were noted in the original description. This species has been identified from NW India (Kashmir, Punjab and Uttarakhand) and from Nepal (Blanford and Godwin-Austen, 1908; Ramakrishna et al., 2010; Budha et al., 2015).

Genus *Oxytesta* Zilch, 1956

Oxytesta cycloplax (Benson, 1852)

Helix cycloplax Benson, 1852b: 348; Reeve, 1853 [in 1851–1854], 7 (*Helix*): Pl. 171, species 1156; Pfeiffer, 1859 [in 1847–1877]: 181; Hanley and Theobald, 1870 [in 1870–1876]: 13, Pl. 26, Fig. 7
Nanina (*Oxytes*) *cycloplax* (Benson); Blanford, 1863b: 85; Tryon, 1886: 129, Pl. 43, Fig. 23
Nanina (*Hemiplecta*) *cycloplax* (Benson); Nevill, 1878: 48
Oxytes cycloplax (Benson); Godwin-Austen, 1883 [in 1882–1888]: 125, pl. 31, figs 1–8; Blanford and Godwin-Austen, 1908: 168
Oxytesta cycloplax (Benson); Ramakrishna et al., 2010: 303
Material UMZC I.103930.A–B, **Figs 91 A–B** (two of five shells from the R. McAndrew collection labelled "*Zonites Cycloplax* Bens., Darjiling"); NHMUK 18606.27.5 (single shell from the W.T. Blanford collection labelled "Darjiling"); NHMUK 1879.10.26.45 (single shell labelled "*cycloplax* Benson, transferred from the India Museum)
Original measurements: "Diam. major 42, minor 34, axis 17 mill."
Type locality India: "Hab. ad Darjiling, Himalayae Sikkimensis montem. Teste R. Trotter" [lives at Darjiling, in the Sikkim-Himalaya mountains, according to R. Trotter]
Remarks The number of specimens provided by Robert Trotter was not noted in Benson's original description. UMZC I.103930 is not labelled as coming from the Benson collection, although this is likely. In addition to the Indian locality given above, this species has been recorded from Nepal (Budha et al., 2015).

Oxytesta orobia (Benson, 1848)

Helix orobia Benson, 1848b: 158; Reeve, 1852 [in 1851–1854], 7 (*Helix*): pl. 123, species 738; Pfeiffer, 1853 [in 1847–1877]: 117; Pfeiffer, 1876 [in 1847–1877]: 220; Hanley and Theobald, 1870 [in 1870–1876]: 14, Pl. 28, Fig. 8
Nanina (*Hemiplecta*) *orobia* (Benson); Nevill, 1878: 48 (with brief description of animal)
Nanina (*Bensonia*) *orobia* (Benson); Tryon, 1886: 108, Pl. 36, Fig. 76
Oxytes orobia (Benson); Godwin-Austen, 1883 [in 1882–1888]: 129, Pl. 30, Fig. 4, pl. 32, figs 1–5 (anatomy); Blanford and Godwin-Austen, 1908: 169, Fig. 59 [shell], fig. 60 [anatomy]
Oxytesta orobia (Benson); Ramakrishna et al., 2010: 303
Type material UMZC I.102410.A–B, **Figs 91 C–D** (two syntypes from the R. McAndrew collection labelled "*Nanina Orobia* Bens., Bens. col., Darjiling")
Original measurements: "Diam. major 35 millim., min. 31. Axis 16 mill."
Type locality India: "Hab. Darjiling regione Sikkim montium Himalayanorum" [lives in the Darjiling region, Sikkim-Himalaya mountains]
Remarks The number of specimens provided by Dr J.F. Bacon was not noted in Benson's original description, which was based on material in his own collection and in the India Museum ["Mus. nost. et Soc. Ind. Orient. Angl. Lond."]. The latter consisted of a specimen "from Dr. Pearson… in the East India Company's Museum in Leadenhall-street", which is likely to be the specimen listed as "10. *Helix* – Found at Darjeeling. The only live specimen I have yet met with." (Pearson, 1840: 729). Benson later noted the receipt of another specimen from Darjeeling, sent by Robert Trotter (Benson, 1852b: 348); this shell does not form part of the type series, but cannot be identified with certainty, rendering the type status of the two specimens in the UMZC unclear. The reproductive anatomy of *O. orobia* has been described by Schileyko and Frank (1994). This species has also been recorded from Nepal (Budha et al., 2015).

Oxytesta oxytes (Benson, 1836)

Helix oxytes Benson, 1836a: 351; Pfeiffer, 1848 [in 1847–1877]: 395; Pfeiffer, 1853 [in 1847–1877]: 250; Pfeiffer, 1876 [in 1847–1877]: 453; Reeve, 1852 [in 1851–1854], 7 (*Helix*): pl. 123, species 734; Hanley and Theobald, 1870 [in 1870–1876]: 13, Pl. 26, Fig. 1
Nanina (*Oxytes*) *oxytes* (Benson); Blanford, 1863b: 85; Tryon, 1886: 129, pl. 42, figs 21, 22
Nanina (*Hemiplecta* ?) *oxytes* (Benson); Nevill, 1878: 47
Oxytes oxytes (Benson); Godwin-Austen, 1883 [in 1882–1888]: 124, pl. 30, figs 1–3; Blanford and Godwin-Austen, 1908: 167, Fig. 60G [foot]
Oxytesta oxytes (Benson); Ramakrishna et al., 2010: 304
Type material UMZC I.102145.A, **Fig. 91 E** (one of five syntypes from the R. McAndrew collection labelled "*Nanina Oxytes* Bens., Bens. col., Ind.")
Original measurements: "Diam. 1.8 poll."
Other material NHMUK 1879.12.26.46–47 (two shells, transferred to the NHM from the India Museum, labelled "*Helix oxytes* Bens, Darjiling")
Type locality Bangladesh: part of a collection "chiefly made in the hills on the N.E. Frontier of Bengal"
Remarks The number of specimens examined was not noted in Benson's original description, which was based on material in the Museum of the Asiatic Society acquired from an expedition to "Sylhet, Cherra Poonji and the Khasi Hills" (Pearson, 1833). Nevill (1878: 47) listed a lot of four shells labelled "Sylhet (types); ex c. As. Soc. Bengal." in the Indian Museum, which is likely to be the type series. The two specimens transferred to the BM from the India Museum in 1879 might represent part of the aforementioned lot. The transfer included 16 Benson species, including two specimens of *"Helix oxytes*". Although these shells cannot be linked directly to Benson, the material consists almost entirely of species that he named using specimens from the collections of the Asiatic Society and Robert Trotter. Benson (1850a: 215) subsequently provided an amended diagnosis of this species based on additional material. This species is the type of *Oxytesta* Zilch, 1956 by typification of a replacement name (Zilch, 1956: 85).

Genus *Sarika* Godwin-Austen, 1907

Helix acerra Benson, 1859

Accepted as *Sarika birmana* (L. Pfeiffer, 1857);
Helix birmana Pfeiffer, 1857c: 107

Helix acerra Benson, 1859f: 389
Nanina (*Macrochlamys*) *acerra* (Benson); Blanford, 1863b: 83; Nevill, 1878: 22
Type material not located
Original measurements: "Diam. major 28, minor 25, axis 9 mill."
Other material UMZC I.102545, **Fig. 91 F** (single shell from the R. McAndrew collection labelled "*Nanina Acerra* Bens., Bens col., Ind."); UMZC I.102550 (two shells from the R. McAndrew collection labelled "*Nanina Acerra* Bens., Bens. col., Ind."); UMZC I.102540 (single large shell from the R. McAndrew collection labelled "*Nanina Acerra* Bens.", no locality or collection data)

Type locality Burma: "Habitat in valle Tenasserim, et ad urbem Mergui, satis frequens" [lives in the Tenasserim Valley, and at the town of Mergui, quite commonly]

Remarks Benson based his original description on "A single specimen, not quite fresh" provided by William Theobald. Theobald (1857: 250) had earlier listed Benson's manuscript name without providing a description, noting that the species was common. Nevill (1878: 22) mentioned a specimen in the Indian Museum labelled "Mergui; coll. W. Theobald Esq. (As. Soc. Bengal)". UMZC I.102540 is much larger than the specimens in the other lots and may belong to another species; moreover, it may not be from the Benson collection. The locality "Ind." on the labels of UMZC I.102545 and UMZC I.102550 is compatible with the type locality in Burma, which was administered as part of British India. *Helix acerra* Benson, 1859 is a junior synonym of *Sarika birmana* (L. Pfeiffer, 1857), although the spiral band of the former has not been observed in the latter (Blanford and Godwin-Austen, 1908: 279). The type locality of *S. birmana* is "Megui, Burmah".

Sarika consepta (Benson, 1860)

Helix consepta Benson, 1860c: 190; Pfeiffer, 1868 [in 1847–1877]: 239; Hanley and Theobald, 1874 [in 1870–1876]: 37, pl. 88, figs 5, 6

Nanina (*Macrochlamys*) *consepta* (Benson); Nevill, 1878: 22; Tryon, 1886: 90, pl. 30, figs 55, 56

Macrochlamys? *consepta* (Benson); Godwin-Austen, 1888 [in 1882–1888]: 209, Pl. 53, Fig. 1; Godwin-Austen, 1883 [in 1882–1888]: 110, Pl. 26, Fig. 4; Blanford and Godwin-Austen, 1908: 115, Fig. 47; Ramakrishna et al., 2010: 265

Sarika consepta (Benson); Pholyotha et al., 2020: 198

Type material a neotype (NHMUK 1888.12.4.2052, **Fig. 86 E**) is hereby designated from a series of four shells from the W. Theobald collection, labelled "*Macrochlamys consepta* Benson, Damathat Caves, near Moulmein"). We have designated a neotype with the express purpose of clarifying the taxonomic status of *T. consepta* (see below).

Original measurements: "Diam. major vix 18, minor 15½, axis 7 mill."

Other material UMZC I.103325 (single shell from the R. McAndrew collection labelled "*Nanina Consepta* Bens., Bens. col., Pegu"; a question mark has later been added in pencil); NHMUK 1906.1.1.164 (single shell from the W.T. Blanford collection labelled "*Macrochlamys consepta* Benson, Moulmein, from Theobald")

Type locality Burma: "Habitat ad Damathá, prope Moulmein. Detexit Capt. J.C. Haughton" [lives at Damathá, near Moulmein. Discovered by Capt. J.C. Haughton]

Remarks Benson based his original description on "A single specimen [presumably the one found by Haughton] in the collection of William Theobald." The specimen in the Benson collection is not labelled as coming from the type locality and, if correct, cannot be the holotype. We have therefore designated one of the Theobald collection specimens from the precise type locality as the neotype. Nevill (1878: 22) listed a lot of four specimens labelled "Pegu; donor Captain Berdmore; ex c. As. Soc. Bengal" in the Indian Museum, together with several specimens representing varieties. These include a single specimen of the "dwarf variety" subsequently mentioned by Benson (1863b: 320) and specimentst identified by Theobald as var. *thyella*, a Benson manuscript name (Nevill, 1878: 23). Ramakrishna et al. (2010) listed *T. consepta* from India (Meghalaya).

Genus *Syama*
W.T. Blanford & Godwin-Austen, 1908

Syama splendens (Benson, 1838)

Nanina splendens Benson, 1838b: 215

Helix splendens (Hutton); Pfeiffer, 1848 [in 1847–1877]: 73; Pfeiffer, 1859 [in 1847–1877]: 124; Hanley and Theobald, 1872 [in 1870–1876]: 24, pl. 51, figs 7, 10

Nanina (*Bensonia*) *splendens* (Hutton); Tryon, 1886: 109, pl. 36, figs 79, 80

Macrochlamys splendens (Hutton); Godwin-Austen, 1883 [in 1882–1888]: 100, pl. 22, figs 4, 4a

Syama splendens (Hutton); Blanford and Godwin-Austen, 1908: 153, Fig. 56

Type material UMZC I.102065.A, **Fig. 92 A** (one of eight syntypes from the R. McAndrew collection labelled "*Nanina Splendens* Hutton, Bens. col.", no locality data); NHMUK 1856.9.15.38 (nine syntypes from the T. Hutton collection labelled "Simla")

Original measurements: "Diam. 0.65."

Type locality India: "found in great abundance in the forest of *Mahássú*, beneath fallen timber, and in the hollow trunks of decaying trees; it is also plentiful at *Fágú* and *Nágkunda*, at 9,016 feet, and has been met with at *Hattú*, at 10,656 feet"

Remarks This species is often attributed to Thomas Hutton (or to Hutton & Benson), but as Benson's initial (B) follows the Latin description in their joint paper (Hutton and Benson, 1838), we consequently attribute sole authorship to Benson. The number of specimens examined was not mentioned, but it was clearly common and was collected from several localities. Blanford and Godwin-Austen (1908: 153) noted that the name *splendens* has been referred to more than one

species, and in his annotated personal copy of *Conchologia Indica* Godwin-Austen indicated that the specimens illustrated were not *splendens*.

Genus *Rahula* Godwin-Austen, 1907

Subgenus *Rahula* Godwin-Austen, 1907

Rahula (*Rahula*) *bascauda* (Benson, 1859)

Helix bascauda Benson, 1859e: 186; Hanley and Theobald, 1870 [in 1870–1876]: 8, Pl. 16, Fig. 1
Nanina (?) *bascauda* (Benson); Nevill, 1878: 42
Helix (*Patula*) *bascauda* Benson; Tryon, 1887: 52, pl. 7, figs 65, 66
Rahula bascauda (Benson); Godwin-Austen, 1907 [in 1897–1914]: 218; pl. 117, figs 1, 1a, 3, 3a; Blanford and Godwin-Austen, 1908: 251; Ramakrishna et al., 2010: 232; Gittenberger et al., 2017b: 415
Type material a neotype (NHMUK 1888.12.4.509, **Fig. 92 B**) is hereby designated from a series of two shells in the W. Theobald collection labelled "*H.* (*Kaliella*) *bascauda* Benson, Khasi Hills"). We have designated a neotype with the express purpose of clarifying the taxonomic status of *R. bascauda* (see below).
Original measurements: "Diam. major 4½, minor 4, axis 4 mill."
Type locality India: "Habitat ad Teria Ghát, montium Khasiae" [lives at Teria Ghát, Khasia hills]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. Blanford and Godwin-Austen (1908: 252) mentioned that "Benson's type from Teria Ghat measured 4½ x 4 x 4 mm". This species is the most widespread member of the genus, occurring from NE India to Burma (Godwin-Austen, 1907 [in 1897–1914]: 219); it has recently been recorded in Bhutan (Gittenberger et al., 2017a, b).

Rahula (*Rahula*) *corys* (Benson, 1859)

Helix corys Benson, 1859h: 265
Rahula corys (Benson); Godwin-Austen, 1907 [in 1897–1914]: 218, Fig. 1 (type), Fig. 4; Blanford and Godwin-Austen, 1908: 251, Fig. 82A (type), Figs 82D–E (specimens from Damsang); Ramakrishna et al., 2010: 233 (as "*Rahula coryx*"); Gittenberger et al., 2017b: 415
Type material NHMUK 1906.2.1.156, **Fig. 92 C** (holotype from the W.T. Blanford collection labelled "Darjiling")
Original measurements: "Diam. 2, long. 3 mill."4
Type locality India: "Habitat in valle Rungun, prope Darjiling, rarissime occurens" [lives in the Rungun Valley, near Darjiling, occurs very rarely]
Remarks Benson based his original description on a single dead specimen provided by W.T. Blanford. Blanford and Godwin-Austen (1908: 250) noted that the type of *H. corys* had "suffered much since Benson described it", now being only 2 mm. in length with both the aperture and last whorls missing. They nevertheless thought that it was distinct from *macropleuris* in being "distinctly filose at the suture, even at the third whorl; and the side of the spire is flatter..."

Rahula (*Rahula*) *macropleuris* (Benson, 1859)

Helix macropleuris Benson, 1859h: 265; Pfeiffer, 1868 [in 1847–1877]: 183; Hanley and Theobald, 1874 [in 1870–1876]: 37, Pl. 87, Fig. 10
Nanina (*Microcystis* ?) *macropleuris* (Benson); Nevill, 1878: 41
Rahula macropleuris (Benson); Godwin-Austen, 1907 [in 1897-1914]: 216, Pl. 103, Fig. 1; Blanford and Godwin-Austen, 1908: 249, Fig. 82B–C; Ramakrishna et al., 2010: 234; Gittenberger et al., 2017b: 415
Type material a neotype (NHMUK 1906.2.2.155/1, **Fig. 92 D**) is hereby designated from a series of three shells from the W.T. Blanford collection labelled "Darjiling Rungun"; the chosen shell is the one illustrated by Hanley and Theobald (1874 [in 1870–1876]). We have designated a neotype with the express purpose of clarifying the taxonomic status of *R. macropleuris* (see below).
Original measurements: "Diam. major 5, minor 4½, long. 5½ mill."
Other material NHMUK 20210288 (three shells from the A.S. Kennard collection labelled "*Rahula macropleuris* Benson, Darjeeling, ex. auct."); NHMUK 1903.viii.i.685 (single shell from the H.H. Godwin-Austen collection labelled "*Rahula macropleuris* Benson, Darjiling, 6500 f., ex. Mus. Calcutta")
Type locality India: "Habitat in valle Rungun, prope Darjiling, rarissime" [lives in the Rungun Valley, near Darjiling, very rarely]
Remarks Benson based his original description on one shell: "The aperture of the single dead specimen collected by W.T. Blanford is not in the best condition." This species is the type of *Rahula* Godwin-Austen, 1907 by original designation.

Genus *Sesara* Albers, 1860

Sesara ? *diplodon* (Benson, 1859)

Helix diplodon Benson, 1859e: 187; Pfeiffer, 1868 [in 1847–1877]: 256; Hanley and Theobald, 1872 [in 1870–1876]: 27, Pl. 60, Fig. 8
Nanina (*Sesara* ?) *diplodon* (Benson); Nevill, 1878: 53

Helix (*Patula*) *diplodon* Benson; Tryon, 1887: 69, Pl. 13, Fig. 61
Sesara ? *diplodon* (Benson); Blanford and Godwin-Austen, 1908: 247; Ramakrishna et al., 2010: 219
Type material UMZC I.102505.A, **Fig. 92 E** (one of three syntypes from the R. McAndrew collection labelled "*Trochomorpha Diplodon* Bens., Bens. col., India")
Original measurements: "Diam. major 6½, minor 5½, alt. 5 mill."
Other material NHMUK 1888.12.4.522, **Fig. 92 F** (single shell from the W. Theobald collection labelled "*H.* (*Rotula*) *diplodon* Benson (typical), Khasi Hills")
Type locality India: "Habitat in montibus Khasiae, prope Teria Ghat, versus orientem" [lives in the Khasia Hills, near Teria Ghat, towards the east]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. According to Ramakrishna et al. (2010), *S. diplodon* also occurs in Bangladesh and Burma.

Helix capessens Benson, 1856

Accepted as *Sesara infrendens* (Gould, 1844);
Helix infrendens Gould, 1844b: 453, Pl. 24, Fig. 6

Helix capessens Benson, 1856f: 250; Theobald, 1857: 249; Pfeiffer, 1859 [in 1847–1877]: 194; Pfeiffer, 1860 [in 1854–1869], 1, 133: Pl. 36, Figs 17–20; Hanley and Theobald, 1872 [in 1870–1876]: 27, Pl. 60, Fig. 5
Nanina (*Sesara*) *capessens* (Benson); Blanford, 1863b: 84; Nevill, 1878: 53
Type material UMZC I.103040.A, **Fig. 93 A** (one of three syntypes from the McAndrew collection labelled "*Anchistoma Capessens* Bens., Bens. col., Moulmein")
Original measurements: "Diam. major 9, minor 8, axis 4 mill."
Other material NHMUK 1906.2.2.137 (single shell from the W.T. Blanford collection labelled "*Sesara capessens* Bs., Moulmein, var of *infrendens* G.")
Type locality Burma: "ad Maulmain. Teste W. Theobald" [at Maulmain, according to W. Theobald]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. Blanford and Godwin-Austen (1908: 243) listed *capessens* as a synonym of *Sesara infrendens* (Gould, 1844), noting that the apertural teeth are equidistant, as they are in *infrendens*.

Sesara pylaica (Benson, 1856)

Helix pylaica Benson, 1856f: 249; Theobald, 1857: 249; Pfeiffer, 1859 [in 1847–1877]: 164; Benson, 1859i: 95; Hanley and Theobald, 1870 [in 1870–1876]: 8, Pl. 15, Fig. 2; Stoliczka, 1871: 245
Nanina (*Sesara*) *pylaica* (Benson); Blanford, 1863b: 84; Nevill, 1878: 53
Nanina (*Sessara* [sic]) *pylaica* (Benson); Tryon, 1886: 132, Pl. 43, Fig. 44
Sesara pylaica (Benson); Blanford and Godwin-Austen, 1908: 245
Type material UMZC I.102940.A, **Fig. 93 B** (one of six syntypes from the R. McAndrew collection labelled "*Anchistoma Pylaica* Bens., Bens. col., Burmah")
Original measurements: "Diam. major 8, minor 9, axis 5 mill."
Other material NHMUK 1888.12.4.44–48 (five shells from the W. Theobald collection labelled "*Sesara pylaica* Benson, Moulmein"); NHMUK 1888.12.4.486–488 (three shells from the W. Theobald collection labelled "*H.* (*Sesara*) *pylaica* Benson, Moulmein"); BRSMG A.2500/O.C. 1881 (four shells presented by W. Theobald labelled "*Stenotrema pylaica* Bens, Maulmein"); NHMUK 1954.6.2.246–247 (two shells from the J.S. Hawkins collection labelled "*Helix pylaica* Benson, Paratypes, Maulmain [Moulmain], Burma, Theobald juv."); NHMUK 1906.2.2.135 (four shells from the W.T. Blanford collection labelled "*Sesara pylaica* Bs., Moulmein")
Type locality Burma: "ad Maulmain. Teste W. Theobald" [at Maulmain, according to W. Theobald]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. Theobald (1857: 249) noted that "this curious little shell" was common. Benson (1859i: 95) subsequently provided a description of the animal based on three living examples provided by Richard Sankey. The specimens from the Hawkins collection, which come from the type locality, are incorrectly labelled as "paratypes" since a manuscript list detailing a collection of specimens from Moulmein sent to Hawkins by Col. Robert Gordon (MSS_ZOO_HAW) indicates that Gordon, rather than Theobald, was the source of these specimens. They are therefore not part of the type series.

Family UROCYCLIDAE

Subfamily SHELDONIINAE [62]

Genus *Sheldonia* Ancey, 1887

Sheldonia capsula (Benson, 1864)

Helix capsula Benson, 1864b: 492
Hyalinia capsula (Benson); Tryon, 1886: 176
Sheldonia capsula (Benson); Connolly, 1939: 124
Type material UMZC I.104335.A, **Fig. 93 F** (one of two syntypes labelled "*Nanina capsula* Bens., Simon's Bay, No similar specimens in the British Mus., Benson Coll., E.R. Sykes, Oct. 26, 1897", **Fig. 93 G**)

Original measurements: “Diam. major 13, minor 10, axis 6 mill.”
Other material NHMUK 1954.6.2.117, **Fig. 93 H** (one of two shells from the J.S. Hawkins collection labelled “*Helix capsula* Benson, Simons Town, S. Africa, G.W. Browning 1862”).
Type locality South Africa: “Habitat prope Simon's Bay. Occurs in a ravine behind the Admiralty House, Simonstown” [lives near Simon’s Bay…]
Remarks The number of specimens provided by Edgar Layard was not noted in Benson’s original description. The NHM specimens in the Hawkins collection were provided by G.W. Browning and are therefore not part of the type series.

Sheldonia cotyledonis (Benson, 1850)

Helix cotyledonis Benson, 1850a: 216; Reeve, 1852 [in 1851–1854], 7 (*Helix*): pl. 124, figs a, b, species 740; Pfeiffer, 1853 [in 1853–1854], 1(12$_3$), 376, pl. 141, figs 3–4
Peltatus cotyledonis (Benson); Godwin-Austen, 1912: 134; Connolly, 1912: 105
Sheldonia cotyledonis (Benson); Connolly, 1939: 131
Type material UMZC I.103590.A, **Fig. 94 A** (one of two syntypes from the R. McAndrew collection labelled “*Cysticopsis Cotyledonis* Bens. Var., Bens. col., Cape G.H. [Cape of Good Hope]"); NHMUK 1859.10.12.22, **Fig. 94 B** (one of three syntypes collected by McGillivray labelled "Simons Bay, Cape of G. Hope (alive)”, presented by the Museum of Economic Geology)
Original measurements: “Diam. major 16, minor 14, axis 9 mill.”
Other material UMZC I.104220 (five shells from the R. McAndrew collection labelled “*cotyledonis* Bens.”, no collection or locality data); NHMUK 1954.6.2.148–151 (five shells from the J.S. Hawkins collection labelled "*Helix cotyledonis* Benson, ? Paratypes, Simons Town, S. Africa, June 1859")
Type locality South Africa: “Hab. prope Simon’s Bay, P.B.S.” [lives near Simon’s Bay, Cape of Good Hope]
Remarks Benson (1850a: 216) based his description on at least six specimens, three of which were in the BM: “I got a single fresh and perfect example [1] ... Weathered shells [2+], which were whitish, occurred in the drifting sands... There is a single bad specimen [1] ... in Case 25 of the British Museum collection ... and in Case 26 are two smaller examples ... [2]”. The last three are the shells presented by Professor M’Gillivray (NHMUK 1859.10.12.22). Connolly (1912: 105) stated that the original specimens were in the UMZC. There is no indication that UMZC I.104220 originated from the Benson collection, although this is likely, so we do not include it in the known type series material. The same applies to NHMUK 1954.6.2.148–151.

Sheldonia hudsoniae (Benson, 1864)

Helix hudsoniae Benson, 1864b: 493
Peltatus hudsoniae (Benson); Godwin-Austen, 1908c: 131; Connolly, 1912: 105
Sheldonia hudsoniae (Benson); Connolly, 1939: 129
Material UMZC I.103370.A, **Fig. 93 E** (one of six shells from the R. McAndrew collection labelled “*Microcystis*? *Hudsoni* Bens., Bens. col., Cape G.H.” [Cape of Good Hope]); NHMUK 1873.1.21.3 (three shells presented by R. McAndrew labelled "*Helix Hudsoni* Benson, Cape of Good Hope”)
Original measurements: “Diam. major 12½, minor 10½, axis 7 mill.”
Type locality South Africa: “Habitat ad Riversdale” [lives at Riversdale]
Remarks Benson’s type series consisted of “a single full-grown specimen, with the young”, received from Mrs. J.F. Hudson. Godwin-Austen (1912: 129) thought that the lot of three shells presented to the BM by Robert McAndrew represented the type series, a view echoed by Connolly (1912: 106; 1939: 130). These specimens are not labelled as coming from the Benson collection, although this is the most likely source. The type series cannot be identified with certainty because the UMZC lot contains more than one adult shell. Godwin-Austen (1908c) designated *Helix hudsoniae* as the type species of *Peltatus* Godwin-Austin, 1908, but his description was based on specimens from Port Elizabeth, which he later stated that he had misidentified (Godwin-Austen, 1912: 129) for "*Peltatus aloicola* M. & P." [i.e. *Vitrina huttoniae* var. *aloicola* Melvill & Ponsonby, 1890], listing this as the type of *Peltatus*.

Sheldonia phytostylus (Benson, 1864)

Helix phytostylus Benson, 1864b: 492; Watson, 1934: 190
Hyalinia phytostylus (Benson); Tryon, 1886: 176
Peltatus phytostylus (Benson); Connolly, 1912: 105
Sheldonia phytostylus (Benson); Connolly, 1939: 126
Type material a neotype (UMZC I.103125.A, **Fig. 94 C**) is hereby designated from a series of six shells in the R. McAndrew collection labelled “*Helix Phytostylus* Bens., Cape G.H. [Cape of Good Hope]", no collection data). We have designated a neotype with the express purpose of clarifying the taxonomic status of *S. phytostylus* (see below).
Original measurements: “Diam. major 16, minor 14, axis 12 mill.”
Other material NHMUK 1873.1.21.2 (four shells, one larger than the other three, presented by Robert

McAndrew labelled "*Helix phytostilus* [sic] Bs., Cape of Good Hope"); NHMUK 1912.8.16.277, **Fig. 94 D** (one of two shells from the E.L. Layard collection labelled "*Zingis phytostylus*, S. Africa, Benson's types")
Type locality South Africa: "ad Colesberg, et prope Riversdale" [at Colesberg, and near Riversdale]
Remarks Benson (1864b: 492) based his description on at least three specimens: "A single specimen from Colesberg was sent for examination by Mr E. Layard. Subsequently, I received from Riversdale, in the east part of Swellendam, specimens in various stages of growth, collected by a relative, Mrs. J.F. Hudson". In a letter to J.S. Hawkins dated 30thApril 1864 (ZOO_MSS_HAW), Benson discussed this species and noted "I have to return the single sp^{n} which E. Layard sent". One of the two specimens from the Layard collection (NHMUK 1912.8.16.277–278) is probably therefore a syntype, although it cannot be identified with certainty. Connolly (1912: 107; 1939: 127) stated that the "Type" is in the BM, presumably referring to the specimens presented by Robert McAndrew (NHMUK 1873.1.21.2), since Connolly's paper was published on October 24th 1912 and the material from Edgar Layard's collection had only been registered by the BM(NH) in August of that year. The McAndrew specimens were presented with five other lots of Benson taxa, all of which presumably originated from the Benson collection, although the surviving labelling does not corroborate this. Because none of the surviving lots are clearly labelled as coming from the Benson collection (although this is their probable source), and the identity of the syntype examined by Benson in Edgar Layard's collection is unclear, we have therefore designated a neotype.

Sheldonia trotteriana (Benson, 1848)

Helix trotteriana Benson, 1848b: 161; Reeve, 1852 [in 1851–1854], 7 (*Helix*): pl. 124, species 745
Peltatus trotterianus (Benson); Connolly, 1912: 107
Sheldonia trotteriana (Benson); Connolly, 1939: 123
Type material UMZC I.102395.A, **Fig. 94 E** (one of five syntypes from the R. McAndrew collection labelled "*Helix* (*Cystocopsis*) *Trotteriana* Bens., Bens. Col., Algoa Bay". Another label reads "*H. Trotteriana* Bens., Algoa Bay, Type"); NHMUK 20190443, **Fig. 94 F** (syntype from the J.S. Hawkins collection labelled "*Helix Trotteriana* Bens., Cape S.A. [South Africa], Uitenhage, Cape Province, W.H. Benson", accompanied by a label in Benson's handwriting that reads "*Helix trotteriana* Bens., Uitenhage, Karroo")
Original measurements: "Diam. major 19 ½ mill., minor 17. Axis 12 mill. Mus. nost., Cuming, &c." [my collection, Cuming's collection, etc.]
Other material NHMUK 1873.1.21.4 (three shells presented by Robert McAndrew labelled "*Helix Trotteriana* Benson, Algoa Bay"; the word "?type" was added later); NHMUK 1912.8.16.198–199 (two shells from the E.L. Layard collection labelled "*Zingis trotteriana*, Bokkevelt, S. Africa, Benson's types")
Type locality South Africa: "It was taken alive near Uitenhage, South Africa, on the route from Graaf Reynett, by Robert Trotter, Esq., Bengal Civil Service …"
Remarks The number of specimens provided by Robert Trotter was not noted in Benson's original description, which was based on Trotter's shells and specimens in the Cuming collection, which could not be traced. The town of Uitenhage is just inland of Algoa Bay and therefore the latter is consistent with Benson's type locality. It is likely that the specimens donated to the BM by Robert McAndrew (NHMUK 1873.1.21.4) also originated from Benson's collection, although this is not stated on the labels and cannot be confirmed. Connolly (1939: 123) stated that the "type" of this species was in the BM(NH), although it is not clear to which specimen he was referring. The shells from Edgar Layard's collection are labelled "Benson's types", but the given locality of "Bokkevelt" is in the Western Cape and so they cannot form part of the type series. *Helix trotteriana* is the type species of *Sheldonia* Ancey, 1887 by subsequent designation (Connolly, 1925: 467), and *Sheldonia* is the type genus of the subfamily Sheldoniinae.

Genus *Microkerkus* Godwin-Austen, 1912

Microkerkus arnotti (Benson, 1864)

Helix arnotti Benson, 1864b: 491
Nanina arnotti (Benson); Tryon, 1886: 87
Peltatus arnotti (Benson); Connolly, 1912: 104
Sheldonia arnotti (Benson); Connolly, 1939: 125
Microkerkus arnotti (Benson); Herbert, 2017: 28
Type material UMZC I.103155.A, **Fig. 93 C** (one of two syntypes from the R. McAndrew collection labelled "*Nanina Arnotti* Bens., Bens. Col., Cape G.H". [Cape of Good Hope]; "*Peltapus*" has been added in other handwriting, **Fig. 93 D**)
Original measurements: "Diam. major 15 ½, minor 13, axis 9 mill."
Other material NHMUK 1954.6.2.134–135 (two shells from the J.S. Hawkins collection labelled "*Helix arnotti* Benson, Paratypes, Colesberg, S. Africa, D. Arnott")
Type locality South Africa: "prope Colesberg. Detexit D. Arnott" [near Colesberg. Discovered by D. Arnott]
Remarks The number of specimens provided by David Arnot (note spelling) was not noted in Benson's original description. Connolly (1912: 104; 1939: 125) stated that the type is in the BM(NH), although it is not

clear to which specimen he was referring. The Hawkins specimens, which he acquired from Arnot, are from the type locality but there is no evidence that they were part of Benson's type series. Herbert (2017: 28) included *arnotti* in the recently resurrected genus *Microkerkus* Godwin-Austen, 1912, which he distinguished from *Kerkophorus* Godwin-Austen, 1912 and other members of *Sheldonia s.l.* on the basis of consistent differences in the morphology of the male genitalia.

Infraorder HELICOIDEI

["HELICOID CLADE"]

Superfamily HELICOIDEA

Family CAMAENIDAE[63]

Subfamily CAMAENINAE

Genus *Amphidromus* Albers, 1850

***Amphidromus sinensis* (Benson, 1851)**

Bulimus sinensis Benson, 1851a: 264; Pfeiffer, 1853 [in 1840–1865], I.(13.$_1$), 67: pl. 20, figs 1–2; Blanford, 1865: 94

Amphidromus sinensis (Benson); Nevill, 1878: 126; Pilsbry, 1900: 190, pl. 62, figs 64, 65; Gude, 1914a: 182; Richardson, 1985: 43; Ramakrishna et al., 2010: 322

Material UMZC I.104925.A, **Fig. 95 B** (one of three shells from the R. McAndrew collection labelled "*Cochleostyla (Canistrum) Sinensis* Bens., Bens. Col., China")

Original measurements: "Long. 30, lat. 18 mill.; long. apert. 16, lat. 12 mill."

Type locality China: "Hab. in Imperio Sinensi australi" [lives in the south of the Chinese Empire]

Remarks Benson based his original description on a single shell "Received by Dr. Cantor, to whom I am indebted for the specimen, from the south of China". He also later remarked that "…the original specimen was obtained by the lamented Dr. Theodore Cantor" and that additional specimens of the "larger 2-banded variety" had been obtained by Captain Haughton at Sheoay-Gheen, Pegu (Benson, 1860c: 195). There are two letters regarding these shells in the archives of the UMZC, both from Edgar A. Smith of the BM(NH) to Dr. Sharpe. The first simply requests their loan, but in the second (dated 26th August 1895), Smith opined that "None of them however can be Benson's type, as they do not agree with his details really, nor with the figure of it given by Pfeiffer" and wondered whether the specimen was ever returned by Pfeiffer to Benson after figuring. Pilsbry (1900: 191) made a similar suggestion, considering the possibility that the holotype was retained by Pfeiffer and survived in Dohrn's collection; Gude (1914a: 183) also entertained this idea, although he went on to say that since Pfeiffer distinctly stated that the type was in the Benson collection (Mon. Helic. Viv. Iii, 1853, p. 320), a more likely explanation was that the shell had simply been lost during its turbulent history. The Cambridge specimens are clearly labelled as coming from "China", although it is more likely that they represent the shells collected by Captain Haughton in Burma (see above); they lack the dark band around the aperture clearly mentioned in Benson's original description and shown in Pfeiffer's figure of the holotype (**Fig. 95 A**) and have been suggested to represent *Amphidromus sinensis vicaria* Fulton (Zheyu Chen, *pers. comm*.). The known range of this species includes localities in southern China, Burma and northeast India (Gude, 1914a: 182) and has recently been extended into peninsular India (Tripathy et al., 2018).

***Bulimus theobaldianus* Benson, 1857**

Accepted as *Amphidromus moniliferus* (Gould, 1846); *Bulimus moniliferus* Gould, 1846: 99

Bulimus theobaldianus Benson, 1857a: 329; Theobald, 1857: 252; Hanley and Theobald, 1870 [in 1870–1876]: 10, Pl. 19, Fig. 10; 1876 [in 1870–1876]: xi

Amphidromus theobaldianus (Benson); Theobald, 1876b: 187, Pl. 14, Fig. 8; Sutcharit et al., 2015: 94, Fig. 15D

Type material not located

Original measurements: "Long. 15, diam. 9 mill."

Other material NHMUK 1907.11.21.64, **Fig. 95 B** (single shell from the S. Hanley collection labelled "*Amphidromus theobaldianus*, Tenasserim, from Hanley coll. Fig^{d} in Con. Ind. Pl. 19, Fig. 10")

Type locality Burma: "Hab. Raro ad Yanglaw, Tenasserim. Teste W. Theobald" [lives rarely at Yanglaw, Tenasserim, according to W. Theobald]

Remarks The original description appears to have been based on a single specimen. Benson stated "peristomate tenui?" [=peristome thin?], and Theobald (1857: 252) reported that the species was "very rare", later noting that it had been "… described by Benson from an imperfect example" (Theobald, 1876b: 187). Taken together, these comments imply that the type series consisted of a single, immature shell. NHMUK 1907.11.21.64 is the juvenile specimen figured in Hanley and Theobald (1870 [in 1870–1876]). This shell is from the type locality but because it is somewhat larger (measuring 22.3 mm x 12.4 mm) than the dimensions given in Benson's description, Sutcharit et al. (2015) refrained from designating it as the lectotype. Gude (1914a: 180) regarded *B. theobaldianus* as a junior synonym of *Amphidromus moniliferus* (Gould, 1846).

Genus *Beddomea* G. Nevill, 1878 [64]

Beddomea physalis (Benson, 1857)

Bulimus physalis Benson, 1857a: 328; Hanley and Theobald, 1870 [in 1870–1876]: 11, Pl. 21, Fig. 9
Amphidromus (*Beddomea*) *physalis* (Benson); Nevill, 1878: 127; Pilsbry, 1901: 8, Pl. 1, Fig. 13; Gude, 1914a: 189
Beddomea physalis (Benson); Richardson, 1985: 63; Ramakrishna et al., 2010: 324; Raheem et al., 2014: 109, Fig. 69B–C
Type material UMZC I.102805.A, **Fig. 95 C** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 109–110) from the R. McAndrew collection labelled "*Cochlostyla* (*Canistrum*) *Physalis* Bens., E. Ind."); UMZC I.102805.B, **Fig. 95 D** (one of two paralectotypes, one adult and one juvenile, from the same lot)
Original measurements: "Long. 27–28, diam. 16–17 mill.; long. Apert. 14–16, lat. 9–10 mill."
Type locality India: "Hab. ad Khoonda Ghát, Montium Nilgherries, Indiae Australis. Teste T. Jerdon" [lives at Khoonda Ghát, Nilgiri Hills, southern India, according to T. Jerdon]
Remarks Benson based his original description on three specimens. One of these was "a perfect specimen, in the Museum of the India House" (i.e. the EIC's India Museum on Leadenhall Street, London). The other two were a juvenile and an adult, both received from Thomas Jerdon. We assume that the specimen in the India Museum remained there, meaning that of the three specimens in the UMZC only the juvenile shell is unequivocally part of the type series. *Beddomea physalis* is endemic to the Western Ghats (Raheem et al., 2014).

Beddomea fuscoventris (Benson, 1856)

Accepted as *Beddomea trifasciata* Gmelin, 1790; *Helix trifasciata* Gmelin, 1790, vol. 1 (6): 3642

Bulimus fuscoventris Benson, 1856d: 96
Type material UMZC I.103010, **Figs 95 E–F** (two of five syntypes from the R. McAndrew collection labelled "*Bulimus* (*Canistrum*) *Fuscoventris* Bens., F. Layard, Ceylon". Another label in Benson's handwriting reads "*B. ceylanicus* I [?] L Layard")
Original measurements: "Long. 25, diam. 13, apert. 12 longa, 9½ mill. lata."
Type locality Sri Lanka: "Hab. in Insula Ceylon. Teste F. Layard" [Lives on the island of Ceylon according to F. Layard]
Remarks The number of specimens provided by Frederick Layard was not noted in Benson's original description. He implied that there might only have been one specimen: "This shell is not in good condition, and the surface and colour may be somewhat different in perfect specimens", although the wording is ambiguous. Benson's label attributing this specimen to "*Bulimus ceylanicus*" suggests that he accepted the synonymy of *fuscoventris* with *B. ceylanicus*, now recognized as a synonym of *Helix trifasciatus* Gmelin, 1790 (= *Beddomea trifasciata*; see Gude (1914a: 187), although he appears to have misremembered the source of the shell as Edgar rather than Frederick Layard.

Beddomea trifasciatus rufopicta (Benson, 1856)

Bulimus rufopictus Benson, 1856d: 96; Hanley and Theobald, 1870 [in 1870–1876]: 11, Pl. 21, Fig. 10
Buliminus (*Cerastus*) *rufopictus* (Benson); Nevill, 1878: 132
Amphidromus (*Beddomea*) *trifasciatus* var *rufopictus* (Benson); Pilsbry, 1901: 5, Pl. 1, Fig. 9
Amphidromus (*Beddomea*) *trifasciatus* var. *rufopicta* (Benson); Gude, 1914a: 188
Beddomea trifasciatus var. *rufopicta* (Benson); Naggs and Raheem, 2000: Fig. 151
Type material UMZC I.103060.A–B, **Figs 96 A–B** (two syntypes from the R. McAndrew collection labelled "*Cochlostyla* (*Canistrum*) *Rufopictus* Bens., Bens. col., Ceylon")
Original measurements: "Long. 20, diam. 11½, apert. 9 longa, 7½ mill. lata."
Other material NHMUK 1954.6.2.863–864 (two shells from the J.S. Hawkins collection labelled "*Bulimus rufopictus* Benson, Paratypes, Ahuramboddi, Ceylon, F. Layard"); BRSMG Aa.51/O.C. 2193 (five shells from the F. Layard collection labelled "*rufopictus* Benson, Ceylon, Pres[d] by F. Layard Esq.")
Type locality Sri Lanka: "Hab. in Insula Ceylon" [lives on the Island of Ceylon]
Remarks The number of specimens provided by Frederick Layard was not noted in Benson's original description. The larger UMZC specimen most closely approaches the measurements given by Benson. This subspecies (i.e. *rufopicta*) is smaller than the nominate subspecies, often with the upper whorls transversely streaked.

Genus *Bouchetcamaena* Thach, 2018

Bouchetcamaena delibrata (Benson, 1836)

Helix delibratus Benson, 1836a: 352
Helix delibrata Benson; Theobald, 1857: 250; Hanley and Theobald, 1870 [in 1870–1876]: 7, Pl. 14, Fig. 10
Helix (*Trachia* [as *Tachia*]) *delibrata* Benson; Blanford, 1863b: 85

Trachia delibrata (Benson); Stoliczka, 1871: 225, pl. 16, figs 1–3
Helix (*Planispira*) *delibrata* (Benson); Nevill, 1878: 76
Helix (*Plectotropis* (*Trachia*)) *delibrata* Benson; Tryon, 1888a: 64, Pl. 14, Fig. 75
Planispira (*Trachia*) *delibrata* (Benson); Pilsbry, 1894 [in 1893–1895]: 116, pl. 32, figs 44, 45
Chloritis (*Trichochloritis*) *delibrata* (Benson); Gude, 1914a: 172; Richardson, 1985: 92; Ramakrishna et al., 2010: 326
Bouchetcamaena delibrata (Benson); Páll-Gergely et al., 2022: 10
Type material UMZC I.102050, **Fig. 97 B** (syntype from the R. McAndrew collection labelled "*Lucerna* (*Obba*) *Delibrata* Bens., Bens. col., Bengal")
Original measurements: "Diam. 0.9 poll."
Type locality India/Bangladesh: part of a collection "chiefly made in the hills on the N.E. Frontier of Bengal"
Remarks The number of specimens examined was not noted in Benson's original description, which was based on material in the Museum of the Asiatic Society acquired from an expedition to "Sylhet, Cherra Poonji and the Khasi Hills" (Pearson, 1833). Nevill (1878: 76) listed three shells in the Indian Museum labelled "Sylhet (type); ex c. As. Soc., Bengal", which are also likely to be syntypes. Gude (1914a: 172) commented that Benson's original diagnosis was very short and it might equally apply to several allied forms. He provided an extended diagnosis based on specimens from the Khasi Hills and recognized three named varieties (var. *fasciata* Godwin-Austen, 1875a, var. *khasiensis* G. Nevill, 1877, and var. *procumbens* Gould, 1844 from Dawei, Burma. Páll-Gergely et al. (2022) provisionally transferred the entire *Chloritis delibrata* group to *Bouchetcamaena*, except var. *fasciata*, which was transferred to *Burmachloritis* Godwin-Austen, 1920. Theobald (1857: 250) recorded *delibrata* from Burma, noting that it appeared to have a very wide distribution, and it has recently been recorded from Bhutan (Gittenberger et al., 2017a).

Genus *Camaena* Albers, 1850

Camaena ochthoplax (Benson, 1860)

Helix ochthoplax Benson, 1860c: 190; Hanley and Theobald, 1870 [in 1870–1876]: 13, Pl. 26, Fig. 4 (as *octhoplax*)
Nanina (*Oxytes*) *ochthoplax* (Benson); Tryon, 1886: 129, Pl. 43, Fig. 30
Helix (*Camaena*) *ochthoplax* Benson; Tryon, 1890: 202, pl. 61, figs 23, 24
Helix (*Eucochlias*) *ochthoplax* (Benson); Nevill, 1878: 81; Godwin-Austen, 1895c: 152, Pl. 7, Fig. 1
Camaena ochthoplax (Benson); Pilsbry, 1894 [in 1893–1895]: 104; Gude, 1914a: 150; Richardson, 1985: 76; Ramakrishna et al., 2010: 321
Type material NHMUK 1888.12.4.2003, **Fig. 96 C** (holotype from the W. Theobald collection labelled "*Helix* (*Eucochlias*) *ochthoplax* Benson, Khasi Hills")
Original measurements: "Diam. major 54, minor 46, axis 26 mill."
Other material NHMUK 1906.1.1.720, **Fig. 96 D** (single shell from the W.T. Blanford collection labelled "*Eucochlias ochthoplax* Bs., Moyong, N. scarp, Khasi Hills"; this is the specimen figured by Hanley and Theobald, 1870)
Type locality Burma: "Habitat in regione Pegu" [lives in the Pegu region]. Probably an error, see below.
Remarks Benson based his description on a single shell provided by William Theobald, which was described as being "slightly weathered, and has received injuries which the animal has partially repaired". NHMUK 1888.12.4.2003 closely matches this description, with various cracks to the body-whorl and repaired damage to the lip of the aperture; it is also a precise match to Benson's published measurements and is therefore accepted as the holotype. Although the type locality was given as "Pegu", neither Theobald, Blanford nor Fedden ever found this species in Burma, raising suspicions that Benson had made a mistake in his original description (see Godwin-Austen, 1895c: 152 and Gude, 1914a: 151). In India, Ramakrishna et al. (2010) recorded this species from Arunachal Pradesh, Assam and Meghalaya; its occurrence in Burma requires confirmation. Nevill (1878: 81) assigned *Helix ochthoplax* to *Eucochlias* as its type species, although he attributed this name to Theobald MS. *Eucochlias* G. Nevill, 1878 is now regarded as a synonym of *Camaena* Albers, 1850 (Tryon, 1890: 202).

Genus *Chloritis* H. Beck, 1837

Subgenus *Chloritis* H. Beck, 1837

Chloritis (*Chloritis*) *bifoveata* (Benson, 1856)

Helix bifoveata Benson, 1856f: 251; Hanley and Theobald, 1870 [in 1870–1876]: 7, Pl. 14, Fig. 8
Semicornu bifoveatum (Benson); Theobald, 1882 [in 1882–1883]: 175
Helix (*Chloritis*) *bifoveata* Benson; Tryon, 1890: 245, Pl. 50, Fig. between 36 and 42
Chloritis (*Trichochloritis*) *bifoveata* (Benson); Pilsbry, 1894 [in 1893–1895]: 124
Chloritis bifoveata (Benson); Gude, 1914a: 167
Chloritis (*Chloritis*) *bifoveata* (Benson); Richardson, 1985: 87
Chloritis (?) *bifoveata* (Benson); Páll-Gergely and Neubert, 2019: 147

Type material a neotype (NHMUK 1888.12.4.1454, **Fig. 97 A)** is hereby designated from the W. Theobald collection labelled "*H. bifoveata* Benson, Tenasserim Valley"). We have designated a neotype with the express purpose of clarifying the taxonomic status of *C. bifoveata* (see below).
Original measurements: "Diam. major 10, minor 9, axis 6 mill. Long. apert. 7, lat. vix 2 mill."
Type locality Burma: "Hab. ad collem Therabuin vallis Tenasserim raro. Detexit W. Theobald" [lives at Therabuin hill, Tenasserim valley, rare. Discovered by W. Theobald]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. However, Theobald (1857: 250) listed "*H. biforcata* B." (clearly a mis-transcription of *bifoveata*) from "Therabuin Hill" amongst material he had provided to Benson, noting that it was "a most singular shell, of which but one adult specimen was procured", and much later remarked "A single adult shell was all that I found of this remarkable form" (Theobald, 1882: 175). It therefore appears that only one specimen was ever collected. The holotype could not be found in the UMZC, despite the presence of an entry in Robert McAndrew's manuscript *Catalogue* for "*Drepanostoma bifoveata*, Tenasserim". The NHM specimen from the Theobald collection is from the type locality but is significantly larger than the dimensions provided in Benson's description. Sutcharit and Panha (2010) provided a taxonomic re-evaluation of this species, characterized by its extraordinary biconcave shell covered in periostracal hairs. They also reported new distributional records from northern peninsular Malaysia and southern Thailand, where *C. bifoveata* occurs around heavy, decayed logs or tree stumps in moist evergreen forest. Further information on the genitalia of *C. bifoveata* was provided by Páll-Gergely and Neubert (2019), who also noted that the strongly hairy shell is not characteristic of *Chloritis*. A subspecies identified in Vietnam (*Chloritis bifoveata vinhensis* Thach & Huber, 2018) has recently been elevated to species level (Páll-Gergely et al., 2020d).

Subgenus *Trichochloritis* Pilsbry, 1891

Chloritis (*Trichochloritis*) *cyclotrema* (Benson, 1863)

Helix cyclotrema Benson, 1863a: 88; Hanley and Theobald, 1870 [in 1870–1876]: 14, Pl. 28, Fig. 10
Nanina (*Ariophanta*) *cyclotrema* (Benson); Tryon, 1886: 17, Pl. 2, Fig. 22
Chloritis (*Trichochloritis*) *cyclotrema* (Benson); Gude, 1914a: 175; Richardson, 1985: 92; Ramakrishna et al., 2010: 325 (as "*Chloritis cyclostrema*")
Type material UMZC I.104320, **Fig. 97 C** (syntype from the R. McAndrew collection labelled "*Ariophanta Cyclotrema* Bens = *Saccata* Pfr? Bens. col., Ind.")
Original measurements: "Diam. major 22, minor 18, axis 11 mill."
Other material NHMUK 1888.12.4.572, **Fig. 97 D** (single shell from the W. Theobald collection labelled "*H.* (*Ariophanta*) *cyclotrema* Benson, Sumeysar Hills")
Type locality "Habitat in montibus "Soomeysur" dictis, prope regionem Nipalensem. Detexit W. Theobald jun." [lives in the so-called "Soomeysur" mountains, near the region of Nepal. Discovered by W. Theobald jun.]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description.

Chloritis (*Trichochloritis*) *helferi* (Benson, 1860)

Helix helferi Benson, 1860c: 191; Hanley and Theobald, 1870 [in 1870–1876]: 14, pl. 29, figs 8, 9
Helix (*Tachia*) *helferi* Benson; Blanford, 1863b: 85
Helix (*Planispira*) *helferi* Benson; Nevill, 1878: 77
Helix (*Plectotropis* (*Trachia*)) *helferi* Benson; Tryon, 1888a: 63, pl. 14, figs 59, 60
Planispira (*Trachia*) *helferi* (Benson); Pilsbry, 1894 [in 1893–1895]: 116
Planispira helferi (Benson); Godwin-Austen, 1895a: 442, 449
Chloritis (*Trichochloritis*) *helferi* (Benson); Gude, 1914a: 170; Richardson, 1985: 98; Ramakrishna et al., 2010: 327
Type material UMZC I.103410.A, **Fig. 97 E** (holotype from the R. McAndrew collection labelled "*Campylaea Helferi* Bens., Bens. col., Andeman I.")
Original measurements: "Diam. major 12, minor 10, axis 6 mill."
Other material UMZC I.103410.B (second shell from the holotype lot); UMZC I.103405 (single shell from the R. McAndrew collection labelled "*Campylaea Helferi* Bens. (Type), Bens. col., Andeman Is")
Type locality Andaman Islands: "Habitat in Insulis Andamanicis sinus Bengalensis" [lives on the Andaman Islands in the Bay of Bengal]
Remarks Benson based his original description on a single specimen but provided no details of its origin. However, he noted that it was characterized by "scattered shallow indentations, the seat of the hairs, which are to be detected on the portion of the caducous epidermis remaining in the single specimen received for examination." (Benson, 1860c, 191). This statement clearly indicates that the holotype was a weathered specimen with only fragments of surviving periostracum. Despite being labelled as the "type", UMZC I.103405 cannot therefore be the holotype and

is in fact the "perfect example" provided later by Major Haughton amongst other specimens from Port Blair, Andaman Islands (Benson, 1863b: 318). We therefore identify the larger of the two weathered specimens in UMZC I.103410, which matches Benson's original measurements, as the holotype. This species is endemic to the Andaman Islands (Rao et al., 2013).

Chloritis (*Trichochloritis*) *hemiopta* (Benson, 1863)

Helix hemiopta Benson, 1863b: 318; Hanley and Theobald, 1870 [in 1870–1876]: 15, Pl. 30, Fig. 4, Pl. 53, Fig. 8
Helix (*Planispira*) *hemiopta* Benson; Nevill, 1878: 78
Planispira hemiopta (Benson); Godwin-Austen, 1895a: 442
Chloritis (*Trichochloritis*) *hemiopta* (Benson); Pilsbry, 1894 [in 1893–1895]: 124; Gude, 1914a: 174; Richardson, 1985: 99; Ramakrishna et al., 2010: 327
Type material UMZC I.103120.A, **Fig. 97 F** (one of two syntypes from the R. McAndrew collection labelled "*Hygromia Hemiopta* Bens., Bens. col., Andeman I.")
Original measurements: "Diam. major 16, minor 13½, axis 10 mill."
Type locality Andaman Islands: "ad Portum Blair Andamanicum" [at Port Blair, Andaman Islands]
Remarks Benson based his original description on two shells: "Two dead specimens of this shell, only one of which has the aperture complete, were collected by Major J.C. Haughton." The unfigured syntype (UMZC I.103120.B) has a damaged aperture. This species is endemic to the Andaman Islands (Rao et al., 2013).

Genus *Ganesella* W.T. Blanford, 1863

Ganesella acris (Benson, 1859)

Helix acris Benson, 1859f: 387; Hanley and Theobald, 1872 [in 1870–1876]: 25, Pl. 54, Fig. 6
Helix (*Trochomorphoides*) *acris* (Benson); Nevill, 1878: 80
Helix (*Patula* (*Trochomorpha*)) *acris* Benson; Tryon, 1887: 74, Pl. 14, Fig. 1
Ganesella acris (Benson); Pilsbry, 1894 [in 1893–1895]: 170; Gude, 1914a: 194; Richardson, 1985: 129; Schileyko, 2003: 1518; Ramakrishna et al., 2010: 328
Type material NHMUK 1888.12.4.623, **Fig. 98 A** (holotype from the W. Theobald collection labelled "*Ganesella acris* Benson, Khasi Hills")
Original measurements: "Diam. major 10, minor 9, axis 9 mill."
Other material NHMUK 1888.12.4.624 (another specimen from the holotype lot)
Type locality India: "Habitat ad Teria Ghát montium Khasiae, raro" [lives at Teria Ghát, Khasia hills, rare]
Remarks Benson's original description was based on a single shell provided by William Theobald: "The single specimen examined is much weathered, so that the sculpture and colour may eventually require an amended description". NHMUK 1888.12.4.623 conforms closely to Benson's original description and measurements and we therefore consider it to be the holotype. NHMUK 1888.12.4.624 is smaller and in fresher condition. In India this species has been recorded from Arunchal Pradesh, Meghalaya, Nagaland and West Bengal (Ramakrishna et al., 2010). *Helix acris* was designated the type of the subgenus *Trochomorphoides* G. Nevill, 1878 but this genus is now regarded as a synonym of *Ganesella* W.T. Blanford, 1863.

Ganesella capitium (Benson, 1848)

Helix capitium Benson, 1848b: 160; Reeve, 1852 [in 1851–1854], 7 (*Helix*): pl. 125, species 749; Hanley and Theobald, 1870 [in 1870–1876]: 7, Pl. 14, Fig. 5
Helix (*Ganesella*) *capitium* (Benson); Blanford, 1863b: 86
Helix (*Planispira*) *capitium* (Benson); Nevill, 1878: 78
Helix (*Patula* (*Trochomorpha*)) *capitium* Benson; Tryon, 1887: 74, Pl. 14, Fig. 99
Ganesella capitium (Benson); Pilsbry, 1894 [in 1893–1895]: 170, Fig. 55, Fig. 18; Gude, 1914a: 196; Richardson, 1985: 132; Schileyko, 2003: 1518; Ramakrishna et al., 2010: 329; Sutcharit et al., 2019: 55, Fig. 2A
Type material UMZC I.102385/1 (lectotype designated by Sutcharit et al. (2019) from the R. McAndrew collection labelled "*Geotrochus Capitium* Bens., Bens. col., Cuttack, Bahar"); UMZC I.102385/2, **Fig. 98 B** (paralectotype from the same lot)
Original measurements: "Diam. major 14 mill., minor 13. Axis 11 mill. Mus. nost. et D. Boys" [my collection and Mr Boys']
Other material UMZC I.102385/3 (specimen provided by William Theobald)
Type locality India: "in palude prope Sicrigali privinciae Bahar Indiae Orientalis. D. [Dominus] Boys" [in a marsh near Sicrigali, in the province of Bahar, East India. Mr Boys]
Remarks The number of specimens provided by Captain William Boys was not noted in Benson's original description, which was based on material in the collections of both men. In a later paper he mentioned another juvenile "imperfect specimen" provided by William Theobald from "the hills above Cuttack, 400 miles to the southward of its original habitat" (Benson, 1856f: 251). UMZC I.102385/3 is clearly identifiable as that specimen and is therefore not included in the type series. The lectotype designated by Sutcharit et al. (2019) is damaged so we

have illustrated the better-preserved paralectotype. This is the type species of *Ganesella* W.T. Blanford, 1863 by subsequent designation (Pilsbry, 1895 [in 1893–1895]: 168). Budha et al. (2012) described a new genus and species of pseudsigmurethrous orthurethran pulmonate (*Darwininitium shiwalikianum* Budha & Mordan, 2012) from Nepal, which they attributed to the Cerastidae. However, the conchological similarity to *Ganesella capitium* was subsequently noted raising suspicions that these two taxa are conspecific, a suspicion now confirmed by COI and rDNA sequence data (Budha et al., 2016). This was confirmed by recent redescription of *H. capitium*, including anatomical characters, by Sutcharit et al. (2019).

Ganesella galea (Benson, 1859)

Helix galea Benson, 1859f: 388; Hanley and Theobald, 1872 [in 1870–1876]: 25, Pl. 54, Fig. 7
Nanina (*Sesara* ?) *galea* (Benson); Nevill, 1878: 53
Helix (*Patula* (*Trochomorpha*)) *galea* Benson; Tryon, 1887: 75, Pl. 14, Fig. 4
Sesara? *galea* (Benson); Blanford and Godwin-Austen, 1908: 249
Ganesella galea (Benson); Pilsbry, 1895 [in 1893–1895]: 170; Gude, 1914a: 198; Richardson, 1985: 136; Ramakrishna et al., 2010: 329 (also listed as *Sesara galea* on p. 220)
Type material NHMUK 1888.12.4.511, **Fig. 98 C** (holotype from the W. Theobald collection labelled "*Helix galea* Benson, Khasi Hills")
Original measurements: "Diam. major vix 9, minor 8, axis 5½ mill."
Type locality India: "Habitat ad Teria Ghát, raro occurrens" [lives at Teria Ghát, occurs rarely]
Remarks Benson based his original description on a single specimen provided by William Theobald: "The shell is much weathered; the sculpture is indistinct and the colour uncertain in the single specimen submitted to my examination". Gude (1914a: 198) noted that the specimen from the Theobald collection agrees well with Benson's description, except that the last whorl is shortly and abruptly deflected in front. Nevill (1878: 53) tentatively attributed this species to the genus *Sesara*, a lead followed by Blanford and Godwin-Austen (1908: 249). Gude (1914a) dismissed this attribution and followed Pilsbry (1895 [in 1893–1895]: 170) in attributing it provisionally to *Ganesella*.

Ganesella hariola (Benson, 1856)

Helix hariola Benson 1856f: 251; Theobald, 1857: 249; Pfeiffer, 1860 [in 1854–1869], 1, 134: pl. 36, figs 21–22; Hanley and Theobald, 1870 [in 1870–1876]: 7, Pl. 14, Fig. 6
Helix (*Planispira*) *capitium* var. *hariola* (Benson); Nevill, 1878: 78
Helix (*Patula* (*Trochomorpha*)) *capitium* var. *hariola* Benson; Tryon, 1887: 74, Pl. 14, Fig. 100
Helix (*Ganesella*) *hariola* Benson; Godwin-Austen, 1888a: 242
Ganesella capitium var. *hariola* (Benson); Pilsbry, 1894 [in 1893–1895]: 170; Gude, 1914a: 197
Ganesella hariola (Benson); Sutcharit et al. 2019: 55, figs 2 C–E
Type material UMZC I.104370/2, **Fig. 98 D** (paralectotype, one of four shells from the R. McAndrew collection labelled "*Geotrochus hariola* Bens, Ava", no collection data)
Original measurements: "Diam. major 15, minor 13, axis 10½ mill. Apert. 6½ mill. longa, 8 lata."
Type locality Burma: "Hab. ad Thyet Myo, prope ripas Irawadi fluvii. Detexit W. Theobald" [lives at Thyet Myo, near the banks of the Irawadi River. Discovered by W. Theobald]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. Theobald (1857: 249) later noted that this species was "rather rare" and "inhabits Acacia trees in the jungle". This form was distinguished from typical specimens of *capitium* by its more rounded periphery, but intermediate forms have been found, casting doubt on the validity of this variety as a distinct taxonomic entity (Gude, 1914a: 197). However, Sutcharit et al. (2019) maintained its distinctness from *G. capitium* Benson, 1848 on the basis of its more depressed spire and from *G. carinella* (Möllendorff, 1902) on the basis of its deeper suture and more rounded last whorl. They also designated a lectotype (UMZC I.103470/1), although the Cambridge specimens are not labelled as coming from the Benson collection.

Ganesella scenoma (Benson, 1863)

Helix scenoma Benson, 1863b: 319; Hanley and Theobald, 1872 [in 1870–1876]: 25, Pl. 53, Fig. 5
Helix (*Planispira*) *scenoma* (Benson); Nevill, 1878: 79
Ganesella scenoma (Benson); Pilsbry, 1895 [in 1893–1895]: 170; Gude, 1914a: 195; Richardson, 1985: 142
Type material UMZC I.103180, **Fig. 98 E** (holotype from the R. McAndrew collection labelled "*Hygromia Scenoma* Bens., Bens. col., Moulmein")
Original measurements: "Diam. major 16, minor 14, axis 11 mill."
Type locality Burma: "habitat prope Moulmein" [lives near Moulmein]
Remarks Benson based his original description on one shell: "A single specimen, slightly worn, of the type was received with *Helix Gordoniae*" [a reference to

material from Moulmein supplied by Mrs Gordon – see entry for *H. gordoniae*].

***Ganesella scenoma depressa* (Benson, 1863)**
comb. nov.

Helix scenoma var. *depressa* Benson, 1863b: 319; Hanley and Theobald, 1872 [in 1870–1876]: 25, pl. 53, figs 3, 4
Type material UMZC I.103185, **Fig. 98 F** (syntype from the R. McAndrew collection labelled "*Hygromia Scenoma* Var. Bens., Bens. col., Moulmein")
Original measurements: "diam. major 17, minor 15, axis 10½ mill."
Type locality Burma: "habitat prope Moulmein" [lives near Moulmein]
Remarks The number of specimens examined were not noted in Benson's original description, but there appear to have been several: "Specimens of the depressed form were collected by Col. Robert Gordon" (Benson 1863b: 319). UMZC I.103185 closely matches the given measurements in the original description.

Genus *Plectorhagada* Iredale, 1933

***Plectorhagada plectilis* (Benson, 1853)**

Helix plectilis Benson, 1853a: 29; Reeve 1853 [in 1851–1854], 7 (*Helix*): pl. 172, species 1162; Cox, 1868: 44, Pl. 9, Fig. 17
Helix (*Rhagada*) *plectilis* Benson; Tryon, 1890: 188, pl. 35, figs 16, 17, 18
Plectorhagada plectilis (Benson); Pilsbry, 1894 [in 1893–1895]: 136; Richardson, 1985: 231; Smith, 1992: 141; Schileyko, 2003: 1517
Type material UMZC I.103790.A, **Fig. 99 A** (one of four syntypes from the R. McAndrew collection labelled "*Cochlea Plectilis* Bens., Bens. col., Shark's Bay")
Original measurements: "Diam. major 15, minor 12, axis 10 mill."
Type locality Australia: "Hab. ad oras sinus "Shark's Bay" dicti Australiae Occidentalis" [lives on the shores of the gulf called "Sharks Bay", Western Australia]
Remarks The number of specimens examined was not noted in Benson's original description. This is the type of *Plectorhagada* Iredale, 1933 by original designation (Iredale, 1933: 52, 58).

Genus *Rhagada* E. von Martens, 1860

***Helix tescorum* Benson, 1853**

Tentatively accepted as *Rhagada torulus* (A. Férussac, 1819); *Helix torulus* Férussac, 1819: 34

Helix tescorum Benson, 1853a: 30; Reeve, 1853 [1851–1854], 7 (*Helix*): pl. 171, species 1154; Cox, 1868: 68, Pl. 9, Fig. 5
Helix (*Rhagada*) *tescorum* Benson; Tryon, 1890: 187, Pl. 36, Fig. 34
Rhagada tescorum (Benson); Richardson, 1985: 267
Type material UMZC I.103785, **Fig. 99 B** (holotype from the R. McAndrew collection labelled "*Helix Tescorum* Bens., Bens. col., Shark's Bay, Aust.")
Original measurements: "Diam. major 20, minor 18, axis 14 mill."
Other material NHMUK 1970018 (single shell from the H. Cuming collection labelled "Sharks Bay, N. Australia")
Type locality Australia: "Hab. cum praecedente ad sinum Shark's Bay" [lives with the preceding [*Helix plectilis*] at Shark's Bay]
Remarks Benson based his original description on one shell: "The single specimen which I have of this shell is apparently in a fossil state; and in finer condition, may exhibit more colour." Both the UMZC and NHM specimens, which both come from Shark's Bay, have been claimed to be the type (Smith, 1992: 174) but only the former is unambiguously from the Benson collection. We therefore regard this as the holotype. The real identity of *tescorum* has proved problematic and several authors (Smith, 1992: 174; Solem, 1997: 1672; Stanisic et al., 2015) have listed it as *Incertae sedis*. The specimens of *tescorum* closely resemble shells of *Rhagada torulus* (A. Férussac, 1819), the species known living from the Shark's Bay area today (Stanisic et al., 2017), except that they lack the peripheral coloured band characteristic of this species. However, the shells of *tescorum* are bleached and they might be fossils derived from the cemented limestone cliffs that occur in this region (C. Whisson, *pers. comm*.). We therefore provisionally regard *tescorum* as a synonym of *Rhagada torulus* (A. Férussac).

Genus *Trachia* E. von Martens, 1860 [65]

***Trachia contracta* (Benson, 1864)**

Helix contracta Benson, 1864a: 137; Hanley and Theobald, 1872 [in 1870–1876]: 26, pl. 55, figs 8, 9
Helix (*Planispira*) *contracta* Hutton; Nevill, 1878: 77
Helix (*Plectotropis* (*Trachia*)) *contracta* Benson; Tryon, 1888a: 65, pl. 14, figs 61, 62
Planispira (*Trachia*) *contracta* (Benson); Pilsbry, 1894 [in 1893–1895]: 116; Gude, 1914a: 157
Trachia contracta (Benson); Richardson, 1985: 297; Ramakrishna et al., 2010: 332
Type material UMZC I.102310.A, **Fig. 99 C** (one of two syntypes from the R. McAndrew collection

labelled "*Campylaea Contracta* Hutton, Bens. col., Mhow")
Original measurements: "Diam. major 13, minor 10, alt. 4 mill. Apert. lata 5½, alt. 4 mill."
Type locality India: "Habitat prope Mhow, Malwa. Detexit Capt. T. Hutton" [lives near Mhow, Malwa. Discovered by Capt. T. Hutton]
Remarks The number of specimens examined was not noted in Benson's original description: "It occupies an intermediate place between the southern *H. Nilagirica* and the Bundlkhund *H. asperella*, Pfr., first taken by me in 1824, also taken at Mhow by Capt. Hutton". Gude (1914a: 157) noted that *contracta* seemed to be rare but it has been recorded from several regions in India including Bihsar, Delhi, Orissa and Uttar Pradesh (Ramakrishna et al., 2010).

Trachia crassicostata (Benson, 1848)

Helix crassicostata Benson, 1848b: 159; Reeve, 1852 [in 1851–1854], 7 (*Helix*): pl. 125, species 747; Hanley and Theobald, 1872 [in 1870–1876]: 24, Pl. 50, Fig. 10
Helix (*Planispira*) *crassicostata* (Benson); Nevill, 1878: 77
Helix (*Plectotropis* (*Trachia*)) *ruginosa* var. *crassicostata* Benson; Tryon, 1888a: 64, Pl. 14, Fig. 67
Planispira (*Trachia*) *ruginosa* var. *crassicostata* Benson; Pilsbry, 1894[in 1893–1895]: 116
Planispira (*Trachia*) *crassicostata* (Benson); Gude, 1914a: 158
Trachia crassicostata (Benson); Ramakrishna et al., 2010: 332; Raheem et al., 2014: 110, Fig. 69E
Type material UMZC I.102380.A, **Fig. 99 D** (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 110–111, Fig. 69E) from the R. McAndrew collection labelled "Ind.")
Original measurements: "Diam. major 13 mill., minor 10. Axis 4 mill."
Other material see remarks for details of other UMZC material; NHMUK 1906.2.2.117 (three shells from the W.T. Blanford collection labelled "*Planispira crassicostata* Bs, Caroor, Salem")
Type locality India: "Hab. in dumetis Indiae meridionalis. Jerdon" [lives in the thickets of southern India. Jerdon] "Dr. Jerdon sent it to me, with *H. ruginosa*, from the jungles of Salem"
Remarks There are two lots in the UMZC: I.102375 (eight shells) labelled "*Helix crassicostata*" and UMZC I.102380.A–F (six shells) labelled "*Campylaea crassicostata* Bens." The lectotype (UMZC I.102380.A) matches Benson's description closely (major diameter a bit smaller in UMZC I.102380.A, minimum diameter as given by Benson), and Reeve's (1852) figure of a shell of *P. crassicostata* from Benson's collection (Reeve, 1852 [in 1851–1854], pl. 125, species 747). UMZC I.102380.B closely corresponds to Reeve's (1852 [in 1851–1854], pl. 125, species 748) figure of *P. ruginosa*, also from Benson's collection. One has characteristics of both *T. crassicostata* and *T. ruginosa* (UMZC I.102380.F) and the rest (UMZC I.102380.C–E) appear to belong to an entirely different species of *Trachia* (Raheem et al., 2014: 111); the same is true of the eight shells comprising UMZC I.102375. *Trachia crassicostata* is endemic to the northern Western Ghats, where it has been identified from Pune (Raheem *et al.*, 2014: 110).

Trachia fritillata (Benson, 1863)

Helix fritillata Benson, 1863b: 320; Hanley and Theobald, 1874 [in 1870–1876]: 36, pl. 86, figs 8–10
Helix (*Patula* (*Punctum*)) *fritillata* Benson; Tryon, 1887: 33, pl. 22, figs 17–19
Planispira (*Trachia*) *fritillata* (Benson); Gude, 1914a: 166
Trachia fritillata (Benson); Richardson, 1985: 298
Type material a neotype (NHMUK 1888.12.4.1085, **Fig. 99 E)** is hereby designated from the W. Theobald collection labelled "*H.* (*Macrochlamys*) *fritillata* Benson, Pegu"). We have designated a neotype with the express purpose of clarifying the taxonomic status of *T. fritillata* (see below).
Original measurements: "Diam. major 13, minor 12, axis 7 mill."
Type locality Burma: "Habitat in regione Peguensi" [Habitat: in the region of Pegu]
Remarks Benson based his original description on one shell: "A single specimen, belonging to the Museum of the Asiatic Society of Calcutta, was received for examination." We assume that Benson returned the specimen to the museum after description. However, Nevill (1878) did not include this species in his handlist of material in the Indian Museum, which included the collections of the Asiatic Society, and it appears that the holotype was lost. There is no record of who collected the specimen and, although William Theobald was working in Pegu at a time that would be consistent with his having collected it, there is no documentary evidence in support of this. Nevertheless, NHMUK 1888.12.4.1085 is probably as close as can be achieved as a representative of this species.

Trachia trochalia (Benson, 1861)

Helix trochalia Benson, 1861d: 82; Hanley and Theobald, 1870 [in 1870–1876]: 14, Pl. 28, Fig. 7
Helix (*Planispira*) *trochalia* Benson; Nevill, 1878: 77
Planispira (*Trachia*) *trochalia* (Benson); Pilsbry, 1894 [in 1893–1895]: 115–116, pl. 34, figs 4, 5; Gude, 1914a: 164

Planispira trochalia (Benson); Godwin-Austen, 1895a: 442; Rao et al., 2013: 142
Trachia trochalia (Benson); Richardson, 1985: 300; Ramakrishna et al., 2010: 335
Type material UMZC I.103340, **Fig. 99 F** (syntype from the R. McAndrew collection labelled "*Trochomorpha Trochalia* Bens., Bens. col., Andeman Ids". A later annotation in unknown handwriting attributes the genus to *Trachia*)
Original measurements: "Diam. major 22, minor 19, axis 13 mill."
Type locality Andaman Islands: "Habitat ad Portum Blair Insulae Andamanicae. Detexit Capt. J.C. Haughton" [lives at Port Blair, Andaman Islands. Discovered by Capt. J.C. Haughton]
Remarks The number of specimens provided by Captain Haughton was not noted in Benson's original description. This species is endemic to the Andaman Islands (Rao et al., 2013).

Subfamily BRADYBAENINAE [63]

Tribe BRADYBAENINI

Genus *Bradybaena* H. Beck, 1837

Bradybaena bolus (Benson, 1856)

Helix bolus Benson, 1856f: 252; Theobald, 1857: 249; Hanley and Theobald, 1872 [in 1870–1876]: 25, Pl. 53, Fig. 7
Helix (*Planispira*) *bolus* (Benson); Nevill, 1878: 80
Helix (*Dorcasia* ?) *bolus* Benson; Blanford, 1863b: 86; Tryon, 1887: Pl. 48, Fig. 77
Eulota bolus (Benson); Gude, 1914a: 199
Bradybaena bolus (Benson); Richardson, 1983: 22
Type material UMZC I.102975.A, **Fig. 100 A** (one of two syntypes from the R. McAndrew collection labelled "*Hygromia Bolus* Var. Bens., Bens. col., Prome"); UMZC I.102980 (two syntypes from the R. McAndrew collection labelled "*Hygromia Bolus* Bens., Bens. col., Burmah"); UMZC I.102985 (damaged syntype from the R. McAndrew collection apparently labelled by Benson "*Helix Bolus* B., Burmah")
Original measurements: "Diam. major 14, minor 12, axis 10½ mill. [less globose variety]; Diam. major 15½, minor 14, axis 11½ mill. [more globose variety]; Apert. majoris 9 mill. longa, 8 lata."
Other material NHMUK 1888.12.4.1125–1128 (four shells from the W. Theobald collection labelled "*H. (Fruticola*) *bolus* Benson, Pegu")
Type locality Burma: "Hab. ad Prome. Detexit W. Theobald" [lives at Prome. Discovered by W. Theobald]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description, although he clearly examined several that could be split into two un-named varieties: "This shell varies in being more or less globose in the last whorl, some specimens presenting a subturbinate appearance. The band is indifferently present or absent in each variety". Theobald (1857: 249) noted that the species was "very abundant at Thaiet-mio, Prome, Henzada, &c." and listed specimens from Prome, including the un-named depressed variety, in the Museum of the Asiatic Society (Theobald, 1860: 81). According to Tryon (1887: 209) this is a synonym of "*H. tourannensis* Souleyet, 1842" (= *Bradybaena* (*Acusta*) *tourannensis*).

Bradybaena cestus (Benson, 1836)

Helix cestus Benson, 1836a: 353; Reeve 1852 [in 1851–1854], 7 (*Helix*): pl. 125, species 751; Hanley and Theobald, 1870 [in 1870–1876]: 14, Pl. 29, Fig. 7
Helix (*Planispira*) *cestus* (Benson); Nevill, 1878: 80
Helix (*Helicella* (*Dorcasia*)) *cestus* Benson; Tryon, 1887: 206, pl. 47, figs 31, 32
Eulota cestus (Benson); Pilsbry, 1895 [in 1893–1895], 204; Gude, 1914a: 200
Bradybaena cestus (Benson); Richardson, 1983: 24; Ramakrishna et al., 2010: 336
Type material UMZC I.102000.A, **Fig. 100 B** (one of two syntypes from the R. McAndrew collection labelled "*Hygromia Cestus* Bens., Bens. col., Sylhet"); NZSI M.18987/3 (six syntypes labelled "*Trachi* [sic] *cestus* Benson, Sylhet, Assam, Type, A.S.B. [Asiatic Society of Bengal])
Original measurements: "Diam. 0.65 poll."
Type locality India/Bangladesh: part of a collection "chiefly made in the hills on the N.E. Frontier of Bengal".
Remarks The number of specimens examined was not noted in Benson's original description, which was based on material in the Museum of the Asiatic Society acquired from an expedition to "Sylhet, Cherra Poonji and the Khasi Hills" (Pearson, 1833). Nevill (1878: 80) listed six shells in the Indian Museum labelled "Sylhet (type); ex c. As. Soc., Bengal.", which are the specimens that form NZSI M.18987/3. Benson (1848a: 162) later provided an extended description defining additional characters that can be used to distinguish *H. cestus* from similar species with which it had been confused (cf. Pfeiffer, 1848: 336). In India, this species has been reported from Arunachal Pradesh and Assam; it is also known from Cambodia and Bangladesh (Ramakrishna et al., 2010).

Bradybaena peguensis (Benson, 1860)

Helix peguensis Benson, 1860c: 192; Hanley and Theobald, 1872 [in 1870–1876]: 27, Pl. 58, Fig. 6
Helix (*Dorcasia* ?) *peguensis* Benson; Blanford, 1863b: 86
Helix (*Planispira*) *peguensis* Benson; Nevill, 1878: 79
Helix (*Euhadra*) *peguensis* Benson; Tryon, 1890: 113, Pl. 31, Fig. 22
Eulota peguensis (Benson); Pilsbry, 1895 [in 1893–1895]: 204; Gude, 1914a: 205
Bradybaena peguensis (Benson); Richardson, 1983: 33
Type material a neotype (NHMUK 1906.2.2.296, **Fig. 100 C**) is hereby designated from the W.T. Blanford collection labelled "*Planispira peguensis* Bs., Shwe Gheen, Pegu"). We have designated a neotype with the express purpose of clarifying the taxonomic status of *B. peguensis* (see below).
Original measurements: "Diam. major 20, minor 18, axis 13 mill."
Other material UMZC I.104545 (four shells from the R. McAndrew collection labelled "*Nanina Peguensis* Bens., Bens. col., Ava")
[original measurements: "Diam. major 20, minor 18, axis 13 mill."]
Type locality Burma: "Habitat ad Sheoay-Gheen, Pegu. Detexit Capt. J.C. Haughton" [lives at Sheoay-Gheen, Pegu. Discovered by Capt. J.C. Haughton]
Remarks Benson based his description on several specimens, apparently collected both as live animals and dead shells by Captain Haughton. The UMZC shells from the Benson collection are not from the type locality and are therefore not considered part of the type series.

Bradybaena pilidion (Benson, 1860)

Helix pilidion Benson, 1860c: 191; Hanley and Theobald, 1872 [in 1870–1876]: 25, Pl. 53, Fig. 6
Helix (*Planispira*) *pilidion* (Benson); Nevill, 1878: 80
Helix (*Euhadra*) *pilidion* Benson; Tryon, 1890: 114, pl. 31, Fig. 20
Eulota pilidion (Benson); Pilsbry, 1895 [in 1893–1895]: 204; Gude, 1914a: 204
Bradybaena pilidion (Benson); Richardson, 1983: 33
Type material UMZC I.103095, **Fig. 100 D** (damaged syntype from the R. McAndrew collection labelled "*Hygromia* ? *Pilideon* Bens., Bens. col., Pegu" (**Fig. 100 E**))
[original measurements: "Diam. major 16, minor 13, axis 9 mill."]
Other material NHMUK 1888.12.4.1132–1134 (two shells from the W. Theobald collection labelled "*H.* (*Fruticola*) *pilidion* Benson, Pegu")
Type locality Burma: "Habitat in regione Peguensi" [lives in the Pegu region]
Remarks Neither the number of specimens examined nor the collector who provided them was recorded in Benson's brief original description. This appears to be a rare species. Gude (1914a: 205) noted that specimens labelled "*H. pilidion*" in the Theobald collection (NHMUK 1888.12.4.1132–1134) are in fact *Ganesella scenoma*.

Bradybaena radicicola (Benson, 1848)

Helix radicicola Benson, 1848b: 161; Reeve, 1852 [in 1851–1854], 7 (*Helix*): pl. 125, species 753; Hanley and Theobald, 1873 [in 1870–1876]: 28, Pl. 62, Fig. 10
Helix (*Planispira*) *radicicola* (Benson); Nevill, 1878: 78
Helix (*Helicella* (*Dorcasia*)) *radicicola* Benson; Tryon, 1887: 210, Pl. 48, Fig. 85
Eulota radicicola (Benson); Pilsbry, 1905: 205; Gude, 1914a: 205
Bradybaena radicicola (Benson); Richardson, 1983: 34
Bradybaena (*Bradybaena*) *radicicola* (Benson); Chen and Zhang, 2004: 144; Ramakrishna et al., 2010: 336
Type material UMZC I.102390.A–B, **Figs 100 F–G** (two of six syntypes from the R. McAndrew collection labelled "*Galaxias Radicicola* Bens., Bens. col.", no locality data)
Original measurements: "Diam. major 10 mill. Axis 7 mill. Mus. nost." [my collection]
Other material NHMUK 1906.2.2.110 (three shells, one worn adult and two juveniles, from the W.T. Blanford collection labelled "*radicicola* Bs., Darjiling, coll. W.T. Blanford")
Type locality India: "Hab. prope Landour et Masuri, ad montes Himalayanos Mesopotamiae Gangeticae" [lives near Landour and Mussoorie, in the Himalayan mountains between the Gangetic rivers]
Remarks Benson based his original description on several specimens "Obtained in the hollows at the roots of sycamores by Dr. J.F. Bacon and myself in a dark and precipitous ravine running down the north side of the Queinty range, behind Rockville, Landour. A few were found by Dr. Bacon on the leaves of a shrub... on the same range; and a single deserted specimen by Capt. Hutton in the deep valley behind Mussoorie". Benson (1859h) later mentioned that his best specimen, which was figured in Reeve (1852 [in 1851–1854], 7 (Helix): pl. 125, species 753), was mislaid when he described the species in 1848. Gude (1914a: 206) noted that five of the UMZC shells were immature, and the largest of them (Fig. 100 F) had a diameter of 11.5 mm and a height of 10.75 mm, which is much taller than Benson's given measurement. He therefore doubted that the type was represented amongst the Cambridge specimens. However, Benson's "axis" is likely to refer

only to the length of the columellar axis, excluding the peristome, which explains this disparity. Benson (1859h) also mentioned that William Blanford found a weathered adult shell and two juveniles at an elevation of 4000 feet in the Rungun Valley; these specimens have been located in London (NHMUK 1906.2.2.110). *Bradybaena radicicola* is distributed from NW to NE India and has been identified from Himachal Pradesh, Uttarakhand and Sikkim (Ramakrishna et al., 2010), as well as from Nepal (Budha et al., 2015) and Bhutan (Gittenberger et al., 2017a).

Bradybaena scalpturita (Benson, 1859)

Helix scalpturita Benson, 1859f: 391; Hanley and Theobald, 1872 [in 1870–1876]: 25, Pl. 53, Fig. 9
Helix (*Planispira*) *sculpturita* (Benson); Nevill, 1878: 79; Godwin-Austen, 1888a: 242
Helix (*Helicella* (*Dorcasia*)) *scalpturita* Benson; Tryon, 1887: 211, Pl. 48, Fig. 94
Eulota scalpturita Benson; Pilsbry, 1895 [in 1893–1895]: 205; Gude, 1914a: 203
Bradybaena scalpturita (Benson); Richardson, 1983: 35; Ramakrishna et al., 2010: 337
Type material UMZC I.104920.A, **Fig. 101 A** (one of two syntypes from the R. McAndrew collection labelled "*Hygromia Scalpturita* Bens., Bens. col., Ava")
Original measurements: "Diam. major 22, minor 19, axis 14 mill."
Other material UMZC I.104915 (single shell from the R. McAndrew collection labelled "*Hygromia Scalpturita* Var., E. Ind.", no collection data)
Type locality Burma: "Habitat in regno Ava, Teste Prof. Oldham" [lives in the Ava region, according to Prof. Oldham]
Remarks The number of specimens provided by Thomas Oldham was not noted in Benson's original description, but there were at least three since he provided measurements for an un-named variety ("Var. depressior [depressed variety]: Diam. major 20½, minor 18, axis 11 mill.") and mentioned another "still more depressed and smaller variety than that of which the measurement is given". UMZC I.104915 might be one of these shells but no longer has any attribution to the Benson collection, although this is likely. Benson also mentioned additional specimens from "Macao and Pulo Pinang" provided by Theodore Cantor. Theobald (1857: 248) had earlier included Benson's manuscript name in his list of Burmese species without providing a description. Blanford (1863: 86) doubted the distinctness of *sculpturita* and thought that it was likely to be just a large solid variety of *Bradybaena similaris* (A. Férussac).

Genus *Acusta* E. von Martens, 1860

Acusta ravida (Benson, 1842)

Helix ravida Benson, 1842b: 486; Reeve, 1852 [1851–1854], 7 (*Helix*): pl. 76, species 398
Nanina (*Acusta*) *ravida* (Benson); Nevill, 1878: 45
Bradybaena (*Acusta*) *ravida* (Benson); Richardson, 1983: 42
Acusta ravida (Benson); Schileyko, 2004: 1677
Type material UMZC I.104700.A, **Fig. 101 B** (one of three syntypes, two adults and an immature shell, from the R. McAndrew collection labelled "*Helix Ravida* Benson, Bens. col., Chusan"); OUMNH.ZC.MO25555 (syntype from the T. Cantor collection labelled "1. *Helix ravida*"); NHMUK 1842.9.30.49 (syntype presented by the Hon. East India Company labelled "*Helix ravida* Cantor, trees, stones &c., Chusan")
Original measurements: none given
Type locality China: Chusan
Remarks The number of specimens provided by Theodore Cantor was not noted in Benson's original description, which gives the habitat of this species as "Trees, stones, rocks, earth". This is the type species of *Acusta* E. von Martens, 1860; the name was attributed by Martens to Benson (p. xii) and Albers MS (p. 56). Wu (2004) included *A. ravida* in Camaenidae on the basis of phylogenetic analysis.

Tribe AEGISTINI

Genus *Aegista* Albers, 1850

Aegista tapeina (Benson, 1836)

Helix tapeina Benson, 1836a: 352; Benson, 1842b: 486; Reeve, 1852 [in 1851–1854], 7 (*Helix*): pl. 125, species 750, figs a, b; Blanford, 1865: 89; Hanley and Theobald, 1870 [in 1870–1876]: 8, Pl. 15, Fig. 6
Helix (*Dorcasia* ?) *tapeina* (Benson); Blanford, 1863b: 86
Helix (*Plectotropis*) *tapeina* Benson; Nevill, 1878: 74; Tryon, 1888a: 53, Pl. 12, Fig. 71
Eulota (*Plectotropis*) *tapeina* (Benson); Pilsbry, 1895 [in 1893–1895]: 209
Plectotropis tapeina (Benson); Gude, 1914a: 214; Budha et al., 2015: 29
Aegista (*Plectotropis*) *tapeina* (Benson); Richardson, 1983: 17; Ramakrishna et al., 2010: 339
Aegista tapeina (Benson); Páll-Gergely et al., 2020e: 383
Type material UMZC I.102035, **Fig. 101 C** (one of three syntypes from the R. McAndrew collection labelled "*Hygromia Tapeina* Bens., Bens. col., E. Ind."); UMZC I.105270 (syntype from the R. McAndrew collection labelled "*Hygromia Tapeina* Var., Bens. col., E. Ind."); UMZC I.105265 (syntype

from the R. McAndrew collection labelled "*Hygromia Tapeina* Var., Bens. col.", no locality data)
Original measurements: "Diam. 0.6 poll."
Other material UMZC I.105275 (single shell from the R. McAndrew collection labelled "*Hygromia Tapeina* Var. *Repanda*, Bens. col., Pegu"); NHMUK 20210289 (three shells from the H. Cuming collection labelled "*tapeina* Bens., E. Frontier of Bengal", one of which contained a scrap of paper stating "Pegu"); NHMUK 1869.6.4.27 (single shell presented by Dr T. Horsfield labelled "*tapeina* Benson, India")
Type locality India/Bangladesh: part of a collection "chiefly made in the hills on the N.E. Frontier of Bengal".
Remarks The number of specimens examined was not noted in Benson's original description, which was based on material in the Museum of the Asiatic Society acquired from an expedition to "Sylhet, Cherra Poonji and the Khasi Hills" (Pearson, 1833). Nevill (1878: 74) listed four shells in the Indian Museum labelled "Sylhet (type); ex c. As. Soc., Bengal.", which are also likely to be syntypes. This species has been recorded from India, Bangladesh, Burma and Nepal (Ramakrishna et al., 2010; Budha et al., 2015).

Aegista oldhami (Benson, 1859)

Helix oldhami Benson, 1859e: 185; Hanley and Theobald, 1870 [in 1870–1876]: 8, Pl. 15, Fig. 7
Helix (*Dorcasia* ?) *oldhami* Benson; Blanford, 1863b: 86
Helix (*Plectotropis*) *oldhami* Benson; Nevill, 1878: 73
Helix (*Plectotropis* (*Aegista*)) *oldhami* Benson; Tryon, 1888a: 61, pl. 13, Fig. 25
Eulota (*Plectotropis*) *oldhami* (Benson); Pilsbry, 1895: 209
Plectotropis oldhami (Benson); Gude, 1914a: 212
Aegista (*Plectotropis*) *oldhami* (Benson); Richardson, 1983: 14; Ramakrishna et al., 2010: 339
Aegista oldhami (Benson); Páll-Gergely et al., 2020e: 383
Type material UMZC I.104645 (three syntypes from the R. McAndrew collection labelled "*Polygyra Oldhami* Bens., Bens. col., Ava", one of which (UMZC I.104645.A, **Fig. 101 D**) is here designated as the lectotype)
Original measurements: "Diam. major 13, minor 11, axis 6 mill."
Type locality Burma: "Habitat in regno Burmano [lives in the Kingdom of Burma]; Collected by Professor Oldham, Chief of the Indian Geological Survey, during his visit to the capital of Ava"
Remarks Benson based his original description on several specimens in a "weathered and bleached condition" provided by Thomas Oldham. Theobald (1857: 248) had previously included Benson's manuscript name in his list of Burmese species without providing a description. According to Gude (1914a: 213) the three specimens recognised here as representing the type series is a mixed lot and he identified one specimen (**Fig. 101 E**) as *Plectotropis tapeina* var *akowtongensis*; this is a distinct species, currently accepted as *Plectotropis akowtongensis* (Theobald, 1859). To clarify the identity of the name bearing type of *Helix oldhami* Benson, 1859, we have therefore designated a lectotype.

Genus *Landouria* Godwin-Austen, 1918 [66]

Helix orbicula Benson, 1838

Accepted as *Landouria huttonii* (L. Pfeiffer, 1842);
Helix huttoni L. Pfeiffer, 1842 [in 1841–1846], ii: 82

Helix orbicula Benson, 1838b: 217 (non *H. orbicula* d'Orbigny, 1835)
Type material UMZC I.102085.A, **Fig. 101 D** (one of four syntypes from the R. McAndrew collection labelled "*H. Huttoni* Pfr., Bens. col.", no locality data; these are contained in a plastic bag labelled by Bishop "*Helix orbicula*")
Original measurements: "Diam. 0.4"
Type locality India: several places are mentioned - "met with under dead leaves and moss, on damp rocks and at the roots of trees at *Simla* and *Mahássú*" and another specimen from "an interesting collection made for Mr. BENSON by Dr. CHAPMAN, at the *Darjiling* Sanatarium" (Hutton and Benson, 1838: 217).
Remarks This species is often attributed to Hutton (or to Hutton & Benson) but Benson's initial (B) follows the relevant section of their joint paper (Hutton and Benson, 1838), so we consequently attribute sole authorship to Benson. The name *Helix orbicula* is preoccupied and this species has been assigned to a number of genera, such as *Eulota* (e.g. Pilsbry, 1895 [in 1893–1895], ix: 209) and *Plectotropis* (e.g. Gude, 1914a: 211) but it is now widely known as *Landouria huttonii* (L. Pfeiffer, 1842). The original locality of *L. huttonii* is also from Simla and Mahasu (=Mahássú); a lectotype of this species was designated by Raheem and Naggs (Raheem et al., 2014: 114, Fig. 72A). *Landouria huttonii* has been identified from north-eastern India, Nepal, Burma and China (Schileyko and Kuznetsov, 1998). Godwin-Austen (1918: 605) designated *huttoni* as the type of *Landouria*.

INCERTAE SEDIS

Family Unknown

Spiraxis cingalensis Benson, 1863

Spiraxis cingalensis Benson, 1863a: 91; Pfeiffer, 1868 [in 1847–1877]: 191; Hanley and Theobald, 1873 [in 1870–1876]: 34, Pl. 79, Fig. 1
Digoniaxis cingalensis (Benson); Jousseaume, 1894: 291; Pilsbry, 1906 [in 1906–1907], Pl. 4, Fig. 18; Pilsbry, 1908 [in 1907–1908]: 289; Gude, 1914a: 444
Type material not located
Original measurements: "Long. 14, diam. 3 mill.; apert. long. 3, diam. 1½ mill."
Type locality Sri Lanka: "Habitat ad Weelgamoowe, Matelle, Ceylon" [lives at Weelgamoowe, Matelle, Sri Lanka]
Remarks Benson's original description was based on a single dead, damaged shell "deficient in the superior whorls" in the collection of Frederick Layard. On the basis of the figure published by Hanley and Theobald (1873), Jousseaume (1894: 291) included *S. cingalensis* within his genus *Digoniaxis* because of its similarity to *D. bourguignati* Jousseaume, 1889, the type species. The latter, which had been found on a beach near Aden, Yemen, was subsequently found to be a marine pyramidellid and not a terrestrial snail belonging to Ferussaciidae as previously supposed (Neubert, 1998a). Attribution of *S. cingalensis* to Pyramidellidae was also considered unlikely since it has a truncated columella, which is not usual in that family. Moreover, *S. cingalensis* does not appear to be a subulinid because it posseses two columella lamellae (Neubert, 1998a). Benson's holotype cannot be traced and the taxonomic status of *Spiraxis cingalensis* remains a mystery. We treat it here as a *nomen dubium*.

CLASS BIVALVIA

Superfamily MYTILOIDEA

Family MYTILIDAE

Subfamily MYTILINAE

Genus *Mytilus* Linnaeus, 1758

Mytilus niger Benson, 1842 non Gmelin, 1791

Mytilus niger Benson, 1842b: 489
Type material not located
Original measurements "Long. 3.4 poll., lat. 1.7"
Type locality China: Chusan. "said to inhabit canals"
Remarks The identity of this species is unclear and the name is preoccupied by *Mytilus niger* Gmelin, 1791, now *Brachidontes niger* (Gmelin, 1791). Benson (1855a: 134) noted that the bryozoan *Flustra* occurred on the shells of many specimens, indicating that they originated in an outer-estuarine or marine habitat. We have been unable to locate any type material and here treat this taxon as a *nomen dubium*.

Subfamily MYTILISEPTINAE [67]

Genus *Mytilisepta* Habe, 1951

Dreissena purpurascens Benson, 1842

Accepted as *Mytilisepta virgata* (Weigmann, 1837); *Tichogonia virgata* Weigmann, 1837: 49

Dreissena purpurascens Benson, 1842b: 489; 1855a: 134
Type material not located
Original measurements: "Long. 1.5, Lat. 0.8 poll."
Type locality China: Chusan: "said to inhabit canals"
Remarks The number of specimens provided by Theodore Cantor was not noted in Benson's original description, although he later mentioned that Cantor never found living specimens, the type series consisting of dead shells found "about the houses of Tinghae" (Benson, 1855a: 134). This species inhabits rocks in the intertidal zone and occurs in the South and East China Seas, Hong Kong, Taiwan, and Japan.

Genus *Arcuatula* Jousseaume in Lamy, 1919

Arcuatula senhousia (Benson, 1842)

Modiola senhousia Benson, 1842b: 489; 1855a: 135
Modiola senhausii Reeve; Reeve 1857 [in 1856–1858], 10 (*Modiola*): pl. 5, species 22
Musculus (*Musculista*) *senhousia* (Benson); Yamamoto and Habe, 1958
Musculista senhousia (Benson); Willan, 1985
Arcuatula senhousia (Benson): Huber, 2010: 112
Type material OUMNH.ZC.MO25568, **Fig. 102 A** (syntype [pair of disunited valves] from the T. Cantor collection labelled "14. *Modiola senhousia*"). NHMUK 1842.9.30.3–9 (seven syntypes [two united specimens, four pairs of disunited valves and one isolated valve] presented by the Hon. East India Company labelled "*Modiola Senhousia* Cantor, coasts of Chusan"); NHMUK 1907.10.28.30–31 (two syntypes [two pairs of disunited valves] from the S. Hanley collection labelled "*Modiola senhousia* Benson, Marked TYPE in the Hanley Coll., Chusan, H. Harvey Esq.")
Original measurements: "Long. 1.2, Lat. 0.6 poll."
Other material NHMUK 1985011/1, **Fig. 102 B** (single specimen [pair of disunited valves] from the Cuming collection labelled "*Modiola senhausii* Reeve, 1857, *Conch. Icon.* 10. *Modiola*, Pl. 5, Fig. 22, Chusan"); NHMUK 1985011/2–3 (two specimens [two pairs of disarticulated valves] from the same lot).
Type locality China: "Coasts of Chusan and Canton Province"

Remarks The number of specimens provided by Theodore Cantor was not noted in Benson's original description. It seems likely that the original series was based on dead shells that had been consumed by locals, although Cantor did find "two specimens on the mud among the fragments of rocks which line the coast of Chusan" (Benson, 1855: 135). Yamamoto and Habe (1958) designated *senhousia* as the type species of their subgenus *Musculista*, which Willan (1985) subsequently elevated to full generic rank. This east Asian species has now invaded several countries, where it can dominate benthic marine habitats and exclude native species. It has been reported from California (Crooks, 1996), New Zealand (Willan, 1985; Creese et al., 1997), Australia (Slack-Smith and Brearley, 1987), the western Mediterranean (Hoenselaar and Hoenselaar, 1989) and has recently been recorded on the south coast of England (Barfield et al., 2018).

Arcuatula variegata (Benson, 1855)

Modiola variegata Benson, 1855a: 135
Arcuatula variegata (Benson); Huber, 2010: 112
Type material UMZC I.105060.A–B, **Figs 102 B–C** (two of eight syntypes [seven articulated shells and one isolated valve] from the R. McAndrew collection labelled "*Crenella* (*Modiolaria*) *Variegata* Bens?, Bens. col., Sunderbunds")
Original measurements: none given
Type locality India: Creeks of the Sunderbuns [Sundarbans]
Remarks The name *variegata* was introduced by Benson in his expanded account of the shells from Chusan, in which he wrote that a form nearly allied to "*Modiola senhousia*", but much smaller, occurs "in the Creeks of the Sunderbuns, which I propose to describe as *M. variegata*" (Benson, 1855a: 135). The Sundarbans mangrove forest, one of the largest such forests in the world, lies on the delta of the Ganges, Brahmaputra and Meghna rivers in the Bay of Bengal. Huber (2010: 112) illustrated a specimen of this species, noting that it is about 20 mm in size and lives in subtidal habitats ranging from Yemen to India.

Superfamily ARCOIDEA

Family ARCIDAE

Subfamily ANADARINAE

Genus *Scaphula* Benson, 1834

Scaphula celox Benson, 1836

Scaphula celox Benson, 1836b: 750; 1856j: 129; Blanford, 1868: 71–72, pl. III [XIV], figs 14–15; Hanley and Theobald, 1874 [in 1870–1876]: 47, pl. 116, figs 8, 9; Preston, 1915: 129; Subba Rao, 1989: 160; Ramakrishna and Dey, 2007: 268, Fig. 197
Type material UMZC I.102245, **Fig. 103 A** (syntype [single valve] with circular label in Benson's handwriting (**Fig. 103 B**) that reads: "*Scaphula Celox* Bens., R. Cane, Bundelkhand"; another label in Martin Bishop's handwriting indicates that this specimen was figured in *Conchologia Indica* pl. 116, figs 8, 9); UMZC I.102240.A, (four syntypes from the R. McAndrew collection labelled "*Scaphula Celox* Bens., Bens. col., Jumna R.")
Original measurements "Long. 12, alt. 5, crass. 8 mill." [Benson, 1856j]
Type locality India: "… first discovered in Jumna, and subsequently met with in the river Cane [at Banda; see Benson, 1856j: 127]"
Remarks Benson first collected this species in 1825 "in the rejectamenta of the River Jumna in Bundelkhund" and figured it as an un-named "fluviatile *Arca*" in one of his earliest papers (Benson, 1829d; see Table 1). It was included amongst the specimens that he presented to the Zoological Society while on furlough in England in 1834 (Benson, 1856j: 127). He did not provide a formal description until 1836, after encountering additional specimens "from the Eastern frontier" during his examination of material procured by the Asiatic Society (Benson, 1836b: 750), later clarifying that these shells had come from "the vicinity of the Khassya Hills to the east of Bengal" (Benson, 1856j: 127). He later provided an amended description complete with measurements, giving the locality as "the Jumna and Cane rivers, and in some Bengali rivers this side of the Ganges" (Benson, 1856j: 129). According to Subba Rao (1989: 160) the types were said to be in the NHM, but no specimens could be located there. Two specimens in the MCZH are labelled as "co-types" (lot MCZH 152859), but these originated from William Theobald (see Benson, 1856j) and are not part of the type series. This is the type species of *Scaphula* Benson, 1834 by subsequent monotypy (Benson, 1836b: 750). This species has been identified only from the Jumna (=Yamuna) river and its tributary, the Cane (=Ken) River near Banda in the Ganges drainage.

Scaphula pinna Benson, 1856

Scaphula pinna Benson, 1856j: 128; Blanford, 1868: 71–72, pl. III [XIV], figs 11–13; Hanley and Theobald, 1874 [in 1870–1876]: 47, pl. 116, figs 5–6; Preston, 1915: 130
Type material UMZC I.102955.A, **Fig. 103 C** (one of two syntypes [the unfigured one still articulated] with a circular label in Benson's handwriting (**Fig. 103 D**)

that reads "*Scaphula Pinna* Bens., Tenasserim River"; another label, probably written by Hanley, reads "figured in *Conch. Indica*"); UMZC I.102950 (three syntypes [one articulated specimen and two disarticulated valves] from the R. McAndrew collection labelled "*Scaphula Pinna* Bens., Bens. col., Tenasserim")
Original measurements: "Long. 11, alt. 5, crass. 6 mill."
Type locality Burma: "Habitat in flumine Tenasserim" [lives in the Tenasserim river]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description, but he mentioned that it had been "found in some abundance" (Benson, 1856j: 127). In Burma this species has been identified only from the type locality but in Thailand it occurs in the reservoir of Uthong, in the Klong Rapipat in Ayutthaya Province, and in the Palace Garden of Bang Pa-In (Brandt, 1974).

Family NOETIIDAE

Genus *Estellacar* Iredale, 1939

***Estellacar galactodes* (Benson, 1842)**

Arca galactodes Benson, 1842b: 489; 1855a: 139
Estellacar galactodes (Benson); Bernard et al., 1993: 27
Type material UMZC I.105200 (two syntypes [one articulated specimen, **Fig. 103 E**, and one isolated valve, **Fig. 103 F**] from the R. McAndrew collection labelled "*Arca Galactodes* Bens., Bens. col., Chusan")
Original measurements: "Lat. 0.75, long. 0.5 poll."
Type locality China: Chusan: "said to inhabit canals"
Remarks The number of specimens provided by Theodore Cantor was not noted in Benson's original description, although he later noted that only dead shells were collected (Benson, 1855a: 139). Oliver (1986) has published details of the life habits of this species in Hong Kong.

Superfamily UNIONOIDEA

Family UNIONIDAE [68]

Subfamily ANODONTINAE

Tribe CRISTARIINI

Genus *Sinanodonta* Modell, 1945

***Anodon gibbum* Benson, 1842**

Accepted as *Sinanodonta woodiana* (Lea, 1834);
Symphynota woodiana Lea, 1834: 42, Pl. 5, Fig. 13

Anodon gibbum Benson, 1842b: 489; 1855: 135; Reeve, 1867 [in 1866–1870], 17 (*Anodon*): pl. 6, species 15
Sinanodonta cf. *gibba* (Benson in Cantor, 1842); Kondakov et al., 2018: 513
Type material NHMUK 1842.9.30.45–46, **Fig. 104 A** (one of two syntypes presented by the Hon. East India Company labelled "*Anodon gibbum* Cantor, canals, Island of Chusan")
Original measurements: "Long. 2.0, lat. 3.2 poll."
Other material UMZC I.104025 (three articulated shells from the R. McAndrew collection labelled "*Anodonta Gibba* Bens., Shanghai"); UMZC I.104030 (two articulated shells from the R. McAndrew collection labelled *Anodonta Gibba* Var. Bens., Shanghai")
Type locality China: Chusan. "Habitat. Canals"
Remarks The number of specimens provided by Cantor was not noted in Benson's original description, but there were clearly several since he later described it as "Very common in mud in the canals" (Benson, 1855a: 136). The specimens in the UMZC from Shanghai cannot be considered part of the type series since they do not come from the type locality. Johnson (1956: 116) mentioned three "cotypes" [i.e. syntypes] in the MCZH (MCZ 177314) "from W.H. Benson ex C.B. Adams coll.n". *Anodon gibbum* has been regarded as a junior synonym of *Sinanodonta woodiana* (Lea, 1834). However, recent molecular phylogenetic work (e.g. Bolotov et al., 2016; Kondakov et al., 2018) has revealed *S. woodiana* to be a species complex consisting of several separate clades. Benson's name *gibba* has been applied to one of these clades that was thought to be native to the Yangtze River system and adjacent islands in the East China Sea (including Zhoushan Island). According to Kondakov et al. (2018) this clade is the form that has invaded Europe, Central Asia, East Siberia, Burma and probably Turkey.

Subfamily GONIDEINAE

Tribe LAMPROTULINI

Genus *Lamprotula* Simpson, 1900

***Lamprotula divergens* (Benson, 1842)**

Unio (*Theliderma*) *divergens* Benson 1842b: 489; 1855: 137
Lamprotula divergens (Benson); Graf and Cummings, 2007: 310; He and Zhuang, 2013: 61
Type material not located
Original measurements: "Long. 2.65, Lat. 3.5 poll."
Type locality China: Chusan
Remarks The number of specimens provided by Theodore Cantor was not mentioned in Benson's original description. This species has an Indotropical range occurring in the Yangtze-Huang catchment (Graf and Cummings, 2007).

Subfamily PARREYSIINAE [69]

Tribe LAMELLIDENTINI

Genus *Lamellidens* Simpson, 1900

***Lamellidens jenkinsianus* (Benson, 1862)**

Unio Jenkinsianus Benson, 1862b: 185; Hanley and Theobald, 1872 [in 1870–1876]: 19, Pl. 41 Fig. 4
Lamellidens (*Lamellidens*) *jenkinsianus* (Benson); Simpson, 1900: 857; 1914: 1176
Lamellidens (*Lamellidens*) *marginalis* var. *jenkinsianus* (Benson); Preston, 1912: 305
Lamellidens (*Lamellidens*) *marginalis jenkinsianus* (Benson); Preston, 1915: 184
Lamellidens jenkinsianus (Benson); Subba Rao, 1989: 166; Nesemann et al., 2003: 16; Ramakrishna and Dey, 2007: 285, Fig. 208; Graf and Cummings, 2007: 310 (for a full taxonomic history see Graf and Cummings, 2013); Bolotov et al., 2022: 6
Type material UMZC I.103130, **Fig. 105 A** (disarticulated syntype from the R. McAndrew collection labelled "*Unio Jenkinsonianus* [sic] Bens. (type), Bens. col., Assam". On the interior of one valve is written in pencil the name of the species and "R. Berhampooter" and on the other valve is written "Assam")
Original measurements: "Long. 51, lat. 94, diam. 38 mill."
Type locality India: "Habitat in fluvio Assamensi Berhampooter dicto" [lives in the river known as Berhampooter, Assam]
Remarks The number of specimens provided by Colonel Jenkins was not clearly noted in Benson's original description, although the wording suggests that there was only one. Hanley and Theobald (1872 [in 1870–1876]: 19) thought that there was only a single type specimen: "The unique type here figured will probably be considered an abnormal form of *marginalis* or *Corrianus*". It is unclear how they reached this conclusion, although they may have had additional information from Benson's manuscript notebooks, now lost. According to Ramakrishna and Dey (2007: 286) type material exists at the NHM but we have been unable to find this. Other specimens from Sylhet and Bhagalpur are present in the Indian Museum (Preston, 1915: 185). This species has recently been recorded from Bhutan (Gittenberger et al., 2017a).

***Lamellidens theca* (Benson, 1835)**

Accepted as *Lamellidens corrianus* (Lea, 1834);
Unio corrianus Lea, 1834: 65, Pl. 9 Fig. 25

Unio theca Benson, 1835a: 453; Benson, 1862b: 186; Hanley and Theobald, 1870 [in 1870–1876]: 6, Pl. 12, Fig. 5
Trapezoideus theca (Benson); Simpson, 1900: 859; Preston, 1915: 195
?*Trapezoideus theca* (Benson); Graf and Cummings, 2007: 312
Lamellidens theca (Benson); Konopleva et al., 2019: 10
Type material UMZC I.103220, **Fig. 105 B** (holotype [disarticulated pair of valves] from the R. McAndrew collection labelled "*Unio Theca* Bens. (unique), Bens. col., Ind." The word "Type" has been added later. On the inside of one of the valves are the words "unique *Unio theca*", but these are now very faint; writing on the other valve is illegible)
Original measurements: "Long. 20, lat. 40, diam. 10 mill."
Type locality India: "the river Cane in Bundelkhand" (Benson 1835a: 453); "Habitat in fluvio Cane, prope Banda, Bundelkhund" [lives in the river Cane, near Banda, Bundelkhund] (Benson 1862b, 186)
Remarks Benson introduced this name in 1835 in remarks concerning another Indian species, *Symphynota bilineata* Lea, 1831: "Mr Lea has named this shell from a character which exists only in young specimens, and which is also observable in a distinct and interesting species (*U. theca*, Mihi), of which I possess an unique example from the river Cane in Bundelkhand". He did not publish a detailed description of the species until nearly 30 years later, and additional specimens were not forthcoming during that time, since he later wrote "it has not appeared in any other collection made in the Gangetic region" (Benson 1862b: 186). He also noted that *theca* belonged to "the *Corrianus* type of *Unio marginalis*" and is "remarkable for its elongate-ovate non-rhomboidal form" (Benson, 1862: 187). Theobald (1876a: 47) made similar observations, stating that *theca* was a "very marked form" within his '*Marginalis* Group' of unionids, of which he had "a large odd valve of what I take to be this race from the Kistna R.". However, there is no record of the name amongst Theobald's bivalve collection in the NHM, nor amongst the J.E. Linter collection in the RAMM. Konopleva et al. (2019) established that *Trapezoideus* Simpson, 1900 is a monotypic genus, and transferred *theca* into *Lamellidens* Simpson, 1900, although the fact that the species is known only from Benson's holotype casts some doubt on its validity. Bolotov et al. (2022) have subsequently synonymised *Lamellidens theca* with *L. corrianus* (Lea, 1834).

Tribe INDOCHINELLINI [69]

Genus *Indochinella* Bolotov, Pfeiffer, Vikhrev & Konopleva, 2018 [69]

Indochinella pugio pugio (Benson, 1862)

Unio pugio Benson, 1862b: 193; Sowerby, 1868 [in Reeve, 1864–1868], 16 (*Unio*): pl. 95, species 516; Hanley and Theobald, 1870 [in 1870–1876]: 5, Pl. 10, Fig. 7
Nodularia (*Nodularia*) *pugio* (Benson); Simpson, 1900: 814; Preston, 1915: 141
Oxynaia pugio (Benson); Prashad, 1922b: 96; Subba Rao, 1989: 170; Graf and Cummings, 2007: 310
Indochinella pugio (Benson); Bolotov et al., 2018a: 7
Material UMZC I.105040.A, **Fig. 105 C** (one of two specimens from the R. McAndrew collection labelled "*Unio Pugio* Vars. Bens.", no locality or collection data); NHMUK 1870.10.17.1 (disarticulated specimen presented by R. McAndrew labelled "*pugio* Benson, Pegu, R. McAndrew Esq."); NHMUK 1888.12.4.736–738 (three disarticulated specimens from the W. Theobald collection labelled "*Unio pugio* Benson (typical), Pegu"); NHMUK 1907.10.28.258 (single specimen from the H. Harvey collection labelled "*Unio pugio* Benson, Fig. in *Conch. Indica* pl. X f. 7, from Hanley coll., Ava; Pegu"); NHMUK 20190444 (three disarticulated specimens presented by Miss J.E. Linter labelled "*Unio pugio* Bens., Pegu, pres. 1892"); MCZH 175560 (three specimens labelled "*Unio pugio* Benson, Ava Region, Burma, ex Theobald, type lot")
Original measurements: "Long. 21, lat. 42, diam. 16 mill."
Type locality Burma: "Habitat in regione Ava" [lives in the Ava region]
Remarks Benson based his description on one specimen: "The single right valve sent for examination by Mr. Theobald is decorticate and worn". Both of the UMZC specimens from the Benson collection are complete and therefore cannot be the holotype; similarly, all of the specimens in the NHM originating from the McAndrew, Theobald and Linter collections are complete and are labelled as coming from Pegu rather than Ava. Johnson (1956: 131) mentioned three specimens in the MCZH (MCZ 175560) presented by Theobald and labelled "paratypes". This species had been included in *Oxynaia*, which was known from two geographically disjunct regions of Southeast Asia: an eastern group centred on northern Vietnam typified by the type species *O. jourdyi* (Morlet, 1886) and its allies, and a western group consisting only of *O. pugio*, centred on the Irrawaddy, Sittaung and Tavoy drainage basins in Burma. This pattern of occurrence led to suspicions that *Oxynaia* F. Haas, 1913 might not be monophyletic, a conclusion recently confirmed by Bolotov et al. (2018). They concluded from molecular phylogenetic and other data that *Oxynaia* is a junior synonym of *Nodularia* Conrad, 1853 to which *jourdyi* and its allies were transferred. They also designated *pugio* as the type species of a new genus *Indochinella* Bolotov, Pfeiffer, Vikhrev & Konopleva, 2018, which they included in a new tribe, Indochinellini, within Parreysiinae (Bolotov et al., 2018a). Bolotov et al. (2019) revised *Indochinella pugio* with a description of three new Burmese subspecies: *I. pugio viridissima* from the Sittaung, Bilin and Bago rivers, *I. pugio daweiensis* from the Dawei River, and *I. pugio paradoxa* from the Haungthayaw River.

Genus *Indonaia* Prashad, 1918

Unio leioma Benson, 1862

Accepted as *Indonaia bonneaudii* (Eydoux, 1838); *Unio bonneaudii* Eydoux, 1838: 190, pl. 60, figs 1–1a

Unio Leioma Benson, 1862b: 192; Hanley and Theobald, 1870 [in 1870–1876]: 6, Pl. 12, Fig. 6. For a full taxonomic history see Graf and Cummings (2013)
Type material UMZC I.103345, **Fig. 106 A** (syntype [disarticulated shell] from the R. McAndrew collection labelled "*Unio Leioma* Bens = *Kerandrewi*? Bens. col., Dekkan"); NHMUK 1907.12.30.66 (single disarticulated shell from the H. Harvey collection labelled "*Unio leioma* Bens, from type, fig[d] in *Conch. Ind*. Pl. XII, f. 6a, from Hanley Col., near Bombay")
Original measurements: 'Long. 23, lat. 50, diam. 17 mill."
Type locality India: "Habitat in regione Dekhan? prope Bombay" [lives in the Dekhan? region, near Bombay]
Remarks The number of specimens examined was not noted in Benson's original description; he was unsure of the provenance of the shell but thought it likely to have originated from Thomas Jerdon. The specimen from the Hanley collection appears to have originated from the Benson collection ("from type") and we have therefore recognised it as a syntype. This species was previously regarded as a synonym of *Radiatula caerulea* (Lea, 1831) but has recently been synonymised with *Indonaia bonneaudii* (Eydoux, 1838) (Bolotov et al., 2022: 5).

Unio macilentus Benson, 1862

Accepted as *Indonaia gratiosa* (Philippi, 1843); *Unio gratiosus* Philippi, 1843 [in 1842–1850]: 20, Pl. 1, Fig. 5

Unio macilentus Benson, 1862b: 187; Hanley and Theobald, 1870 [in 1870–1876]: 5, Pl. 10, Fig. 2; 1876 [in 1870–1876]: 62, Pl. 154, Fig. 5 [var.]; for a full taxonomic history see Graf and Cummings (2013).
Type material UMZC I.103385, **Fig. 106 C** (syntype from the R. McAndrew collection labelled "*Unio*

Macilentus Bens., Bens. col., Rohulkhund [Rohilkhand]")
Original measurements: "Long. 24, lat. 42, diam. 15 mill."
Other material NHMUK 1906.1.1.622 [re-registered in error as 1968637] (single shell from the W.T. Blanford collection labelled "*Unio macilentus*, figd in *C.I.* Pl. CLIV, f. 5" [this figure is of an un-named variety and does not correspond with this specimen])
Type locality India: "Habitat in rivulo Choia Nuddy dicto, non procul a Bijnore, provinciae Rohilkhund" [lives river known as Choia Nuddy, not far from Bijnore, Rohilkhund province]
Remarks Benson described one specimen from the type locality: "I took a single specimen of the shell in a hurried search at the locality indicated". However, he also mentioned a second "delicate specimen which I got in the Gungun River, near Moradabad", which he considered to be a "younger variety" (Benson, 1862b: 188). Hanley and Theobald (1870 [in 1870–1876]: 5) mentioned only one specimen: "The somewhat worn condition of the type (figure 2) prevented Lea from identifying the species." Simpson (1900: 813) regarded *Unio macilentus* as a synonym of *Radiatula occata* (Lea, 1860), which has in turn been synonymised with *Indonaia gratiosa* (Philippi, 1843) by Bolotov et al. (2022: 5).

Unio pachysoma Benson, 1862

Accepted as *Indonaia caerulea* (Lea, 1831); *Unio caeruleus* Lea, 1831: 95, Pl. 13, Fig. 25

Unio pachysoma Benson, 1862b: 186; Hanley and Theobald, 1870 [in 1870–1876]: 6, Pl. 12, Fig. 1
Nodularia (*Nodularia*) *pachysoma* (Benson); Simpson, 1900: 813; Preston, 1915: 139
Indonaia pachysoma (Benson); Prashad, 1922b: 95
Parreysia (*Radiatula*) *pachysoma* (Benson); Subba Rao, 1989: 192; Graf and Cummings, 2007: 311; Ramakrishna and Dey, 2007: 325, Fig. 247; for a full taxonomic history see Graf and Cummings, 2013
Type material UMZC I.103205.A, **Fig. 107 A** (one of two syntypes from the R. McAndrew collection labelled "*Unio Pachysoma* Bens., Bens. col. Assam"); NHMUK 20150103, **Fig. 107 B** (disarticulated syntype from the S. Hanley collection (ex Leeds Museum) labelled "*pachysoma* Benson, from type, Assam")
Original measurements: "Long. 23, lat. 44, diam. 21 mill."
Other material NHMUK 1888.12.4.1708–1709 (two specimens from the W. Theobald collection labelled "*Unio pachysoma*, Benson, Calcutta")
Type locality India: "Habitat in fluvio Berhampooter Assamensi" [lives in the Brahmaputra River, Assam]"
Remarks The number of specimens provided by Colonel Jenkins was not explicitly stated in Benson's original description, but he alluded to intraspecific variation ("The inner lamina of the latter in the left valve [is] sometimes obsolete"), suggesting that several were examined. However, he also stated that he was "indebted for the type to Colonel Jenkins", rendering the situation rather ambiguous. Benson also briefly described an un-named variety of this species from Calcutta, collected by William Theobald; NHMUK 1888.12.4.1708–1709 are candidates to be these specimens. A single articulated specimen from Calcutta in the Benson collection (UMZC I.103200) also matches the description of the variety. Hanley and Theobald (1870 [in 1870–1876]: 6) dismissed this taxon as "merely a *caeruleus*." Bolotov et al. (2022: 5) have synonymised *Unio pachysoma* with *Indonaia caerulea* (Lea, 1831).

Genus *Radiatula* Simpson, 1900

Radiatula crispisulcata (Benson, 1862)

Unio crispisulcatus Benson, 1862b: 193, 195; Sowerby, 1866 [in Reeve 1864–1868], 16 (*Unio*): pl. 49, species 262; Hanley and Theobald, 1870 [in 1870–1876]: 6, Pl. 11, Fig. 5 (figured specimen not a type; see remarks)
Nodularia (*Radiatula*) *crispisulcata* (Benson); Simpson, 1900: 820; Preston, 1915: 146
Indonaia crispisulcata (Benson); Prashad, 1922b: 95
Parreysia (*Radiatula*) *crispisulcata* (Benson); Haas, 1969; Subba Rao, 1989: 189; Graf and Cummings, 2007: 311; for a full taxonomic history see Graf and Cummings (2013)
Radiatula crispisulcata (Benson); Bolotov et al., 2017: 10; 2022: 4
Type material UMZC I.103215.A, **Fig. 106 B** (one of three syntypes [two articulated specimens and an isolated valve] from the R. McAndrew collection labelled "*Unio Crisposulcatus* Bens., Bens. col., Burmah")
Original measurements: "Long. 28, lat. 45, diam. 16 mill."
Other material UMZC I.103210 (articulated specimen from the R. McAndrew collection labelled "*Unio Crispisulcatus* Benson, Pegu"); NHMUK 1907.10.28.213 (single disarticulated specimen from the H. Harvey collection labelled "*Unio crispisulcatus* Benson, shell fig[d] in *Conch. Ind.* pl. XI, f. 5, from Hanley Coll., Pegu"); NHMUK 1906.1.1.556 (single articulated specimen from the W.T. Blanford coll. labelled "Bangong R. nr. Thyet Myo, Pegu, No. 21"); LEED.C. 1957.173.26474 (single disarticulated specimen from the S.C.T. Hanley collection labelled "E. Indies, from Theobald").
Type locality Burma: "Habitat in rivulo Bangong, prope Thyet-Myo, regionis Burmanicae. Collegit W.

Theobald" [lives in the Bangong river, near Thyet-Myo, in the region of Burma. Collected by W. Theobald]

Remarks The number of specimens provided by William Theobald was not noted in Benson's original description. UMZC I.103210 is not labelled as coming from the Benson collection, although this is likely. This species was not amongst the Theobald material acquired by the BM(NH) in 1888; Godwin-Austen noted that the W.T. Blanford collection contained specimens sourced from contemporary collectors, and the precise locality data accompanying NHMUK 1906.1.1.556 suggests that this specimen might have originated from Theobald. Johnson (1971) listed a further BM(NH) specimen (NHMUK 1964358) as a probable type, although his reasons for doing so are unclear. This specimen was figured in *Conchologia Iconica* but is part of a lot of four shells in the Cuming collection from Pegu and has no documented connection with either Theobald or Benson. There is also a lot consisting of 11 shells in the MCZH (MCZ 175557) labelled "co-types" originating from Theobald, but again there is nothing linking these specimens to Benson. *Unio crispisulcatus* is the type species of *Radiatula* Simpson, 1900.

Tribe PARREYSIINI

Genus *Parreysia* Conrad, 1853

Unio laevirostris Benson, 1862

Accepted as *Parreysia corrugata* (O.F. Müller, 1774); *Mya corrugata* Müller, 1774: 214

Unio laevirostris Benson, 1862b: 191

Parreysia (*Parreysia*) *corrugata* var. *laevirostris* (Benson); Preston, 1915: 156; Subba Rao, 1989: 179; Ramakrishna and Dey, 2007: 297, Fig. 218; for a full taxonomic history see Graf and Cummings (2013)

Type material UMZC I.103235, **Fig. 107 C** (one of two disarticulated syntypes from the R. McAndrew collection labelled "*Unio Laevirostris* Bens. *Corrugatus* Var., Bens. col.", no locality data. A pencil addition to McAndrew's label reads "Type (larger shell)")

Original measurements: "Long. 28, lat. 50, diam. 20 mill."

Type locality India: "Habitat in rivulis et stagnis prope Chunár" [Habitat: in streams and ponds near Chunár]

Remarks More than one specimen form the type series: "This species was found by Capt. T. Hutton in tanks and streams near the Fort of Chunár ...". According to Subba Rao (1989: 179), the types are in the NHM but no specimens labelled as such could be located. *Unio laevirostris* was until recently widely regarded as a form of *Parreysia corrugata* (O.F. Müller) but has now been fully synonymised with that species (Bolotov et al., 2022: 6).

Unio favidens Benson, 1862 [70]

Accepted as *Parreysia corrugata* (O.F. Müller, 1774); *Mya corrugata* Müller, 1774: 214

Unio Species B (Benson, 1829: 265, Pl. 7, Fig. 1)

Unio favidens Benson, 1862b: 188; Reeve, 1868 [in 1864–1868], 16 (Unio): pl. 90, species 488; Hanley and Theobald, 1870 [in 1870–1876]: 6, Pl. 11, Fig. 1

Parreysia (*Parreysia*) *favidens* (Benson); Simpson, 1900: 842; Preston, 1915: 158; Graf and Cummings, 2007: 310; for a full taxonomic history see Graf and Cummings, 2013

Type material UMZC I.103450, **Fig. 108 A** (holotype from the R. McAndrew collection labelled "Bithoura, R. Ganges, typical". A pencil inscription inside the right valve reads "*Unio favidens* 30/5/24." In the left valve it reads "Bhitoura R. Ganges 1824". An accompanying label, apparently in Benson's handwriting (**Fig. 108 B**), reads "Ganges Bithoura 30th May 1824 Journal 54 b[?]")

Original measurements: "Long. 45, lat. 66, diam. 30 mill."

Other material NHMUK 1965215, **Figs 108 D–E** (two shells from the H. Cuming collection labelled "Assam, ex Benson"). Additional material (paired valves) in the UMZC is labelled by McAndrew "*Unio Favidens* Var Bens., Bens. col., Ind.": UMZC I.103485 (single disarticulated specimen from the McAndrew collection labelled "*Unio Favidens* Var Bens., Bens. col., Ind." with "Nujeebabad" written on the interior of one valve) UMZC I.103470 (single disarticulated specimen from the McAndrew collection labelled "*Unio Favidens* Var Bens., Bens. col., Ind."); UMZC I.103480 (single disarticulated specimen from the McAndrew collection labelled "*Unio Favidens* Var Bens., Bens. col., Ind."); UMZC I.103515 (single disarticulated specimen from the McAndrew collection labelled "*Unio Favidens* Var Bens., Bens. col., Ind." with "typical juv" added in different handwriting); UMZC I.103495 (single disarticulated specimen from the McAndrew collection labelled "*Unio Favidens* Var Bens., Bens. col.", no locality data); UMZC I.103460 (single disarticulated specimen from the McAndrew collection labelled "*Unio Favidens* Var Bens., Bens. col.", no locality data); UMZC I.103490 ("Nerbudda" is written in pencil on the interior of one valve). McAndrew labelled further material "*Unio* (*Hydridella*) *Favidens* Var Bens., Bens. col., Ind."; UMZC I.103455 ("Benson" is written in pencil on the exterior of the shell); UMZC I.103510, UMZC I.103465 ("Young", 3 paired valves); NHMUK 1907.12.30.43 (single shell

from the H. Harvey collection labelled "*Unio favidens* Bens, India, from type, original, Fig[d] in *Conch. Ind.* Pl. XI f. 1, 1a, from Hanley Coll.")

Type locality India: "Habitat in fluvio Gange superiore" [lives in the upper Ganges river]

Remarks Benson acquired numerous examples of this species during the long period of time that elapsed between collecting his first specimen and publishing his description, but singled one out as the holotype: "This fine shell, the type of the species, was taken by me in the Ganges at Bhitoura, between Cawnpore and Allahabad, in 1824, and the outline of it was figured in plate 7. fig. 1 of the 1st volume of '*Gleanings in Science*' for 1829" (**Fig. 108 C**). Theobald (1860: 128) recorded an unknown number of specimens donated by "Mr Benson" from the "Ram Gunga" in the collection of the Asiatic Society. Johnson (1956: 115) mentioned three specimens in the Museum of Comparative Zoology, Harvard (MCZH 175559), "*Unio flavidens* [sic] Benson, Ganges R., India, ex Benson, co-types".

Unio favidens var. *chrysis* Benson, 1862 [70]

Accepted as *Parreysia corrugata* (O.F. Müller, 1774); *Mya corrugata* Müller, 1774: 214

Unio favidens var. *chrysis* Benson, 1862b: 189; Hanley and Theobald, 1872 [in 1870–1876]: 19, Pl. 41, Fig. 3

Parreysia (*Parreysia*) *favidens* var. *chrysis* Benson; Preston, 1915: 160, Fig. 10; Ramakrishna and Dey, 2007: 301, Fig. 223

Parreysia (*Parreysia*) *favidens chrysis* (Benson); Subba Rao, 1989: 181

Material UMZC I.105235, **Fig. 109 A** (single articulated specimen from the R. McAndrew collection labelled "Bareilly", no collection data); UMZC I.103500 (two articulated specimens, no locality data); UMZC I.105020 (single articulated specimen from the R. McAndrew collection labelled "Humeerpore")

Original measurements: "Long. 27, lat. 35, diam. 16 mill.; single valves are long. 33, lat. 43 mill."

Type locality India: "River Dojora at Kareily Ghát, near Bareilly"

Remarks The number of specimens examined was not noted in Benson's original description, although he provided several different measurements indicating that there was more than one. Subba Rao (1989) claimed that the types were in the Zoological Survey of India (ZSI Reg. No M 2459/1), although this is unlikely.

Unio favidens var. *deltae* Benson, 1862 [70]

Accepted as *Parreysia corrugata* (O.F. Müller, 1774); *Mya corrugata* Müller, 1774: 214

Unio favidens var. deltae Benson, 1862b: 189; Hanley and Theobald, 1872 [in 1870–1876]: 19, Pl. 42, Fig. 2 (may not be figure of a type)

Parreysia (*Parreysia*) *favidens* var. *deltae* (Benson); Preston, 1915: 159

Parreysia (*Parreysia*) *favidens deltae* (Benson); Subba Rao, 1989: 181; Ramakrishna and Dey, 2007: 303, Fig. 225

Type material UMZC I.105025.A, **Fig. 109 B** (disarticulated holotype from the R. McAndrew collection with "R. Jellinghy" written in ink on the interior of one valve and an inscription written in pencil (probably in Hanley's handwriting) of the interior of the other that reads "Type of *Unio favidens* var *deltae*, Bens"); UMZC I.105025.B (second disarticulated specimen from the same lot)

Original measurements: "Long. 34, lat. 47, diam. 24 mill."

Type locality India: "River Jellinghy… in the upper part of the Gangetic Delta, Bengal"

Remarks Benson described one specimen: "I took a single specimen in the River Jellinghy, in 1831, in the upper part of the Gangetic Delta, Bengal." Subba Rao (1989) claimed that the types are at the Zoological Survey of India (ZSI Reg. No. M 16944/2) but UMZC I.105025.A is clearly labelled as the "type" and would therefore seem to have better claim for that status.

Unio favidens var. *densa* Benson, 1862 [70]

Accepted as *Parreysia corrugata* (O.F. Müller, 1774); *Mya corrugata* Müller, 1774: 214

Unio favidens var. densa Benson, 1862b: 189

Parreysia (*Parreysia*) *favidens* var *densa* Benson; Preston, 1915: 159.

Type material not located

Original measurements: "Long. 33, lat. 47, diam. 24 mill."

Type locality India: "Ganges River, above Chunár, between Allahabad and Benares"

Remarks For a full taxonomic history see Graf and Cummings (2013).

Unio favidens var. *marcens* Benson, 1862 [70]

Accepted as *Parreysia corrugata* (O.F. Müller, 1774); *Mya corrugata* Müller, 1774: 214

Unio favidens var. marcens Benson, 1862b: 188

Unio marcens Benson; Hanley and Theobald, 1872 [in 1870–1876]: 19, pl. 42, figs 4, 5, 6.

Parreysia (*Parreysia*) *favidens* var. *marcens* (Benson); Preston, 1915: 159; Ramakrishna and Dey, 2007: 304, Fig. 227

Type material UMZC I.103165.A, **Fig. 109 C** (one of two articulated syntypes from the R. McAndrew collection labelled "*Unio Marceus* Hanley =*Favidens*

Var *Marceus* Bens., Bens. col., Assam"); UMZC I.103170 (disarticulated syntype from the R. McAndrew collection labelled "*Unio Marceus* Var. Bens. ["Bens." later substituted by "Hanley"], Bens. col., Berhampooter")
Original measurements: "Long. 44, lat. 66, diam. 27 mill."
Other material NHMUK 1906.1.1.424 [re-registered in error as NHMNUK 1968629] (single shell from the W.T. Blanford collection labelled "*Unio marcens* Hanley, typical sp., figd in *Conch. Ind.* pl. XLII fig 5–6 for *U. favidens* var. *marcens* of Benson")
Type locality India: "From the Berhampooter River, Assam. Colonel Jenkins"
Remarks The number of specimens provided by Colonel Jenkins was not noted in Benson's original description. According to Ramakrishna and Dey (2007: 305) type material is present in the NHM but we have been unable to trace this: their reference might relate to the specimen supposedly figured in *Conchologia Indica*, although this is likely to have been labelled in error. Johnson (1956: 123) mentioned a "cotype" in the collection of the Museum of Comparative Zoology, Harvard (MCZH 175550), supposedly collected by Benson, but according to the museum register this specimen came from the collection of C.M. Wheatley and there is therefore nothing to link it to Benson's type series.

***Unio favidens* var. *trigona* Benson, 1862** [70]

Accepted as *Parreysia corrugata* (O.F. Müller, 1774); *Mya corrugata* Müller, 1774: 214

Unio favidens var. *trigona* Benson, 1862b: 188
Parreysia (*Parreysia*) *favidens* (Benson); Simpson, 1900: 842
Parreysia (*Parreysia*) *favidens* var. *trigona* (Benson); Preston, 1915: 159
Type material UMZC I.103475.A, **Fig. 110 D** (one of two disarticulated syntypes from the R. McAndrew collection labelled "*Unio Favidens* Var *Trigonis*, Bens. col.", one with with "Nujeebabad" written in pencil on interior surface); UMZC I.103505 (syntype from the R. McAndrew collection labelled "Bens. col., Ind." with "*trigona*" added to McAndrew's label in different handwriting)
Original measurements: "Long. 44, lat. 66, diam. 27 mill."
Other material UMZC I.103505 (single united specimen from the R. McAndrew collection with "Nujeebabad" written in pencil on interior surface, no collection data)
Type locality India: "From Nujeebabad, in the north-west of Rohilkhund"
Remarks The number of specimens was not noted in the original description.

***Unio favidens* var. *viridula* Benson, 1862** [70]

Accepted as *Parreysia corrugata* (O.F. Müller, 1774); *Mya corrugata* Müller, 1774: 214

Unio favidens var. viridula Benson, 1862b: 189
Parreysia favidens var. *viridula* (Benson); Preston, 1915: 160, Fig. 11
Parreysia (*Parreysia*) *favidens viridula* (Benson); Subba Rao, 1989: 182; Ramakrishna and Dey, 2007: 306, Fig. 229; for a full taxonomic history see Graf and Cummings (2013)
Type material not located
Original measurements: "Long. 27, lat. 40, diam. 17 mill."
Type locality India: "Standing water, or "jheel", between Humeerpore and Someerpore, Bundelkhund"
Remarks Subba Rao (1989) listed this form from Bihar (Damuda, Gandak, Manbhoom and Patna) and from West Bengal (Ranigange).

***Unio pinax* Benson, 1862**

Accepted as *Parreysia nagpoorensis* (Lea, 1860); *Unio nagpoorensis* Lea, 1860: 331

Unio Pinax Benson, 1862b: 192
Unio favidens var. *pinax* Benson; Hanley and Theobald, 1870 [in 1870–1876]: 6, Pl. 11, Fig. 2
Parreysia (*Parreysia*) *favidens* var. *pinax* (Benson); Preston, 1915: 161, Fig. 13 (type)
Type material UMZC I.105035.A–B, **Figs 110 A–B** (two syntypes [isolated valves] from the R. McAndrew collection, writing inside one of which reads "R. Gungun 1831")
Original measurements: "Long. 30, lat. 48, diam. 21 mill."
Other material NHMUK 20200351 (disarticulated specimen from the S. Hanley collection labelled "*pinax* B^n, from type")
Type locality India: "Habitat in rivulo Gungun, prope Moradabad, Rohilkhund" [lives in the River Gungun, near Moradabad, Rohilkhund]
Remarks The number of specimens examined was not noted in Benson's original description. The specimen from the Hanley collection (NHMUK 20200351) might have originated from the Benson collection, most likely during the period Hanley had possession of it following Benson's death, but there is only circumstantial evidence to support this. Bolotov et al. (2022) have recently synonymised *Unio pinax* with *Parreysia nagpoorensis* (Lea, 1860).

Parreysia plagiosoma (Benson, 1862)

Unio plagiosoma Benson, 1862b: 191
Unio favidens var. plagiosoma (Benson); Hanley and Theobald, 1870 [in 1870–1876]: 6, Pl. 11, Fig. 3
Parreysia (*Parreysia*) *favidens* var. *plagiosoma* (Benson); Preston, 1915: 162, Fig. 14 (type); Ramakrishna and Dey, 2007: 305, Fig. 228; for a full taxonomic history see Graf and Cummings (2013)
Parreysia plagiosoma (Benson); Bolotov et al., 2022: 6
Type material UMZC I.103380, **Fig. 110 C** (disarticulated syntype from the R. McAndrew collection labelled "*Unio Plagiostoma* Bens., Bens. col., Assam"; on the interior of one valve is written "*plagiosoma*" and "*Unio favidens*" and an illegible locality and "Cane" is written on the other. Another isolated valve has "Moradabad" written in pencil on the interior); NHMUK 20200352 (disarticulated syntype from the S. Hanley collection labelled "*plagiosoma* B^{n}, from type, Bengal")
Original measurements: "Long. 26, lat. 39, diam. 18 mill.; Long. 22, lat. 32, diam. 15 mill."
Type locality India: "Habitat in flumine Cane, prope Banda, Bundelkhund" [lives in the Cane river, near Banda, Bundelkhund]
Remarks The number of specimens examined was not noted in Benson's original description, although his measurements. Hanley and Theobald (1870 [in 1870–1876]: 6) noted that "The beaks are eroded in the Bensonian type here figured". The specimen from the Hanley collection might also be a syntype given that he borrowed much of the Benson collection from McAndrew in the early 1870s and Theobald (1878: 144) thought that he had purchased some of Benson's types, although this recollection is not borne out by the material that remained in Hanley's collection.

Unio smaragdites Benson, 1862

Accepted as *Parreysia corrugata* (Müller, 1774);
Mya corrugata Müller (1774): 214

Unio smaragdites Benson, 1862b: 190; Hanley and Theobald, 1870 [in 1870–1876]: 5, Pl. 10, Fig. 5
Parreysia (*Parreysia*) *favidens* (Benson); Simpson, 1900: 843; 1914: 1110
Parreysia smaragdites (Benson); Preston, 1912: 299; Prashad, 1922b: 102 (as *Parreyssia*)
Parreysia (*Parreysia*) *smaragdites* (Benson); Preston, 1915: 163; Subba Rao, 1989: 185; Ramakrishna and Dey, 2007: 310, Fig. 233; Graf and Cummings, 2007: 312; for a full taxonomic history see Graf and Cummings (2013)
Type material UMZC I.103360.A–B, (two syntypes, one disarticulated specimen (**Fig. 111 A**) and an isolated valve (**Fig. 111 B**), from the R. McAndrew collection labelled "*Unio* (*Hyridella*) *Smaragdite*s Bens., Bens. col., Assam". "Brahmapootra" is written on the inside of the larger specimen)
Original measurements: "Long. 31, lat. 42, diam. 20 mill."
Other material UMZC I.105055 (two articulated specimens from "Little Gund[...]", no collection data)
Type locality India: "Habitat in fluvio Berhampooter, regionis Assamensis" [lives in the Berhampooter river, Assam region]
Remarks The number of specimens provided by Colonel Jenkins was not noted in Benson's original description. However, the account provided by Hanley and Theobald (1870 [in 1870–1876]: 5): "So rare a shell that the original types are the only examples known to us." suggests that there was more than one. Subba Rao (1989) claimed that the type is in the Zoological Survey of India (ZSI No. M 16946/2).

Unio triembolus Benson, 1862

Accepted as *Parreysia nagpoorensis* (Lea, 1860);
Unio nagpoorensis Lea, 1860: 331

Unio triembolus Benson, 1862b: 190; Hanley and Theobald, 1874 [in 1870–1876]: 43, Pl. 107, Fig. 2
Parreysia (*Parreysia*) *tavoyensis* var. *triembolus* Benson; Preston, 1915: 167
Parreysia (*Parreysia*) *triembolus* (Benson); Subba Rao, 1989: 186; Ramakrishna and Dey, 2007: 311, Fig. 234
Parreysia (*Parreysia*) *triembola* (Benson); Graf and Cummings, 2007: 311
Type material MCZH 175558, **Fig. 111 C** (one of three disarticulated syntypes labelled "*Unio triembolus* Benson, Ramgunga River, nr. Moradabad, ex Benson, co-types")
Original measurements: "Long. 47, lat. 57, diam. 27 mill.; Long. 45, lat. 62, diam. 27 mill.; Long. 44, lat 63, diam. 30 mill."
Other material UMZC I.105070 (single disarticulated specimen from the R. McAndrew collection with "Moradabad" written in pencil on the interior of one valve); NHMUK 1906.1.1.493 [re-registered in error as 1968634] (two specimens from the W.T. Blanford collection labelled "*Unio triembolus* Bs, Bhopal, Nerbudda, largest specimen fig^{d} *C.I.* Pl. CVII f.2")
Type locality India: "Hab. in flumine Ramgunga, prope Moradabad" [lives in the Ramgunga river, near Moradabad]
Remarks The type series consisted of specimens from several different localities, of which Benson provided measurements for three. He wrote that "smaller varieties of the more trigonal as well as of the oblique elongated form were taken by me in the River Goomty. I got a handsome variety of the first, with a green and olive epidermis, in the River Dojora, near Bareilly; and

from the Gungut River, near Monghyr, in Bahar, a shell which may possibly be a gibbous variety of the second." The UMZC specimen has been reidentified as '*triembolus* Bens' and the McAndrew label modified accordingly. It is therefore not included in the type series. Johnson (1956: 139) mentioned the three syntypes apparently from Benson in the collection of the MCZH, although it is not clear how these shells were acquired; it is possible that they were obtained as part of an exchange arranged by John G. Antony, first curator of malacology at Harvard (Adam J. Baldinger, pers. comm.). Subba Rao (1989: 186) claimed that the types are in the NHM but no specimens could be located there. Bolotov et al. (2022) have recently synonymised *Unio triembolus* with *Parreysia nagpoorensis* (Lea, 1860).

Tribe Unattributed

Genus *Balwantia* Prashad, 1919

***Balwantia soleniformis* (Benson, 1836)**

Anodonta soleniformis Benson, 1836b: 750
Anodon soleniformis (Benson); Theobald, 1860: 135
Spatha soleniformis (Benson); Hanley and Theobald, 1870; 5, Pl. 9, Fig. 1
Solenaia soleniformis (Benson); Simpson, 1900: 656; Preston, 1915: 132, Fig. 6; Subba Rao, 1989: 175; Ramakrishna and Dey, 2007: 279: 279, Fig. 203; Graf and Cummings, 2007: 312 (for a full taxonomic history see Graf and Cummings, 2013)
Balwantia soleniformis (Benson); Prashad, 1919: 290; Haas, 1969: 127; Bolotov et al., 2020: 5; 2022: 11; Pfeiffer et al., 2021: 428
Type material UMZC I.102275.A–B, **Figs 104 B–C** (two of three syntypes (disarticulated valves) from the R. McAndrew collection, with a label in Benson's handwriting (**Fig. 104 E**) that reads "Adult & young. Very rare. *Anodonta soleniformis* Benson. *Journal Asiatic Soc. Calcutta* Vol. 5 p. 750 1836". On the reverse it reads: "*Spatha soleniformis* B. 4/6/56. NB D'Orbigny has a South American "*soleniformis*." (Mycetopoda?/[...]? His Synopsis terr & fluviatilium moll [...] is 1835. His Voyage dans l'Amérique Méridionale is 1839–1840")
Original measurements: "Lat. prope apicem 1.2, Lat. prope alam 1.5 poll."
Type locality Bangladesh: part of a collection "chiefly made in the hills on the N.E. Frontier of Bengal"
Remarks The number of specimens examined was not noted in Benson's original description, which was based on material in the collection of the Asiatic Society. Blanford (1866: 150) later remarked "The type specimen is in the Asiatic Society's Museum", which may be a reference to material in that collection from the "Barhampooter R." listed by Theobald (1860). Both Godwin-Austen (1919) and Annandale (1919) provided details of the ecology of this bivalve, which can usually be found only when the rivers containing it are extremely low in the height of the dry or cold season. They burrow into shale bedrock, where the surface is irregular or shelved and where the current is relatively swift. Prashad (1919) designated this species as the type of *Balwantia*, a genus recently resurrected by Bolotov et al. (2020) and provisionally placed within Parreysiinae (Pfeiffer et al., 2021; Bolotov et al., 2022).

Superfamily CYRENOIDEA

Family CYRENIDAE [71]

Genus *Corbicula* Megerle von Mühlfeld, 1811

***Corbicula fuscata* Benson, 1842**

Accepted as *Corbicula fluminalis* (O.F. Müller, 1774); *Tellina fluminalis* Müller, 1774: 205

Corbicula fuscata Benson, 1842b: 490
Type material OUMNH.ZC.MO25565, **Fig. 112 A** (one of two disarticulated syntypes from the T. Cantor collection labelled "11, *Corbicula fuscata*"); NHMUK 1842.9.30.27–28 (two syntypes presented by the Hon. East India Company labelled "*Corbicula fuscata* Cantor, canals, Island of Chusan")
Original measurements: "Lat. 1.3, long. 1.15 poll."
Type locality China: Chusan: "Canals"
Remarks The number of specimens provided by Theodore Cantor was not noted in Benson's original description. In the expanded version of his paper on Chusan shells, Benson attributed the species to Lamarck (Benson, 1855: 138), and it is not clear if this was his intention in the 1842 version. He also included Cantor's observation that this species was "Found in the mud of the canals; sold in the market" (Benson, 1855a: 138). Preston (1915: 212) also attributed *C. fuscata* to Lamarck and listed in the synonymy of *Corbicula fluviatilis* (O.F. Müller).

Genus *Villorita* Gray, 1833 [72]

***Corbicula quilonica* Benson, 1860** [73]

Accepted as *Villorita cyprinoides cochinensis* (Hanley, 1859); *Cyrena cochinensis* Hanley, 1859: 543

Corbicula quilonica Benson, 1860g: 260; as *quilonica*, Prime, 1866 [in 1864–1870], 8: 224; Preston, 1915: 219
Type material MCZH 187460, **Fig. 112 B** (lectotype designated by Johnson (1959: 468) labelled "*Corbicula quilonensis* 'Benson', Quilon, Madras, India, Old

M.C.Z. Prime colln., Holotype"); UMZC I.103195, **Fig. 112 C** (one of four paralectotypes, two articulated, one pair of disarticulated valves and another isolated valve, from the R. McAndrew collection labelled "*Velorita quilonica*, British India". Another label in Hanley's handwriting states "THE TYPES")
Original measurements: "Lat. 10, long. 8, crass. 5½ mill."
Other material UMZC I.105045 (four articulated specimens and an isolated valve from the McAndrew collection labelled "*Corbicula quilonica*, Quilon", no collection data); UMZC I.105050 (single articulated specimen and two specimens with disarticulated valves from the R. McAndrew collection labelled "*Corbicula quilonica*, Quilon", no collection data)
Type locality India: "Habitat prope Quilon in stagno cum Clea Annesleyi" [lives near Quilon in ponds with *Clea annesleyi*]
Remarks Benson based his original description on several specimens collected by his son, Charles Annesley Benson. These represented an ontogenetic series: "The younger shells are more gibbous towards the umbones in proportion to their length than the larger specimens" and noted that the water containing this species (and "*Clea annesleyi"*) was probably brackish. In a subsequent paper, Benson (1862a) assigned this species to *Batissa* on the basis of a more mature specimen, but he later obtained an adult specimen, which led him to synonymise *Corbicula quilonica* with *Cyrena cochinensis* Hanley, 1859 described from Cochin on the Malabar coast (Benson, 1864d: 497). Prime (1866: Fig. 56) illustrated a specimen of "*quilonensis*" [sic] in his collection that was subsequently donated to the MCZH (Prime, 1895). This later publication mentioned that the source of the specimen (MCZH 187460) was "Ex auctore." (i.e. Benson), which would make it a syntype, and it was subsequently selected as the lectotype of *C. quilonica* (Johnson, 1959: 468). However, it has a more triangular shape than the paralectotypes in the UMZC. There has been confusion regarding the specific name *cochinensis* since it has been used by both Hanley (1859) for a *Cyrena* and by Preston (1916: 36, Fig. 12, 12a, b), for a *Corbicula*. However, both of these are congeneric, and there is a possibility that the genus *Velorita* (misprinted *Villorita*), to which Hanley's taxon is often referred (e.g. Preston, 1915: 210), may also be congeneric. Indeed, the status of *Villorita* as a genus distinct from *Corbicula* remains unresolved (Glaubrecht et al., 2007: 268). Moreover, the validity of *V. cochinensis* Hanley as a distinct species has also been questioned with several authors (e.g. Prashad, 1921b: 116) merely regarding it as a variety of *V. cyprinoides* (Gray, 1825). The main characters of var *cochinensis* are the more centrally situated and less oblique umbones, much shorter and more regularly curved anterior side, greatly reduced lunules and the ridges on the surface are more marked than in the typical form, but quite obsolete near the margins (Prashad, 1921b: 116–117, Fig. 2b).

Superfamily MACTROIDEA

Family MACTRIDAE

Subfamily TANYSIPHONINAE

Genus *Tanysiphon* Benson, 1858

Tanysiphon rivalis Benson, 1858

Tanysiphon rivalis Benson, 1858b: 408, pl. 12B, figs 1–3; Hanley and Theobald, 1874 [in 1870–1876]: 47, Pl. 116, Fig. 1; Preston, 1915: 201; Owen, 1959: 71–73, Fig. 11b; Subba Rao, 1989: 221; Ramakrishna and Dey, 2007: 333, Fig. 253
Type material NHMUK 1858.7.23.33, **Fig. 113 A** (syntype [isolated valve] presented by W.H. Benson labelled "*Tanysiphon rivalis,* Calcutta, India, W.H. Benson Esq."); UMZC I.102780 (disarticulated syntype from the R. McAndrew collection labelled "Calcutta", with a circular label in Benson's handwriting that reads "*Tanysiphon rivalis* [illegible words] WHB")
Original measurements: "Lat. 21, alt. 11, crass. 9 mill."
Other material UMZC I.102790 (four valves from the R. McAndrew collection labelled "Calcutta", no collection data)
Type locality India: "Habitat in rivo, prope urbem Calcutta Bengalensem" [lives in the river near the town of Calcutta, Bengal]
Remarks Benson based his original description on more than one specimen, referring to a shell he found in 1846 "on the muddy shore of Tolly's Nullah, near the bridge leading to Allipore" and material obtained ten years later by Theodore Cantor that included "specimens received in spirits". This species often inhabits estuarine waters but sometimes extends into freshwater. This is the type species of *Tanysiphon* Benson, 1858 by monotypy.

Superfamily TELLINOIDEA

Family PSAMMOBIIDAE

Genus *Iridona* M. Huber, Langleit & Kreipl, 2015 [74]

Iridona iridescens (Benson, 1842)

Sanguinolaria iridescens Benson, 1842b: 490; 1855a: 138
Tellina iridescens (Benson); Hanley, 1846: 286, Pl. 58, Fig. 88
Moerella iridescens (Benson); Bernard et al., 1993: 93
Iridona iridescens (Benson); Huber et al., 2015: 628

Type material OUMNH.ZC.MO25567, **Fig. 113 C** (disarticulated syntype from the T. Cantor collection labelled "13, *Sanguinolaria iridescens*"); NHMUK 1842.9.30.56–58, **Fig. 113 D** (one of three syntypes, two disarticulated specimens and a single valve, presented by the Hon. East India Company labelled "*Sanguinolaria iridescens* Cantor, said to inhabit canals, Chusan")
Original measurements: none given
Type locality China: Chusan. "Said to inhabit canals"
Remarks The number of specimens provided by Cantor was not noted in Benson's original description, although he later stated that only dead shells had been collected (Benson, 1855a: 138). *Sanguinolaria iridescens* has recently been designated as the type species of the new genus *Iridona* Huber, Langleit & Kreipl, 2015. *Iridona iridescens* lives in East China but its broader distribution is unclear due to confusion with similar species (Huber et al., 2015: 629).

Superfamily SOLENOIDEA

Family PHARIDAE

Subfamily PHARELLINAE [75]

Genus *Novaculina* Benson, 1830

***Novaculina gangetica* Benson, 1830**

"*Anodonta* ? B"; Benson, 1829d, Plate VII, Fig. 4
Novaculina gangetica Benson, 1830b: 65; Sowerby, 1839: 118, Fig. 63; Benson, 1858b, Plate XII B, Fig. 4; Hanley and Theobald, 1874 [in 1870–1876]: 47, Pl. 116, Fig. 7; Preston, 1915: 229; Subba Rao, 1989: 223; Ramakrishna and Dey, 2007: 334, Fig. 254; Bolotov et al., 2018: 8
Solecurtus novaculina Reeve and Sowerby, 1874 [in 1873–1874], 19 (*Solecurtus*): pl. 7, figs 31a–b
Type material UMZC I.102125.A (articulated syntype from the R. McAndrew collection labelled "*Novaculina Gangetica* Bens., Bens. col., Calcutta" (**Fig. 114 A**) here designated as the lectotype); UMZC I.102125.B–K (ten syntypes, all disarticulated valves, from the same lot); NHMUK 1954.6.2.1287, **Fig. 114 D** (disarticulated syntype from the J.S. Hawkins Collection labelled "*Novaculina gangetica* Benson, Paratype, Ganges, Calcutta, W.H. Benson 1861"); NHMUK 20190445 (three syntypes, all once articulated but two now separate, from the Cuming collection labelled "Mr Benson, M.C. [Museum Cuming]")
Original measurements: none given
Other material UMZC I.105030 (single disarticulated specimen from the R. McAndrew collection labelled "Tenasserim River", no collection data)
Type locality India: "Inhabits the Jumna, Gumti, and Ganges"
Remarks Benson based his description on several specimens: "Mr. G.B. Sowerby, to whom I forwarded dead, and therefore imperfect specimens of the shell, in 1828, will have hardly failed to characterise the genus ..." (Benson, 1830b: 65). He had illustrated one of these (identified as "*Anondonta* ? B") as a simple line drawing (**Fig. 114 B**) in an earlier publication (Benson, 1829d), but clearly also obtained living specimens that enabled him to publish much more detailed illustrations of the anatomy (**Fig. 115 C**) much later (Benson, 1858b). He noted "The living specimens, from which I drew the characters, were procured in large communities by digging in a strong slaty clay in the banks for the River Jumna, at Humeerpore in Bundelkund, one thousand miles from the sea by the river line. The dead shells had previously occurred to me in the Ganges, and in the Goomty at Juanpore, between Lucknow and Benares." (Benson, 1858b: 409). NHMUK 1954.6.2.1287 is from a batch of specimens sent by Benson to J.S. Hawkins in March 1861 [ZOO_MSS_HAW]. UMZC I.105030, although probably originally from the Benson collection, does not form part of the type series. It is likely to be the specimen listed in *Conchologia Indica* as *Novaculina gangetica* var. *theobaldi* Benson (Hanley and Theobald, 1874: 48), although Benson never formally described this variety. *Novaculina gangetica* is the type species of *Novaculina* Benson, 1830 by monotypy. Bolotov et al. (2018) recently described a new species of *Novaculina* from Burma (*N. myanmarensis*), and clarified the range of the genus across Southeast Asia.

TAXONOMIC NOTES

[1]Sometimes included in *Aphanoconia* A.J. Wagner, 1905 but here provisionally retained in *Pleuropoma* following recommendation from Dr Ira Richling (*pers. comm*.)

[2]Eight subgenera of *Cyclophorus* were recognized by Kobelt (1902), one of which, the African *Maizania* Bourguignat, 1889, was elevated to family level Maizaniidae by Tielecke (1940). Gude (1921) mentioned only five subgenera: *Glossostylus* Kobelt & Möllendorff, 1897 (S and SE Asia), *Litostylus* Kobelt & Möllendorff, 1897 (S and SE Asia), *Salpingophorus* Kobelt & Möllendorff, 1897 (S and SE Asia), *Cyclophorus* Montfort, 1810 (S and SE Asia) and *Cyclohelix* Mörch, 1852 (Andaman and Nicobar Islands). Wenz (1939: 458–460) replaced *Cyclohelix* with *Otopoma* Gray, 1850, while Egorov (2006) replaced *Litostylus* by *Kobeltostylus* Egorov, 2006 since *Litostylus* Kobelt & Möllendorff, 1897 is

preoccupied by *Litostylus* Faust, 1893, a genus of Coleoptera. Egorov and Greke (2007) regarded *Salpingophorus* as a junior synonym of *Cyclophorus*.

[3]The type species of *Lagocheilus* W.T. Blanford, 1864 is *Cyclostoma scissimargo* Benson, 1856, by original designation (*Lagochilus* Kobelt & Möllendorff, 1897 is an unjustified emendation under ICZN, 1999, Article 32). Gude (1921: 11) and other workers referred *C. scissimargo* and other taxa now included in *Lagocheilus* to *Japonia* Gould, 1859 but the status of this genus is uncertain (see discussion in Raheem et al., 2014: 149) and has been shown to be polyphyletic (Lee et al., 2008).

[4]Nevill (1878) regarded *Scabrina* W.T. Blanford, 1863 as a subgenus of *Cyclophorus* Montfort, 1810 but Kobelt and Möllendorff (1897) raised it to full genus rank. *Cyclophorus pinnulifer* Benson, 1857 was fixed as the type species of *Scabrina* by Nevill (1878: 277).

[5]*Pterocyclus* Agassiz, 1848 is an unjustified emendation (ICZN, 1999, Article 32) of *Pterocyclos* Benson, 1832.

[6]This group has been treated as a subfamily of Cyclophoridae and a family in its own right. Tarruella and Domènech (2011) recognized four genera within Alycaeinae, namely *Alycaeus* J.E. Gray, 1850, *Chamalycaeus* Möllendorff, 1897, *Cipangocharax* Shintaro, 1934 and *Dioryx* Benson, 1859. However, *Cycloryx* Godwin-Austen, 1914, *Dicharax* Kobelt & Möllendorff, 1900 and *Metalycaeus* Pilsbry, 1900 have recently been raised to generic rank (Páll-Gergely et al., 2017a). Páll-Gergely et al. (2016) described the detailed structure and function of the external sutural tube that lies behind the aperture of all Asian members of the Alycaeidae; this character, in combination with the unique position of the bursa copulatrix, appears to justify family-level status (Páll-Gergely et al., 2020a).

[7]The taxonomic arrangement of the Pupinidae follows Tielecke (1940).

[8]*Streptaulus* Benson, 1857 and *Rhaphaulus* L. Pfeiffer, 1856 have often been regarded as congeneric but their generic distinction has recently been upheld by Páll-Gergely et al. (2017b).

[9]Chinh and Páll-Gergely (2020) resurrected *Coptocheilus* Gould, 1862 for this genus on the basis that this is not a junior homonym of *Coptochilus* Amyot & Serville, 1843 and that *Schistoloma* Kobelt, 1902 is therefore an unnecessary replacement name. There has also been confusion about the authorship and spelling of the species name (see entry for *Coptocheilus funiculalum* Benson, 1838).

[10]Recent molecular phylogenetic analyses on *Pollicaria* (Minton et al., 2017: Fig. 4) suggest that this genus may merit separation in a separate subfamily.

[11]Rao (1931) proposed *Angulyagra* as a replacement name for *Dactylochlamys* Rao, 1925, a name preoccupied by *Dactylochlamys* Lauterborn, 1901.

[12]Taxa currently placed in the Semisulcospiridae were previously united in the Pleuroceridae *s.l.*, but recent studies have demonstrated that Asian and western North American semisulcospirids form a clade that is morphologically distinct from eastern North American forms (i.e. Pleuroceridae *s.s.*) and the two are supported as reciprocally monophyletic in analyses of 16S mtDNA sequences (Lydeard et al., 2002; Strong and Köhler, 2009; Strong et al., 2011).

[13]*Buccinum scabrum* O.F. Müller, 1774 has been assigned to at least four genera including *Plotia* Röding, 1798, *Plotiopsis* Brot, 1874, *Pseudoplotia* Forcart, 1950 and *Thiara* Röding 1798. According to Low and Tan (2014) the genus *Pseudoplotia*, which had become widely used for this taxon, is not an available name as it does not fulfill Articles 13.1, 13.2 or 13.3 of the Code (ICZN, 1999: 17). They consequently erected the new genus *Mieniplotia* to accommodate it, a view provisionally followed here.

[14]*Assiminia fasciata* Benson was proposed in the mistaken belief that *Turbo francesii* Wood, 1828 was invalid; *A. fasciata* is not an available name.

[15]*Gabbia* is sometimes regarded as a subgenus of *Bithynia* (e.g. Glöer and Bössneck, 2013).

[16]It is probable that *Stenothyra cingulata* is conspecific with *S. monilifera* Benson, 1856 (Davis et al., 1986).

[17]Attribution to *Nassodonta* and inclusion within the subfamily Anentominae follows Strong et al. (2017).

[18]There has been ambiguity about the family attribution. Thiele (1926) created the subfamily Bullactinae (included in Atyidae) specifically for this species, whereas Burn and Thompson (1998) gave it family status (Bullactidae). It has frequently been attributed to the Haminoeidae and has sometimes even been included in the Philinidae (e.g. Pilsbry, 1895). Recent phylogenetic analyses of the Cephalaspidea

have indicated that *Bullacta* falls within the Haminoeidae (Malaquias, 2010; Oskars et al., 2015).

[19]The previously accepted family-level taxonomy of the Cavolinioidea that recognized the Cavoliniidae, Cuvierinidae, Cliidae and Creseidae was not supported in recent molecular phylogenetic analyses (Burridge et al., 2017).

[20]We transfer *Camptonyx* from the Succineidae to the Lymnaeoidea because, as can be seen from the figure in the original description, its tentacles are triangular rather than tubular and the eyes are situated at their base. Schileyko (2007: 2094) likewise doubted the inclusion of *Camptonyx* within the Succineidae.

[21]According to Baker (1945: 106) *Polypylis* differs generically from *Segmentina* (and *Intha*) in the absence of a penial gland in the preputium but others have questioned the phylogenetic significance of this generic separation (e.g. Hubendick, 1955: 532–533). However, in a recent phylogenetic study of the Planorboidea, the Segmentinini were shown to be a sister-group of the Planorbini and within the Segmentinini *Polypylis* was sister to *Hippeutis* with *Segmentina* as a sister-group to both (Albrecht et al., 2007).

[22]*Planorbis umbilicalis* Benson, 1836 was designated the type species of *Helicorbis* Benson by Baker (1945: 106). However, the taxonomic status of *Helicorbis* remains to be determined (cf. Albrecht et al., 2007).

[23]Brandt (1974) placed *caenosus* in the synonymy of *trochoideus*, but the latter has internal septa unlike the former. However, we do accept Brandt's synonymy of *caenosus* and *umbilicalis*, neither of which have internal septa.

[24]Some authors (e.g. Kennard and Woodward, 1926) have regarded *Planorbis trochoideus* Benson, 1836 as a junior synonym of *Segmentina nitida* (O.F. Müller, 1774).

[25]Bouchet et al. (2017) treated the Carychiinae as a subfamily of the Ellobiidae but others (e.g. Harbeck, 1996; Weigand et al., 2013) have argued for the separation of the Carychiidae as a distinct family, a view accepted here.

[26]We accept Benson's original attribution of *Coilostele* to the Ellobioidea (Benson's Auriculacea), as supported by Naggs (1997), and follow Pilsbry (1946b: 1051) in attributing *Coilostele* to the Carychiida.

[27]Fontanilla et al. (2017) showed that the Achatinoidea consists of the Achatinidae and Coeliaxidae as sister groups and *Ferussacia* as a sister group to the Achatinidae and Coeliaxidae.

[28]New evidence (Fontanilla et al., 2017) places *Cecilioides* within Achatinidae rather than within Ferussaciidae (Bouchet et al., 2017).

[29]*Tortaxis* is a sister group to *Glessula* in the molecular phylogenetic tree of Fontanilla et al. (2017).

[30]*Rishetia* was described by Godwin-Austen (1920: 7) as a subgenus of *Glessula*. It includes *R. longispira*, *R. tenuispira* (see Godwin-Austen, 1920: 33) and other species. We follow Budha et al. (2017a) in maintaining this generic distinction and do not include *Rishetia* in a separate subfamily, the Rishetiinae (*contra* Schileyko, 1999).

[31]If the Cecilioidinae is recognized as a subfamily on the basis of data presented by Fontanilla et al. (2017), then it follows that their sister group, a clade including *Eutomopeas, Paropeas, Allopeas, Leptinaria, Thyrophorella* and *Pyrgina*, should also be recognized at subfamily level for which the Thyrophorellinae Girard, 1895 has family-level priority.

[32]Pilsbry (1946a) proposed *Eutomopeas* as a replacement name for *Tomopeas* Pilsbry, 1906, which was preoccupied by *Tomopeas* G.S. Miller, 1900, a genus of Peruvian bat. Pilsbry treated *Eutomopeas* as a subgenus of *Opeas* whereas Zilch (1959: 349) listed it as a subgenus of *Lamellaxis*. *Eutomopeas* has since been elevated to generic rank (Schileyko, 1999: 533; Naggs et al., 2003, Raheem et al., 2006a). Schileyko (1999) placed *Eutomopeas* in his Rishetiinae, together with *Tortaxis* and *Bacillum* Theobald, 1870*,* but in the molecular tree of Fontanilla et al. (2017), *Eutomopeas* falls within a clade that includes *Allopeas* and *Prosopeas* and these form a sister group to *Leptinaria* H. Beck, 1837.

[33]An extinct group known only from its shell and radula; its affinities are uncertain. Based on data presented by Fontanilla et al. (2017) we provisionally include it in the Coeliaxidae, which includes *Bocageia* Girard, 1893*, Coeliaxis* H. Adams & Angas, 1865 and *Riebeckia* E. von Martens, 1883.

[34]The internal anatomy of *Curvella* has not been described, and it has not been included in a molecular phylogenetic study, so its systematic position is uncertain.

[35]The systematic position of this carnivorous snail is uncertain (Naggs, 1994).

[36]We follow the recent revision of Diapheridae proposed by Páll-Gergely et al. (2020b), who placed *Pupa planguncula* Benson, 1863 in a new genus *Pupennea*.

[37]Molecular data demonstrate that the Plectopylidae and Corillidae are not sister groups (Raheem et al., 2017).

[38]Recognition of subfamilies follows Páll-Gergely (2018).

[39]Schileyko (1986) proposed the Trachcystinidae to accommodate these African charopids but Bouchet et al. (2017) included this within the Charopinae.

[40]Watson (1934) undertook a revision of *Trachycystis* Pilsbry and proposed several new subgenera based largely on anatomical characters. These taxa have now been elevated to generic rank.

[41]The generic attribution of *Trachycystis sabuletorum* is uncertain. Connolly (1939: 203) mentioned four species that he included in the "Group of *sabuletorum* Bs", which he placed between *Phaulocystis* H. Watson, 1934 and *Xerocystis* H. Watson, 1934.

[42]*Luinodiscus* Iredale, 1937 was rejected by Vaught (1989: 144) but is considered a valid genus by Stanisic et al. (2018), a view followed here. The subfamily attribution is uncertain.

[43]We provisionally follow Godwin-Austen (1907 [in 1897–1914]) by including *Thysanota*, *Philalanka* and *Sykesia* (=*Ruthvenia*, *Sykesia* being pre-occupied) in the Thysanotinae and Bouchet et al. (2017) in placing the Thysanotinae in the Charopidae.

[44]The use of Bothriembryontidae follows Breure and Romero (2012).

[45]The use of the generic name *Microstele* Pilsbry, 1921 and the placement of species in this genus follows Pilsbry (1921: 147–148).

[46]The use of *Gittendouardia* Bank & Menkhorst, 2008 and the placement of *arenicola* in this genus follows Bank and Menkhorst (2008: 101).

[47]*Pseudonapaeus* Westerlund, 1887 has page priority over *Subzebrinus* Westerlund, 1887 (Schileyko, 1998b) and according to Bank and Neubert (1998: 82) they are synonymous.

[48]The use of the generic name *Mirus* Albers, 1850 follows Vaught (1989) and the placement of species in this genus follows Gude (1914a).

[49]*Fauxulus* and its subgenera were classified within the Odontocycladinae (family Orculidae) by Hausdorf (1996) and Schileyko (1998a) but a recent molecular phylogeny indicated that these genera are not closely related to the Orculidae but form a sister group within the Orthurethra. A new family, Fauxulidae Harl & Páll-Gergely, 2017, has been proposed to accommodate these African taxa (Harl et al., 2017).

[50]The use of the generic name *Gastrocopta* Pilsbry 1917 and the placement of species in this genus follows Pilsbry (1917).

[51]*Bensonella*, *Hypselostoma* and the recently described *Angustopila* Jochum, Slapnik & Páll-Gergely, 2014 have all been included in the Hypselostomidae (Schileyko, 1998b; Jochum et al., 2014; Páll-Gergely et al., 2015c) but Bouchet et al. (2017) regarded this family as a synonym of the Gastrocoptidae.

[52]Recognition of the Lauriidae at family rank follows Hausdorf (1996).

[53]Treatment of *Truncatellina* follows Nekola and Coles (2016).

[54]Attribution to *Truncatellina* follows Pokryszko et al. (2009: 429).

[55]Valloniidae may be polyphyletic (Nekola and Coles, 2016).

[56]Treatment of subspecies follows Nordsieck (2007).

[57]Nordsieck (2002) described *Montiphaedusa* as a subgenus of *Cylindrophaedusa* with *Cylindrophaedusa* (*Montiphaedusa*) *ioes* (Benson) as the type species.

[58]Wiktor et al. (2000) treated *Incilaria* Benson, 1842 as a junior synonym of *Meghimatium* van Hasselt, 1823.

[59]Attribution of *Louisia* to the Euconulidae has been confirmed by molecular phylogenetics (Wade et al., 2006).

[60]This species was formerly placed in the genus *Cryptozona* Mörch, 1872 because it has a dextral shell, unlike *Ariophanta* (section *Ariophanta*), which possess sinistral shells (Blanford and Godwin-Austen (1908: 29–34). However, several genera of Asian land snails have both dextral and sinistral representatives and

chirality alone is not a sound basis for the separation of such genera. We therefore include this species within *Ariophanta* Desmoulins, 1829 (cf. Raheem et al., 2014).

[61]The species-rich genus *Macrochlamys* Gray, 1847, is based on the type species *Helix vitrinoides* Deshayes, 1831, the type material of which cannot be traced. From Deshayes's description, *Helix vitrinoides* is unlikely to belong to the currently accepted concept of *Macrochlamys* sensu Godwin-Austen, 1883 who designated *Macrochlamys indica* Benson as the type species. Neither *Macrochlamys* Benson, 1832, nor *Macrochlamys indicus* Benson, 1832 were made available by Benson (Raheem et al., 2014). Although Godwin-Austen (1883) attributed *Macrochlamys indica* to Benson, Benson had not provided a description and cannot be accepted as the author. *Macrochlamys indica* is therefore attributed to Godwin-Austen, 1883. *Tanychlamys* Benson, 1834 was introduced as a synonym of *Nanina* Gray, 1834 (Benson, 1834a: 89; see also 1836a: 350) but is an available name because it was used as a valid name prior to 1961 (Baker, 1941, 1943). The type species was subsequently designated as *Macrochlamys indica* Godwin-Austen, 1883 (Baker, 1941). In recognising *Tanychlamys* Benson, 1834 as having priority over *Macrochlamys*, Godwin-Austen's 1883 concept of *Macrochlamys*, with *Macrochlamys indica* Godwin-Austen, 1883 as the type species, is retained.

[62]Established as a replacement name for Peltatinae, because Connolly (1925: 467) treated *Peltatus* Godwin-Austen, 1908 as a synonym of *Sheldonia*. Peltatinae has not been used since its original description and Sheldoniinae is conserved under Art. 40.2, with the precedence of Peltatinae (Bouchet et al., 2017).

[63]Recent molecular phylogenetic studies (e.g. Wade et al., 2007) have demonstrated that Asian (and Australasian) camaenid taxa form a complex within the Bradybaenidae, with camaenid and bradybaenid taxa interspersed in the molecular tree. This provides support for Scott's (1996) suggestion that the Camaenidae and Bradybaenidae are confamilial. Gittenberger et al. (2012) formally treated the Bradybaenidae as a junior synonym of the Camaenidae, a view supported by Bouchet et al. (2017).

[64]The use of the generic name *Beddomea* G. Nevill, 1878 follows Vaught (1989) and the placement of species in this genus follows Gude (1914a).

[65]The use of the generic name *Trachia* E. von Martens, 1860 follows Vaught (1989) and the placement of species in this genus essentially follows Gude (1914a).

[66]Use of *Landouria* and the placement of *huttonii* follows Godwin-Austen (1918: 604). Schileyko and Kuznetsov (1998) argued that the absence of the accessory organs (mucus glands and dart sacs) are the result of secondary reduction and accordingly placed *Landouria* in the Bradybaenidae. However, Hirano et al. (2014) reported substantial incongruence between the morphology, taxonomy and molecular phylogeny of bradybaenid land snails including those belonging to *Aegista* and *Landouria*. It is likely that *Landouria* may be a synonym of *Aegista* but additional phylogenetic analyses are needed to provide confirmation.

[67]Morton et al. (2020) erected the subfamily Mytiliseptiferinae, which was subsequently corrected by Bouchet to Mytiliseptinae (http://www.marinespecies.org/aphia.php?p=taxdetails&id=1425324)

[68]The use of subfamilies and tribes within the Unionidae essentially follows Whelan et al. (2011), Lopes-Lima et al. (2017) and Bolotov et al. (2018a, 2022). Nesemann et al. (2005) published an illustrated checklist of the large freshwater bivalves in the Ganga River System, which covers many of the species listed here.

[69]Recent molecular studies of Southeast Asian unionids in the subfamily Parreysiinae introduced the new tribe Indochinellini with *Indochinella* as the type genus and *pugio* as the type species (Bolotov et al., 2018a) and synonymised various taxa at species level (Bolotov et al., 2020, 2022).

[70]*Unio favidens* Benson, 1862 is a highly variable species and several varietal names have been proposed for different forms. These forms are likely to be ecophenotypes with no real taxonomic significance, a view supported by a recent molecular analysis (Bolotov et al., 2022) that synonymised *favidens* and most of its named varieties with *Parreysia corrugata* (Müller, 1774).

[71]We follow Bouchet and Rocroi (2010) in using the Cyrenidae in preference to the Corbiculidae.

[72]The validity of the generic separation of *Villorita* Gray, 1833 and *Corbicula* is unresolved (Glaubrecht et al., 2007: 268).

[73]Benson (1864d: 497) synonymized his *Corbicula quilonica* with *Cyrena cochinensis* Hanley, 1859, a taxon now regarded as a variety of *Villorita cyprinoides* (Gray, 1825) (see Prashad, 1921b: 116). However, the systematics of species within *Corbicula* and the relations between this genus and other closely related ones (e.g. *Villorita*) is in urgent need of revision.

[74]The generic use of *Iridona* Huber, Langleit & Kreipl, 2015 with *I. iridescens* as its type species follows Huber et al. (2015).

[75]Novaculininae has recently been synonymized with Pharellinae (Bolotov et al., 2018b).

NOMINA NUDA

There are a number of lots in the Benson collection in the UMZC that purport to be taxa described by Benson. Some of these have simply been wrongly attributed to Benson by those who reorganised the collection (Hanley, McAndrew). However, there are quite a number of other taxa supposedly described by Benson that we have been unable to trace in the literature and which we assume represent manuscript names. We refrain from providing a full list of these here and instead provide details only of names that have appeared in print or which merit brief mention for other reasons.

beharicum, *Cyclostoma*

Cyclostoma beharicum Benson; Anon, 1832: 76
Type locality India: Patharghâta
Remarks This species, together with an un-named variety and a juvenile specimen, was listed among a series of land and freshwater shells presented to the Asiatic Society by Benson in early 1832 (Anon, 1832: 75–76).

bilinearis, Unio

Unio bilinearis Benson; Pearson, 1840: 728
Type locality India: “Found in a tank on the Esplanade of Fort William”
Remarks An unknown number of specimens identified as this species were included with a consignment of shells presented to the India Museum by the Asiatic Society (see Pearson, 1840: 728).

burmani, *Plectopylis*

Plectopylis karenorum Blanford, 1865: 73
Family Plectopylidae
Material UMZC I.104175 (three shells, one dissected)
Remarks Gude (1914a: 134) examined the three specimens in the UMZC labelled using Benson’s manuscript name “*Plectopylis burmani*” (probably a misspelling of *P. burmanica*) and concluded that they were conspecific with *Plectopylis karenorum* (W.T. Blanford, 1865).

denticulata, *Melania*

Remarks In his catalogue of freshwater molluscs in the Museum of the Asiatic Society, Benson (1836b: 748) listed “*Melania conica* Gray?” but noted that, although the museum specimens were similar to the figure of this species in Griffith and Pidgeon (1833–1834: Pl. 14, Fig. 3), the match was not perfect, especially with regard to presence of “obsolete sulcations of the shell” and the “smoothed denticulations which ornament the interior margin of the right lip”. He conditionally proposed the name “*Melania denticulata*” for this shell, “should it eventually prove to be distinct”.

extraneus, *Cyclophorus*

Cyclophorus extraneus Benson MS
Family/Subfamily Cyclophoridae, Cyclophorinae (Tribe Cyclophorini)
Material UMZC I.104105 (single shell from the R. McAndrew collection labelled “*Cyclophorus Extraneus* Bens., Bens. col., Khasiah Hills”. Another label reads “*Cyclostoma indicum*”)
Remarks Included with the UMZC specimen are two long notes written by Benson. One reads: "Figured in Chemnitz new editn. t33 f1.2. One of the Cyclost. wrongly referred by Sowerby in Thesaurus to *C. indicum* Deshayes, and by Pfeiffer erroneously referred to Mousson's Javanese *C. eximius* [*Cyclophorus rafflesi eximius*]. It is from the Khasia Hills N.E. India & belongs to Cyclophorus. I have called it in MS. *C. extraneus*. WHB." The second label reads, “Figured in Chemnitz [...] edtn. t33 f.1.2. Evidently one of the Cyclostomata which Sowerby in the Thesaurus (Suppl.) erroneously referred to *C. Indicum* Desh., and which Pfeiffer has since (also erroneously) referred to Mousson's Javanese *Cycl. eximium* [sic]. It is a species from the Khasyah Hills in the angle of the Brahampooter River NE of Bengal & belongs to *Cyclophorus* Montf. I have called it, in ms, *C. extraneus*. W.H.B.” Gude (1921: 46) included Sowerby’s (1850: 163; pl. 31b, figs 320, 321) *Cyclostoma indicum* (non Deshayes) in the synonymy of *Cyclophorus ceylanicus* L. Pfeiffer, 1849.

granulata, Helix

Helix granulata Benson, 1836a: 352 (non Alder, 1830: 39)
Type locality India: "Western Provinces"
Remarks Benson mentioned this species in his description of *Helix delibrata*, providing sufficient information to make the name available. However, he never formally described it and no specimens labelled as *H. granulata* Benson are known to survive.

indica, *Pupa*

Pupa indica Benson Mss in Hutton, 1849, non Pfeiffer, 1855a: 295
Remarks Hutton published the name *Pupa indica* in 1846 as a *nomen nudum* (Hutton, 1846: 562), clearly stating that he considered *P. caenopicta* Hutton, 1834 and *P. bicolor* Hutton, 1834 to be varieties of this species. He also used the name *Pupa indica* Benson Mss, giving it priority over his name *Pupa cylindrica* Hutton (the "No. 6" *Pupa* of Hutton, 1834; see Hutton, 1849: 653), which had been published in his original paper as "cylindrical?" (possibly a typographical error). However, it seems that he changed his mind about the varietal status of *P. caenopicta* and *P. bicolor* since his 1849 description of *P. indica* instead provided details of two un-named varieties ("Var. A." and "Var. B."), which Gude (1914a: 371) placed in the synonymy of *Zootecus pullus* (J.E. Gray, 1834). See also comments under *Pupa brevicostis*.

'layardi', *Eurychlamys*

Vitrina layardi Benson MS
Type locality Sri Lanka: Palabaddala, South-west of Adam's Peak
Family/Subfamily Helicarionidae, Durgellinae (Tribe Durgellini)
Material NHMUK 1912.8.16.347 (single shell from the E.L. Layard collection labelled "*Vitrina layardi* B.", Ceylon, Benson's Type")
Remarks An unpublished species of *Eurychlamys* with the manuscript name "*Vitrina layardi* Benson" (see Naggs and Raheem, 2000: Fig. 32).

littoricola, *Helix*

Remarks A manuscript name that Connolly (1939: 228) regarded as a synonym of *Xerocystis capensis* (L. Pfeiffer).

mammillata, *Succinea*

Remarks Reeve and Sowerby (1872: pl. 5, species 34) included an entry for this taxon from Chile, which they tentatively attributed to Benson. We have not been able to trace anything further about this species and presume it to be a *nomen nudum*.

mensula, *Helix*

Remarks *Helix mensula* Benson, listed as a *nomen nudum* by Theobald (1857: 249).

pausa, Helix

Remarks *Helix pausa* Benson, listed as a *nomen nudum* by Theobald (1857: 249).

petila, *Helix*

Remarks *Helix petila* Benson, listed as a *nomen nudum* by Theobald (1857: 249)

praemorsa*, *Paludina see ***Paludina remossii***

precaria, *Helix*

Remarks *Helix precaria* Benson, listed as a *nomen nudum* by Theobald (1857: 250)

prodigium, *Helix*

Helix prodigium Benson (*nomen nudum*)
Family Plectopylidae
Remarks Godwin-Austen (1875a) noted that among the species of *Plectopylis* at the NHM, one was labelled "*H. prodigium* Bs (Mus Cuming)", which he thought was likely to be the original manuscript name of *Endothyrella plectosoma* (Benson). The name "*prodigium*" was mentioned several times by subsequent authors (e.g. Tryon, 1887; Pilsbry, 1894 and Gude, 1899d) but it was never published formally.

puellula, *Helix*

Helix puellula Benson
Family/Subfamily Camaenidae, Camaeninae
Remarks Benson used this manuscript name in a report that he prepared for Theobald, and who subsequently published it (Theobald, 1858: 319). To avoid confusion with the similarly named *Helix puella* Broderip, 1841, Benson (1859f) subsequently described this species as *Helix acris* (see Gude, 1914a: 195).

remossii, *Paludina*

Paludina Remossii Philippi, 1847, vol. ii: 134, Pl. 2, Fig. 3 (misprinting of Benson's manuscript name *praemorsa*)
Paludina Remossii Benson; Küster, 1852, vol. I: 26, pl. 5, figs 17, 18
Paludina praemorsa Benson; Reeve, 1863 [in 1862–1864], 14 (Paludina): pl. 6, species 35
Paludina remossii Philippi; Hanley and Theobald, 1873 [in 1870–1876]: 33, pl. 77, figs 8, 9

Vivipara remossei (Philippi); Preston, 1915: 91
Family/Subfamily Viviparidae, Bellamyinae
Type locality Bengal
Remarks Philippi attributed this name to Benson but was uncertain about whether it had been formally published. Philippi's unfortunate misspelling of Benson's manuscript name as *Remossii* cannot simply be erased as suggested by Reeve (1863). According to Nevill (1885: 27) and Rao (1928: 417) *P. remossii* is a synonym of the highly variable *Bellamya dissimilis* (O.F. Müller, 1774).

sculpta, *Pupa*

Remarks Manuscript name listed by Reeve and Sowerby, 1876 [in 1875–1878], 20 (*Pupa*): pl. 7, species 58.

velaris, *Unio*

Remarks A manuscript name listed as a Benson species by Hanley, 1856 [in 1842–1856]: 385 and Reeve, 1868 [in 1864–1868]: pl. 72, species 368.

SPECIES ERRONEOUSLY ATTRIBUTED TO BENSON

aegyptiaca, *Melania*

Current name *Cleopatra bulimoides* Olivier, 1804
Melania aegyptiaca Benson MS in Reeve, 1860 [in 1859–1861], 12 (*Melania*): pl. 34, species 227
Family/Subfamily Paludomidae, Cleopatrinae
Type locality Egypt
Remarks Nevill (1885) listed this species as a synonym of *Cleopatra bulimoides* Olivier, 1804, a species that is broadly distributed in continental Africa (Brown, 2002).

amentum, *Achatina*

Current name *Glessula amentum* (Reeve, 1849)
Achatina amentum Benson MS in Reeve, 1849 [in 1848–1850], 5 (*Achatina*): pl. 17, species 82; Pfeiffer, 1853 [in 1847–1877]: 499; Benson, 1860h: 464
Achatina (*Electra*) *amentum* (Reeve); Hanley and Theobald, 1870 [in 1870–1876]: 16, Pl. 35, Fig. 3
Stenogyra (*Glessula*) *amentum* (Benson); Nevill, 1878: 169
Glessula amentum (Reeve, 1849); Pilsbry, 1909 [in 1908–1910]: 77, pl. 10, figs 1–4; Gude, 1914a: 419
Family/Subfamily Achatinidae, Glessulinae
Material UMZC I.102445 (single shell from the R. McAndrew collection labelled "*Oleacina* (*Electra*) *Irmentum* Rve = *Gemma* ?"); NHMUK 1946.10.16.80–81 (two shells from the R. McAndrew collection, presented by the UMZC, labelled "*Glessula amentum* Bens., Type?, Calcutta, Benson coll.")
Type locality India: Howrah, near Calcutta
Remarks Reeve (1849) noted "For this species I am indebted to Mr. Benson, who relates having taken three specimens alive in 1835, from beneath a fallen palm tree at Howrah, near Calcutta; and he is not aware that it has been collected since". Benson (1860h: 464) later reported a single specimen in poor condition found by William Theobald in "the Valley of the Upper Nerbudda", also noting that the species "is exceedingly rare, three specimens only having been taken by me in a living state twenty-five years ago. They were under a felled palm-tree (*Borassus flabelliformis*) in the Howrah bank of the river, between the Bishop's College and the Botanic Gardens".

ascia, *Unio*

Current name *Contradens contradens* (Lea, 1838)
Unio ascia 'Benson', Hanley, 1856: 385, Pl. 23, Fig. 20
Family/Subfamily Unionidae, Rectidentinae (Tribe Contradentini)
Type locality Penang
Remarks Johnson (1956: 106, Pl. 2, Fig. 2) designated a lectotype from a specimen (ex W.H. Benson) in the MCZH.

bacillum, *Clausilia*

Current name *Cylindrophaedusa* (*Montiphaedusa*) *bacillum* (Hanley & Theobald, 1870)
Clausilia (*Phaedusa*) *bacillum* Benson MSS in Hanley and Theobald, 1870 [in 1870–1876]: 12, pl. 24, Fig. 1 (non Theobald); Pfeiffer, 1877 [in 1847–1877]: 503
Clausilia (? *Medora*) *bacillum* Benson; Blanford, 1872: 200, pl. 9, Fig. 3; Stoliczka, 1872: 207
Phaedusa bacillum Benson; Boettger, 1878: 38
Cylindrophaedusa (*Montiphaedusa*) *bacillum* (Hanley & Theobald); Nordsieck (2002: 87)
Family/Subfamily Clausiliidae, Phaedusinae (Tribe Phaedusini)
Type locality India: Nanclai, Khasi Hills
Remarks Benson provided no description of this taxon, which was first illustrated by Hanley and Theobald (1870 [in 1870–1876]) on the basis of two specimens, one from Benson's collection and the other from Theobald's. Gude (1914a: 306) provided a detailed discussion of the nomenclature and synonymy relating to these specimens.

balanus, *Achatina*

Current name *Cecilioides balanus* (Reeve, 1850)
Achatina balanus Reeve, 1850 [in 1848–1850], 5 (*Achatina*): pl. 20, species 109; Pfeiffer, 1853 [in 1847–1877]: 506; Benson, 1864a: 137; Blanford, 1875: 43

Geostilbia balanus (Benson); Theobald, 1878: 147
Caecilianella (*Geostilbia*) *balanus* (Benson); Nevill, 1878: 162
Caecilioides (*Geostilbia*) *balanus* (Reeve); Pilsbry 1908 [in 1908–1910]: 46, pl. 4, figs 60, 61; Gude, 1914a: 374
Cecilioides balanus (Reeve); Raheem et al., 2014: 115, Figs 72D–F
Family/Subfamily Achatinidae, Cecilioidinae
Material UMZC I.102435.A (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 115); UMZC I.102435.B–G (six paralectotypes from the same lot); NHMUK 1848.9.15.71–85 (15 shells from the W. Boys collection labelled "*Achatina balanus*, Agra")
Type locality India: "Hab. banks of the Jumna, India"
Remarks This species was first collected by Benson in October 1826 "on the left bank of the Jumna opposite to Humeerpore" and was subsequently found in 1843 by Capt. W.J. Boys "at the Taj, near Agra", by Capt. T. Hutton "in the exuviae of the River Ganges" and in 1857 by William Theobald "at Gopnáth, in Kattiwár" (Benson, 1864a: 136). UMZC I.102435 consists of seven syntypes of this species, together with a single specimen of *Carychium boysianum*, stored in a quill (see Naggs, 1997: Fig. 7) on which was written "Balanus Achatina + Auricula Carychium, Taj Agra". This lot almost certainly represents the material collected by Boys (see entry for *C. boysianum*). UMZC I.102435.A is approximately 3 mm in length and thus agrees with Pfeiffer's (1853: 506) measurements and the figure and scale in Hanley and Theobald (1874 [in 1870–1876]: 41, Pl. 102, Fig. 10). UMZC I.102435.A also agrees with the figure in Reeve (1850, *Achatina*, No. 102), but not with the scale bar (length = 6.82 mm), and this is probably an error.

boysianus, *Bulimus*

Current name *Pseudonapaeus boysianus* (Reeve, 1849)
Bulimus boysianus Benson MSS in Reeve 1849 [1848–1850], 5 (*Bulimus*): pl. 78, species 575; Pfeiffer, 1853 [in 1847–1877]: 432; Hanley and Theobald, 1870 [in 1870–1876], 11, Pl. 22, Fig. 6
Buliminus (*Petraeus*) *boysianus* (Benson); Nevill, 1878: 136
Buliminus (*Subzebrinus*) *boysianus* (Benson); Kobelt and Möllendorff, 1903: 47
Ena (*Subzebrinus*) *boysiana* (Reeve); Gude, 1914a: 238
Subzebrinus boysiana (Reeve); Ramakrishna et al., 2010: 130
Family/Subfamily Enidae, Eninae (Tribe Enini)
Material UMZC I.105220 (single shell from the R. McAndrew collection labelled "*Bulimulus* (*Nepaeus*) *Boysianus* Bens., Bens. col., Kumaon")
Type locality India: Kemaon, Western Himalaya
Remarks According to Gude (1914a: 238) the type is missing, although UMZC 105220 is from the type locality and is likely to be part of Benson's type series. In India this species has been recorded from Himachal Pradesh, Uttarakhand and West Bengal (Ramakrishna et al., 2010: 130).

boysii, *Tomogeres*

Current name *Boysia boysii* (L. Pfeiffer, 1846)
Tomogeres boysii Benson in L. Pfeiffer, 1846 [in 1841–1846]: 82
Anostoma boysii Benson in L. Pfeiffer, 1847 [in 1847–1848]: 2; Benson, 1848b: 164; Benson, 1856h: 129
Boysia bensoni Pfeiffer, 1849c: 105; Hanley and Theobald, 1870 [in 1870–1876]: 4, Pl. 8, Fig. 1
Boysia boysii (L. Pfeiffer); Pilsbry, 1920–1921: 226, pl. 24, figs 14, 15, 16, 17
Boysia boysi (L. Pfeiffer); Gude, 1914a: 297; Ramakrishna et al., 2010: 122
Family/Subfamily Gastrocoptidae, Hypselostomatinae
Material UMZC I.104180 (two shells from the McAndrew collection labelled "W. Himalayas")
Type locality India: Bengal [Benson (1856h: 129) also mentions "Rajpootna"]
Remarks Pfeiffer (1846) originally described this species as *Tomogeres boysii* but later (1847) transferred it to *Anostoma*, both the generic and specific designations being apparently suggested by Benson, who published the name in 1848 (Benson, 1848b). Pfeiffer (1849c) subsequently realized that it could not been retained in *Anostoma* and created *Boysia* for its reception but unjustifiably used *bensoni* as its specific name (see Gude, 1914a: 296–297). This species has recently been found in the Arabian Peninsula, extending its known range westwards by some 4000 km (Neubert, 1998b).

butta, *Lymnaea*

Current name *Radix luteola* (Lamarck, 1822)
Lymnaea butta Benson, 1836b: 744 (*nomen nudum*) [intended spelling of *bulla* listed in Errata, J.A.S.B vol. 5 (1836): xxiv]
Lymnaeus bulla Benson MS in Küster, 1862: 1(17b): 37, plate 7 figs 1–2
Limnaea bulla Benson; Reeve and Sowerby, 1872 [in 1870–1872] 18 (*Limnaea*): pl. 9, species 59 (listed under *L. ovalis* Sowerby); Nevill (1878: 233) also listed *bulla* under *L. ovalis*
Lymnaea bulla Benson; Kobelt, 1880: 297, Pl. 88, Fig. 17
Family Lymnaeidae
Material UMZC I.104160 (eight shells from the R. McAndrew collection labelled "*Limnaea bulla* Bens = *luteola* Lam., Bens. col., Ind."); UMZC I.104155 (two

shells from "India"); NHMUK 1871.9.23.132 (two shells purchased from Robert Damon labelled "*bulla* Bens., Hooghly"); NHMUK 20200353 (three shells from the H. Cuming collection labelled "*Lym. Bulla* var. Benson, Calcutta, Benson"); NHMUK 20200354 (three shells, one now smashed, from the S. Hanley collection labelled "*bulla* Benson, from type, Moradabad, British India")

Type locality India: "Lehtára jhíl, near Banáras"

Remarks Benson (1836: 744) mentioned this name without description and is therefore a *nomen nudum* as previously recognized by Hubendick (1951). This taxon was figured by Küster (1862), who made the name available, and Kobelt (1880: 297) subsequently designated it the type species of his genus *Cerasina*. Hubendick (1951: 183) thought that this figure might represent *rubiginosa* Michelin or *lessoni* Deshayes, although Zilch (1959: 94) regarded it as a synonym of *Radix luteola* (Lamarck, 1822).

cassiaca, *Achatina*

Current name *Bacillum cassiacum* (Reeve, 1849)

Achatina cassiaca Benson MSS in Reeve, 1849 [in 1848–1850], 5 (*Achatina*): pl. 17, species 85; Pfeiffer, 1853 [in 1847–1877]: 499

Achatina (*Bacillum*) *cassiaca*; Hanley and Theobald, 1870 [in 1870–1876]: 17, Pl. 36, Fig. 5

Stenogyra (*Glessula*) *casiaca* (Benson); Nevill, 1878: 172

Bacillum casiacum (Reeve); Gude, 1914a: 345; Ramakrishna et al., 2010: 148 (as *B. cassiacum*)

Family/Subfamily Achatinidae, Glessulinae

Material UMZC I.102460 (five shells from the R. McAndrew collection labelled "*Subulina Cassaica* Bens., Bens. col., India"); UMZC I.105225 (two shells labelled "*Glessula* (*Bacillum) cassiaca* Bs. Hills NE of Munipur")

Type locality India: "Hab. Cassia Hills, North East Frontier of Bengal; Dr. Griffith"

Remarks The number of specimens was not noted in the original description. Reeve (1849) and Pfeiffer (1853) stated that the specimens were in the "Mus. Benson". This is the type species of *Bacillum* Theobald, 1870.

ceratinus, *Bulimus*

Current name *Nepaliena ceratina* (Reeve, 1849)

Bulimus ceratinus Benson MS in Reeve, 1849 [in 1848–1850], 5 (*Bulimus*): pl. 78, species 569; Pfeiffer, 1853 [in 1847–1877]: 352

Bulimus coelebs var. *ceratina* Reeve; Hanley and Theobald, 1873 [in 1870–1876]: 34, Pl. 80, Fig. 2

Buliminus (*Petraeus*) *coelebs* var *ceratina* Benson; Nevill, 1878: 134

Ena (*Mirus*) *ceratina* (Reeve); Gude, 1914a: 230

Nepaliena ceratina (Benson); Schileyko and Frank, 1994: 128

Mirus ceratina (Reeve); Ramakrishna et al., 2010: 126

Family/Subfamily Enidae, Eninae (Tribe Enini)

Material UMZC I.105080 (single shell from the R. McAndrew collection labelled "*Bulimulus* (*Ena*) *Ceratinus* Bens., Bens. col., Himalaya")

Type locality India: Almorah, Kemaon, Western Himalaya

Remarks *Nepaliena ceratina* has been identified from the Western Himalaya and from Nepal (Budha et al., 2015). Schileyko and Frank (1994) designated *ceratina* as the type species of *Nepaliena* but the shell they figure (Fig. 1, I) has a more expanded aperture than UMZC I.105080, raising doubts that the two taxa are really identical.

coelebs, *Bulimus*

Current name *Pseudonapaeus coelebs* (L. Pfeiffer, 1846)

Bulimus coelebs Benson in L. Pfeiffer, 1846: 83; Pfeiffer, 1848 [in 1847–1877]: 119; Reeve, 1848 [in 1848–1850], 5 (*Bulimus*): pl. 47, species 301; Hanley and Theobald 1873 [in 1870–1876], 34, Pl. 80, Fig. 1

Napaeus coelebs (Benson); Theobald, 1878: 145

Buliminus (*Petraeus*) *coelebs* (Benson); Nevill, 1878: 134

Buliminus (*Subzebrinus*) *coelebs* (Benson); Kobelt and Möllendorff, 1903: 47

Ena (*Subzebrinus*) *coelebs* L. Pfeiffer; Gude, 1914a: 249

Subzebrinus coelebs (L. Pfeiffer); Ramakrishna et al., 2010: 131

Family/Subfamily Enidae, Eninae (Tribe Enini)

Material UMZC I.105085 (five adult shells and one juvenile from the R. McAndrew collection labelled "*Bulimulus* (*Ena*) *Coelebs* Bens., Bens. col., Kemaon"); UMZC I.105086 (three shells rom the R. McAndrew collection labelled "*Bulimulus* (*Ena*) *Coelebs* Bens., Bens. col., Ind."); UMZC I.105087 (three shells from the R. McAndrew collection labelled "*Bulimulus* (*Ena*) *Coelebs* Bens., Bens. col., E. Ind.")

Type locality India: "Almorah, Bengaliae"

Remarks Gude (1914a: 250) noted that the BM(NH) has specimens collected by Hutton from Mussoorie (NHMUK 1856.9.15.53) and two lots from Almorah: one shell (NHMUK 1912.4.16.76, ex Beddome) and 11 specimens originally labelled *Bulimus solitarius* (NHMUK 1850.11.1.46–55)

corbis, *Unio*

Current name *Parreysia corbis* (Hanley, 1856)

Unio corbis Benson in Hanley 1856: Pl. 23, Fig. 43

Parreysia corbis; Simpson, 1900: 22: 845

Parreysia (*Parreysia*) *corbis* (Benson); Preston, 1915: 169; Subba Rao, 1989: 178; Ramakrishna and Dey, 2007: 295, Fig. 216

Family/Subfamily Unionidae, Parreysiinae (Tribe Parreysiini)
Material NHMUK 1872.10.17.3 (single specimen presented by Robert McAndrew labelled "*Unio corbis* Benson")
Type locality India: Assam
Remarks This species is attributed to Hanley (e.g. Preston, 1915; Graf and Cummings, 2007: 310). According to Ramakrishna and Dey (2007: 295) type material is present in the NHM but we have been unable to trace this. NHMUK 1872.10.17.3 was presented by McAndrew together with two other Benson bivalve species shortly after he had acquired Benson's collection.

corruscula, *Stenogyra* (*Glessula*)

Remarks Nevill (1878: 167) erroneously attributed this species to Benson, rather than Pfeiffer (1856: 35).

crassinuclea, *Succinea*

Current name *Succinea crassinuclea* (L. Pfeiffer, 1849)
[*Succinea crassiuscula* Benson 1838b: 212–213]
Succinea crassinuclea Benson in L. Pfeiffer, 1849d: 110; Gude, 1914: 453; Ramakrishna et al., 2010: 210
Succinea crassiuscula Benson; Pfeiffer, 1853 [in 1847–1877]: 9; Reeve and Sowerby, 1872 [in 1870–1872], 18 (*Succinea*): pl. 1, species 4; Hanley and Theobald, 1873 [in 1870–1876]: 30, pl. 68, figs 5, 6
Family Succineidae
Type locality "India"
Remarks The name and geographical distribution of this species were published in Hutton and Benson (1838: 212) but no description was included: "*Succinea crassiuscula*, (Benson) has also a wide range and is apparently to be met with throughout the provinces, occurring abundantly, according to Mr Benson, in the compound of the Asiatic Society's Rooms in Calcutta, extending through *Bahar* and *Allahabad* to the western frontier, and advancing to the hills as high as *Subathu*". A description was subsequently provided by Pfeiffer (1849c: 110) based on specimens from the collection of Hugh Cuming, although he appears to have mis-spelled Benson's intended name, a mistake he later attempted to correct.

crassula, *Achatina*

Current name *Glessula crassula* (Reeve, 1849)
Achatina crassula Benson MS in Reeve, 1849 [1848–1850], 5 (*Achatina*): pl. 22, species 120; Pfeiffer, 1853 [in 1847–1877]: 496; Benson, 1860h: 463
Achatina (*Electra*) *crassula* Benson MS in Reeve; Hanley and Theobald, 1870 [in 1870–1876], 17, Pl. 36, Fig. 4
Stenogyra (*Glessula*) *crassula* (Benson); Nevill, 1878: 169
Glessula crassula (Reeve); Pilsbry, 1909 [in 1908–1910]: 98, Pl. 13, Fig. 4; Gude, 1914a: 429; Ramakrishna et al., 2010: 157
Family/Subfamily Achatinidae, Glessulinae
Material NHMUK 1946.10.16.38–40 (three shells from the R. McAndrew collection, presented by the UMZC, labelled "*Glessula crassula* Bens., Himalayas, Benson Coll.")
Type locality India: "Hab. Himalaya" [later recorded as coming from "Darjiling" (Benson, 1860h)]
Remarks The number of specimens provided by William Theobald was not noted in Benson's original description, but he later alluded to "the type" (Benson, 1860h), suggesting that there might only have been one. The specimen figured by Reeve came from "Mus. Benson". This species occurs in India where it has been identified from Arunachal Pradesh, Mehhalaya, Mizoram, Nagaland and West Bengal (Ramakrishna et al., 2010).

cymatium, *Helix*

Current name *Hemiplecta cymatium* (L. Pfeiffer, 1856)
Helix cymatium Benson in L. Pfeiffer, 1856 [in 1854–1869]: 58, pl. 17 figs 1–2
Rhysota cymatium (Benson); Stoliczka, 1873: 11, pl. I, figs 1–3, pl. II, figs 13–15
Nanina (*Hemiplecta*) *cymatium* (Benson); Nevill, 1878: 47; Tryon, 1886: 42, Pl. 14, Fig. 89
Hemiplecta cymatium (L. Pfeiffer); Maassen, 2001: 101
Family/Subfamily Ariophantidae, Ariophantinae
Material UMZC I.104350 (three shells from the R. McAndrew collection labelled "*Hemiplecta Cymatium* Benson, India", no collection data); UMZC I.104345 (single shell from the R. McAndrew collection, no locality or collection data)
Type locality Malaysia: "Habitat Pulo Lancavi peninsulae Malaccanae (Cantor)" [lives on Pulo Lancavi, Malay peninsular (Cantor)]
Remarks The number of specimens provided by Theodore Cantor was not noted in Benson's original description. Neither of the UMZC lots are labelled as coming from the Benson collection, although this is likely. This species has been attributed to both Pfeiffer and Benson, but the first description was provided by Pfeiffer and the name should therefore be correctly attributed to him.

emarginatus, *Modiola*

Current name *Brachidontes striatulus* (Hanley, 1843)
Modiola emaginatus Benson MS in Reeve, 1858 [in 1856–1858], 10 (*Modiola*): Pl. 10, species 60, Fig. 73
Family Mytilidae

Material UMZC I.105090.A–B (two specimens, one articulated and the other disarticulated)
Type locality Not specified
Remarks Theobald (1860: 124) listed further specimens of "*Modiola emarginata* Benson" from "Tolly's Nulla, Calcutta" in the Museum of the Asiatic Society. This species is now regarded as a synonym of *Brachidontes striatulus* (Hanley, 1843).

eremita, *Bulimus*

Current name *Pseudonapaeus eremitus* (Reeve, 1849)
Bulimus eremita Benson MS in Reeve 1849 [1848–1850], 5 (*Bulimus*): pl. 178, species 573; Pfeiffer, 1853 [in 1847–1877]: 356; Hanley and Theobald, 1870 [in 1870–1876]: 12, Pl. 23, Fig. 6
Pupa spelaea Hutton, 1849: 653
Buliminus (*Petraeus*) *eremita* (Benson); Nevill, 1878: 134
Buliminus (*Subzebrinus*) *eremita* (Benson); Kobelt and Möllendorff, 1903: 48
Ena (*Subzebrinus*) *eremita* (Reeve); Gude, 1914a: 247
Subzebrinus eremitus (Benson); Solem, 1979: 28; Ramakrishna et al., 2010: 132
Laevozebrinus eremita (Benson); Schileyko and Frank, 1994: 130
Family/Subfamily Enidae, Eninae (Tribe Enini)
Material UMZC I.105155.A–C (three shells from the R. McAndrew collection labelled "Afghanistan, Bens. col."); UMZC I.105160 (single shell labelled "*Bulimulus* (*Petraeus*) *Spelaeus* Hutton = *Eremita* Bens", no locality data)
Type locality Afghanistan: "march … from the Bolun (= Bolan) Pass to Cabul (= Kabul), Afghanistan

exulata, *Achatina*

Current name *Chilonopsis exulatus* (Reeve, 1849)
Achatina exulata Benson MS in Reeve, 1849 [in 1848–1850], 5 (*Achatina*): Pl. 21, species 77; (*Bulimus* Fig. 572)
Bulimus exulatus; Wollaston, 1878: 542
Chilonopsis exulatus ('Benson', Reeve); Crowley and Pain, 1977: 559
Family/Subfamily Achatinidae, Coeliaxinae
Material UMZC I.105095 (single shell labelled "*Pseudachatina Exulata* Bens." from "St Helena")
Type locality "St. Helena; Lieut. Lefroy"
Remarks The entry for this species in Reeve (1849) is confusing since it is listed under both *Achatina* and *Bulimus* and the image and description appear in different places. The notes accompanying Reeve's Fig. 572 state that the specimen came from "Mus. Benson". This is an endemic species from St Helena, now extinct.

fraseri, *Tornatellina*

Current name *Ferussacia carnea* (Risso, 1826)
Tornatellina fraseri Benson MS in L. Pfeiffer, 1853: 526
Family Ferussaciidae
Material UMZC I.104095 (single shell from the R. McAndrew collection labelled "North Africa")
Type locality Tunisia: "Habitat Tunis Africae borealis (Fraser)" [Tunis, North Africa]
Remarks Pfeiffer (1853: 526) stated that the specimen is in "Mus. Benson". The number of specimens was not noted in the original description. Pilsbry (1908 [in 1907–1908]: 248–249) listed this species in the synonymy of *Ferussacia carnea*.

gangetica, *Auricula*

Current name *Ellobium gangeticum* (L. Pfeiffer, 1855)
Auricula gangetica Benson MSS in L. Pfeiffer, 1855b: 7; Pfeiffer, 1856: 135
Auricula gangetica Benson; Nevill, 1878: 226
Family/Subfamily Ellobiidae, Ellobiinae
Material UMZC I.103990 (single shell from the R. McAndrew collection labelled "Mth of Hooghly")
Type locality India: "Habitat prope Calcutta, Hoogly River"
Remarks This species is attributed to Pfeiffer (1855b), who stated that the specimens (number not specified) were in the "Coll. Benson". Nevill (1878: 226) also mentioned a "var. fustis, Bens.".

gemma, *Achatina*

Current name *Glessula gemma* (Reeve, 1849)
Achatina gemma Benson MS in Reeve, 1849 [1848–1850], 5 (*Achatina*): pl. 22, species 123; Pfeiffer, 1853 [in 1847–1877]: 496
Oleacina (*Electra*) *gemma* (Reeve); Adams, 1855: 105
Achatina (*Electra*) *gemma* Reeve; Hanley and Theobald, 1870 [in 1870–1876]: 17, Pl. 36, Fig. 7
Stenogyra (*Glessula*) *gemma* (Benson); Nevill, 1878: 170
Glessula gemma (Reeve); Pilsbry, 1909: 97, pl. 13, figs 1, 3; Gude, 1914a: 428; Ramakrishna et al., 2010: 160; Raheem et al., 2014: 124, Figs 79C–D
Family/Subfamily Achatinidae, Glessulinae
Material UMZC I.102425 (seven shells from the R. McAndrew collection labelled "*Oleacina* (*Electra*) *Gemma* Bens., Bens. col.", no locality data); NHMUK 1946.10.16.45–53 (nine shells presented by the UMZC, labelled "*Achatina gemma* Bens., Type?, Benson Coll."; the lot includes one specimen that belongs to another species (see Raheem et al., 2014 for details); NHMUK 1954.6.2.179–183 (four shells from the J.S. Hawkins collection labelled "*Achatina gemma* Benson, ?Paratypes, Bengal, W.H. Benson, April 1862")

Type locality India: "Hab. ad Barrackpore, Bengal; Benson, Bacon"
Remarks According to Reeve (1849: species 123) the specimens are in the "Mus. Benson". Raheem et al. (2014) illustrated two shells from the NHM collection (NHMUK 1946.10.16.45 and NHMUK 1946.10.16.46), which had been transferred from the UMZC. The number of specimens was not noted in the original description and it is not clear whether Reeve based his description on a single specimen or several shells. *Achatina gemma* is the type species of *Glessula* E. von Martens, 1860.

glauca, *Helix*

Current name *Tanychlamys glauca* (L. Pfeiffer, 1846)
Helix glauca (*Nanina*) Bens.? in L. Pfeiffer 1846 [in 1841–1846]: 65
Helix glauca (Benson); Hanley and Theobald, 1873 [in 1870–1876]: 28, Pl. 63, Fig. 10
Nanina (*Macrochlamys*) *glauca* (Benson); Nevill, 1878: 25; Tryon, 1886: 88, pl. 29, figs 31, 32
Macrochlamys glauca Benson MS in L. Pfeiffer, 1846; Blanford and Godwin-Austen, 1908: 80; Ramakrishna et al., 2010: 268
Family/Subfamily Ariophantidae, Tanychlamydinae
Material UMZC I.105100 (four shells from the R. McAndrew collection labelled "*Nanina Glauca* Benson", no locality data
Type locality India: "Almorah, Bengaliae"
Remarks This species has been identified from other sites in the Western Himalaya including Naini Tal, Mussooree, and Kotgarh near Simla (Blanford and Godwin-Austen, 1908: 80). Nevill (1878: 25) listed four specimens in the Indian Museum labelled "Mussooree; ex c. As. Soc. Bengal". This species exhibits similar behaviour to *Limax*, often suspending itself from a long thread of mucous.

globosum, *Cyclostoma*

Current name *Omphalotropis* (*Eurytropis*) *globosa* (L. Pfeiffer, 1852)
Cyclostoma globosum Benson MS in L. Pfeiffer, 1854c: 151; Pfeiffer, 1854 [in 1843–1854], 1(19): 296, pl. 39, figs 14–16
Hydrocena globosa (Benson); Pfeiffer, 1858: 164
Omphalotropis (*Eurytropis*) *globosa* (Benson); Kobelt and Möllendorff, 1898: 149; Germain, 1921: 285; Griffiths and Florens, 2006: 61
Family/Subfamily Assimineidae, Garrettiinae
Material UMZC I.104020 (four shells from the R. McAndrew collection labelled "*Omphalotropis Globosa* Bens., Bens. col., Mauritius"); UMZC I.105105 (three shells from the R. McAndrew collection labelled "*Omphalotropis Globosa*. Bens. col., Mauritius")
Type locality Mauritius
Remarks The number of specimens was not noted in the original description. Blanford (1869b) provided details of the anatomy of this species. This Mascarene endemic is moderately common on Mauritius but rare on Reunion. It occurs in primary forests, in gardens in Curepipe and on moss-coverted seepage areas (Griffiths and Florens, 2006: 61).

griffithsii, *Bulimus*

Current name *Pseudonapaeus griffithsii* (Reeve, 1848)
Bulimus griffithsii Benson in Reeve 1848 [in 1848–1850]: 5, (*Bulimus*): pl. 47, species 302
Buliminus (*Subzebrinus*) *griffithi* (Benson); Kobelt and Möllendorff, 1903: 48
Subzebrinus griffithii [sic] Reeve f. *minor* Hesse, 1933: 213–214
Subzebrinus griffithsii (Benson); Solem, 1979: 36
Family/Subfamily Enidae, Eninae (Tribe Enini)
Material UMZC I.105230 (single shell from the R. McAndrew collection labelled "*Bulimulus* (*Petraeus*) *Griffithi* Bens., Bens. col., Afghanistan")
Type locality "Afghanistan, India"
Remarks Reeve figured a specimen collected by Griffith from "Mus. Benson". UMZC I.105230 resembles this shell and is likely to be the holotype.

hepatizon, *Tanychlamys*

Remarks Godwin-Austen (1888 [in 1882–1888]: 209) described this species from various sites in India, noting its similarity to *T. consepta* (Benson) from Burma. However, Ramakrishna et al. (2010: 270) mistakenly attributed this species to Benson, apparently transposing the entry for *T. decussata* (Benson), which appears on the same page in Blanford and Godwin-Austen (1908: 102) and which also has the same incorrect page reference (i.e. *Journal of the Asiatic Society of Bengal* **5**: 330, rather than p. 350).

huttoni, *Planobis*

Current name *Gyraulus huttoni* (Clessin, 1884)
Planorbis (*Gyraulus*) *huttoni* (Benson, MS), Clessin, 1884 [in 1882–1884]: 139, Pl. 18, Fig. 4; Preston, 1915: 120
Family/Subfamily Planorbidae, Planorbinae (Tribe Planorbini)
Material UMZC I.105110 (six shells from the R. McAndrew collection labelled "*Planorbis Huttoni* Bens. (type), Bens. col." [*Gyraulus* subsequently added in pencil in other handwriting], no locality data)
Type locality India: Calcutta, Benares

indica, *Macrochlamys*

Current name *Tanychlamys indica* Godwin-Austen, 1883
Macrochlamys indica Benson in Godwin-Austen, 1883 [in 1882–1888]: 97, Pl. 18, Figs 1–8b, Pl. 21, Fig. 1, Pl. 25, Figs 9–10; Blanford and Godwin-Austen, 1908: 95, Fig. 43 [anatomy]
Family/Subfamily Ariophantidae, Tanychlamydinae
Material NHMUK 1903.07.01.2351/1 (lectotype designated by Raheem and Naggs (Raheem et al., 2014: 104–105, Fig. 66C) labelled "Calcutta (GA)"); NHMUK 1903.07.01.2351/2–3 (two paralectotypes from the same lot)
Type locality India: Calcutta
Remarks The name *Macrochlamys indicus* was introduced but not made available (see ICZN, 1999, Articles 10–12) by Benson (1832: 13, 76). Nevill (1878: 21) considered Benson's species to be partly synonymous with *M. petrosa* Hutton. Godwin-Austen (1883 [in 1882–1888]: 97) considered his *Macrochlamys indica* Benson in Godwin-Austen 1883, described from preserved material in his own collection, to be the same species referred to by Benson in 1832 as *Macrochlamys indicus*, but he was subsequently not so certain about this (Blanford and Godwin-Austen, 1908: 95). The current generic concept of *Macrochlamys* dates from Godwin-Austen (1883 [in 1882–1888]: 76–92, 97–122) who denoted *Macrochlamys indica* Benson in Godwin-Austen 1883 as the type species (for further details see Raheem et al., 2014: 151–152). This species is native to South Asia (i.e. NE India, Nepal, Bhutan and Bangladesh) and has probably been introduced to the Andaman Islands and Sri Lanka (Ramakrishna et al., 2010; Raheem et al., 2014; Budha et al., 2015; Gittenberger et al., 2017a). See also *Tanychlamys indica* on p. 243.

involutus, *Unio*

Current name *Radiatula involuta* (Hanley, 1856)
Unio involutus Benson in Hanley 1856 [in 1842–1856]: 385, Pl. 23, Fig. 19
Nodularia (*Nodularia*) *involuta* (Benson); Simpson, 1900: 817; Preston, 1915: 146
Parreysia (*Radiatula*) *involuta* (Benson); Subba Rao, 1989: 189; Ramakrishna and Dey, 2007: 319, Fig. 240
Family/Subfamily Unionidae, Parreysiinae
Type locality India: Assam
Remarks Benson did not provide a description of this species, which is consequently attributed to Hanley. According to Ramakrishna and Dey, 2007: 319) type material is present in the NHM. *Radiatula involuta* has been identified from the Brahmaputra drainage in two states in northeastern India and in Bangladesh (Subba Rao, 1989).

jerdoni, *Achatina*

Current name *Glessula jerdoni* (Reeve, 1850)
Achatina jerdoni Benson MS in Reeve, 1850 [in 1848–1850], 5 (*Achatina*): pl. 21, species 80; Pfeiffer, 1853 [in 1847–1877]: 494
Achatina (*Electra*) *jerdoni* (Reeve); Hanley and Theobald, 1873 [in 1870–1876], 34, Pl. 78, Fig. 10
Stenogyra (*Glessula*) *jerdoni* (Benson); Nevill, 1878: 168
Glessula jerdoni (Reeve); Gude, 1914a: 418; Ramakrishna et al., 2010: 163; Raheem et al., 2014: 126, Fig. 80D
Family/Subfamily Achatinidae, Glessulinae
Material NHMUK 1946.10.16.8–12 (four shells from the R. McAndrew collection, presented by the UMZC, labelled "*Glessula jerdoni*, Nilgherries, Benson coll.", no locality data)
Type locality India: "Hab. Nilgherries, Hindoostan; Jerdon" [Nilgiri Hills, Hindoostan; Jerdon]
Remarks The number of specimens provided by Thomas Jerdon was not noted in the original description but the specimen figured by Reeve came from "Mus. Benson" (see also Raheem et al., 2014: Fig. 80D). This species is endemic to India, where it occurs in the southern (Palni and Anaimalai Hills) and central (Nilgiri Hills) parts of the Western Ghats, and in Cherrapunji in Meghalaya (Raheem et al., 2014).

jerdoni, *Bulimus*

Current name *Cerastua jerdoni* (Reeve, 1848)
Bulimus jerdoni Benson MS in Reeve 1848 [in 1848–1850], 5 (*Bulimus*): pl. 46, species 297; Pfeiffer, 1853 [in 1847–1877]: 335
Buliminus (*Cerastus*) *jerdoni* (Benson); Nevill, 1878: 132
Cerastus (*Cerastus*) *jerdoni* (Benson); Kobelt and Möllendorff, 1903: 40
Cerastus jerdoni (Reeve); Gude, 1914a: 265; Raheem et al., 2014: 67
Cerastua jerdoni (Reeve); Ramakrishna et al., 2010: 137
Family Cerastidae
Material UMZC I.105115 (single shell from the R. McAndrew collection labelled "*Bulimus* [*jerdoni* added in pencil], Ahmednugger – Ind."); UMZC I.105116) (single shell from the R. McAndrew collection labelled "*Bulimus* [*jerdoni* added in pencil], Ahmednugger – Ind."); UMZC I.105117 (four shells from the R. McAndrew collection labelled "*Bulimulus Redfieldi* Pfr (= *jerdoni* Var. Bens), Bens. col., Ahmednugger")
Type locality India: "Deccan, Hindostan"
Remarks *Bulimus redfieldi*, the name applied to one of the lots above, was originally described as a distinct species by Pfeiffer (1854c: 66), but subsequently downgraded to a variety of *Bulimus jerdoni* (Gude, 1914a: 266). This species is endemic to India, where it

has been identified from the Deccan and Pune in the northern Western Ghats (Raheem et al., 2014: 67).

jugicostis, *Melania*

Current name *Melanoides jugicostis* (Hanley & Theobald, 1874)
Tiara (*Melanoides*) *jugicostis* Benson MS in Hanley and Theobald, 1874 [in 1870–1876]: 45, Pl. 110, Figs 8, 9; Preston, 1915: 28–29, Fig. 1
Melanoides jugicostis (Hanley & Theobald); Brandt, 1974: 166
Family Thiaridae
Type locality Tenasserim River
Remarks This taxon should be attributed to Hanley and Theobald (1974), who first used the name validly with an illustration. Preston (1915) also published a drawing of a type specimen.

kraussi, *Achatina*

Current name *Cochlitoma zebra* var *kraussi* (Reeve, 1842)
Achatina kransii Reeve, 1842: 55
Achatina krausii Reeve, 1849 [in 1848–1850], 5 (*Achatina*): pl. 6, species 21 (ex Benson coll.)
Achatina zebra var *kraussi* Reeve, 1849; Connolly, 1939: 300
Family/Subfamily Achatinidae, Achatininae
Type locality South Africa: "Hab. Port Natal, Coast of Africa"
Remarks The number of specimens was not noted in the original description. Connolly (1939) noted that both Reeve's original name (*kransii*) and its locality (Port Natal) are incorrect, stating that it was only then known from Coega R., Algoa Bay, where it had been found by Krauss. As *kraussi* is the only spelling in use, it can be retained under ICZN Art. 33.3.1 (Petit, 2009: 55). Mead (2004) has re-examined the generic placements of the Achatinidae, concluding that this species belongs in *Cochlitoma* A. Férussac, 1821.

latebricola, *Bulimus*

Current name *Opeas latebricola* (Reeve)
Bulimus latebricola Benson MS in Reeve 1849 [in 1848–1850], 5 (*Bulimus*): pl. 80, species 572; Pfeiffer, 1853 [in 1847–1877]: 401; Hanley and Theobald, 1873 [in 1870–1876]: 34, Pl. 79, Fig. 7
Stenogyra latebricola (Reeve); Nevill, 1878: 174
Opeas latebricola (Reeve); Pilsbry, 1906: 162, pl. 19, figs 20, 23; Gude, 1914a: 358
Family/Subfamily Coeliaxidae, Opeatinae
Material UMZC I.105120 (two shells from the R. McAndrew collection labelled "*Oleacina Latebricola* Bens?, Bens col.", no locality data); UMZC I.105121 (two shells from the R. McAndrew collection labelled "*Subulina* (*Opeas*) *Latebricola* Bens., Bens. col., Landour")
Type locality India: Landour, Western Himalaya
Remarks This species was "obtained by Mr Benson in the lower Himalaya range, at elevations varying from 4,000 to 7,000 feet" (Reeve 1849, pl. 80, species 572). Gude (1914a: 359) mentioned that the BM(NH) has five specimens (NHMUK 1879.12.26.105–109) labelled "*Bulimus* (*Hapalus*) *latebricola* Bens., Landour, transferred from the India Museum". These were smooth and polished and very finely striated and differed in a number of characters, not least in their smaller size, to the specimen figured by Reeve.

melanostoma, *Paludina*

Current name *Bellamya dissimilis* (O.F. Müller, 1774)
Paludina melanostoma Benson MS in Reeve, 1863 [in 1862–1864], 14 (*Paludina*): pl. 5, species 27
Material Five probable syntypes (NHMUK 20160455) from "Bengal-Ganges" (Mus. Cuming)
Remarks A synonym of *Bellamya dissimilis* (O.F. Müller, 1774)

modicus, *Planorbis*

Planorbis modicus Benson; Adams, 1858 [in 1853–1858]: 261; Reeve and Sowerby, 1877 [in 1875–1878], 20 (*Planorbis*): pl. 9, species 76; Preston, 1915: 117
Family Planorbidae
Type locality India

monticola, *Vitrina*

Current name *Euaustenia monticola* (L. Pfeiffer, 1849)
Vitrina monticola Benson MS in L. Pfeiffer, 1849b: 107
Vitrina scutella Benson, 1859e: 188
Macrochlamys (*Euaustenia*) *monticola* (Pfeiffer); Ramakrishna et al., 2010: 290
Material UMZC I.104485 (six shells from the R. McAndrew collection labelled "Landour"); UMZC I.104490 (two shells labelled "Hills of Deyrah"); UMZC I.104495 (two shells from the R. McAndrew collection); NHMUK 1856.9.15.29 (eight shells from the Thomas Hutton collection labelled "Mussorie")
Type locality India: "Bengal, Landour, Himalayah, Almorah"
Family/Subfamily Ariophantidae, Tanychlamydinae
Remarks Some or all of the type specimens must be in the Cuming Collection (see Pfeiffer, 1848). UMZC I.104485 and UMZC I.104495 are in the McAndrew Collection but may not be from the Benson Collection, although the former lot is from one of the given type localities.

nanus*, *Planorbis

Current name *Gyraulus nanus* (Sowerby in Reeve & Sowerby, 1877)
Planorbis nanus Benson, 1836b: 743 (*nomen nudum*)
Planorbis (*Gyraulus*) *nanus* Reeve and Sowerby, 1877: 20 (*Planorbis*), pl. 9, species 75; Preston, 1915: 122
Gyraulus nanus (Benson); Germain, 1921–1924: 131, pl. ii, figs 10–12
Family/Subfamily Planorbidae, Planorbinae (Tribe Planorbini)
Type locality Tsoral Lake, Tibet
Remarks Benson's name of 1836 is invalid and the authorship of *P. nanus* should be attributed to Sowerby. Benson identified fossils of this species from Tsoral Lake, Tibet, which were reported by Woodward (1856b).

nilagarica*, *Achatina

Current name *Glessula nilagirica* (Reeve, 1850)
Achatina nilagarica Benson MS in Reeve, 1850 [in 1848–1850], 5 (*Achatina*): pl. 21, species 87
Achatina perrotteti var *nilagirica*; Pfeiffer, 1853 [in 1847–1877]: 494
Achatina (*Electra*) *perrotteti*; Hanley and Theobald, 1870 [in 1870–1876]: 17, Pl. 35, Fig. 6 (non Pfeiffer)
Glessula nilagirica (Reeve); Pilsbry, 1909 [in 1908–1909]: 90, pl. 9, Fig. 5; Gude, 1914a: 382; Ramakrishna et al., 2010: 167; Raheem et al., 2014: 127, Figs 81D–E
Family/Subfamily Achatinidae, Glessulinae
Material NHMUK 1946.10.16.58 (lectotype designated by Raheem and Naggs (Raheem et al., 2014: Fig. 81D) labelled X); NHMUK 1946.10.16.59–60 (two paralectotypes from the same lot)
Type locality India: "Hab. Nilgherries, Hindoostan; Jerdon" [Nilgiri Hills, Hindoostan; Jerdon]
Remarks The number of specimens was not noted in the original description but the specimen figured by Reeve came from "Mus. Benson". Reeve (1850) spelt the species name "*nilagarica*" but since Pfeiffer's (1853) emendation *nilagirica* (attributed to Reeve and Benson) was the more widely used name, Gude opted for this spelling, which is consistent with Art. 33.2.3.1 of the ICZN Code. This species is endemic to the Western Ghats, where it has been identified from the Nilgiri Hills (Raheem et al., 2014).

nivicola*, *Bulimus

Current name *Pseudonapaeus nivicola* (Reeve, 1849)
Bulimus nivicola Benson MS in Reeve, 1849 [in 1848–1850], 5 (*Bulimus*): Pl. 69, species 496; Hanley and Theobald, 1870 [in 1870–1876]: 11, Pl. 22, Fig. 9
Ena (*Subzebrinus*) *nivicola* (Reeve); Gude, 1914a: 240, Fig. 90
Subzebrinus nivicola (Reeve); Ramakrishna et al., 2010: 133
Family/Subfamily Enidae, Eninae (Tribe Enini)
Material UMZC I.105125 (single shell from the R. McAndrew collection labelled "*Bulimulus* (*Ena*) *Nivicola* Bens., Bens. col., Himalayas"); UMZC I.105126 (two shells from the R. McAndrew collection labelled "*Bulimulus* (*Ena*) *Arcuatus* Hutton = *nivicola* Bens., Bens. col., Himalaya")
Type locality India: "Liti Pass, Western Himalaya"
Remarks This species was found among juniper bushes and patches of snow at nearly 14,000 feet at the Burrenda Pass. Benson considered *Bulimus nivicola* to be synonymous with "*Pupa sylvatica* Hutton", see Gude (1914a: 240) for a full discussion. Gude (1914a: 241) also noted that the BM(NH) had six specimens collected by Hutton from "Snowy Range" (NHMUK 1856.9.14.6)

obesa*, *Gibbulina

Current name ?*Gonospira modiola* (Férussac, 1821)
Gibbulina (*Gonospira*) *obesa* 'Benson', Kobelt, 1904a: 334, no 26, taf XL, figs 13–14
Orthogibbus (*Orthogibbus*) *obesus* (Benson) Kobelt, 1904a; Germain, 1921: 43
Family/Subfamily Streptaxidae, Enneinae
Remarks This species is likely to be a synonym of *Gonospira modiola* (A. Férussac, 1821) (O. Griffiths, *pers. comm*.).

obtusa*, *Neritina

Current name *Neripteron* (*Pseudonerita*) *obtusum* (Sowerby, 1836)
Neritina obtusa Benson, 1836b: 749 (*nomen nudum*); Benson in Sowerby, 1836 [in 1832–1841], 98, Fig. 43; *Thes. Conch*. ii: 517, pl. 111, figs 72–73; Tryon, 1888b: 43, Pl. 14, Figs 82, 83
Theodoxis obtusa (Benson); Preston, 1915: 6
Family Neritidae
Type locality India: "waters around Calcutta"
Remarks According to Eichhorst (2016a: 371) this species should now be called *Neripteron* (*Pseudonerita*) *obtusum* (Sowerby, 1836) since Sowerby provided the first valid description. Preston (1915) recorded it from the banks of the Ganges at Calcutta and it has also been recorded from Bangladesh but is likely to have a wide distribution within the known range.

occidens, *Corbicula*

Current name *Corbicula occidens* Deshayes, 1855
Corbicula occidens Benson; Deshayes, 1855: 223; Hanley, 1863: Pl. 6, Fig. 5; Hanley and Theobald, 1875 [in 1870–1876], 55, Pl. 138, Figs 8, 9; Theobald, 1878: 147
Family Cyrenidae
Type locality India: Bareilly, Bengal (locality of lectotype); Deshayes mentioned Sikkim, Moredabad, Bengal
Remarks Deshayes tentatively referred this name to Benson but this species should be attributed to Deshayes, who provided the first description (Deshayes, 1855: 223). A "co-type" of this species labelled "Bareilly, Bengal, India" was sent to Temple Prime by Hugh Cuming and is now in the MCZH. Prime (1866: 220, Fig. 51) subsequently figured this specimen (MCZH 187449), which was selected as the lectotype by Johnson (1959: 463). The genus *Corbicula* is in urgent need of revision.

orcula, *Bithynia*

Current name *Bithynia* (*Gabbia*) *orcula* Frauenfeld, 1862
Bithynia orcula Benson MS in Frauenfeld, 1862; Preston, 1915: 74; Hanley and Theobald, 1870 [in 1870–1876]: 18, pl. 38, figs 8, 9 (as *Bythinia*); Nevill, 1885: 36 (as *Bythinia*)
Amnicola (*Alcocimna*) *orcula* (Frauenfeld); Annandale, 1920a: 42
Bithynia (*Gabbia*) *orcula* Frauenfeld; Glöer and Bössneck, 2013: 141
Family Bithyniidae
Material UMZC I.103395 (ten shells originally, two now missing), UMZC I.103400 (twenty-three shells from "Ind."); NHMUK 1954.6.2.714–719 (six shells from the J.S. Hawkins collection labelled "*Bithinea orcula* Benson, ?Paratypes")
Type locality India and Sri Lanka: "In Cuming's Sammlung von Ganges, Ranewalla, Ceylon, Barrakpore" [In Cuming's collection from the Ganges, Ranewalla, Ceylon, Barrakpore"]
Remarks This species should be attributed to Frauenfeld, who provided the first description. The status of the UMZC specimens is unclear since they cannot be linked to Benson or Frauenfeld. The Hawkins collection specimens in the NHM were part of a collection from Moulmein provided by Col. Robert Gordon (MSS_ZOO_HAW) and are not part of the type series. The Natural History Museum in Vienna has two lots of syntypes labelled by Frauenfeld (Glöer and Bössneck, 2013). According to the database of the MCZH, this institution also has "paratypes" of this species "Ex. Benson" (MCZH 104571), but the status of these specimens requires checking because to qualify as paratypes they must have a direct link to Cuming. Glöer and Bössneck (2013: 147) provided an identification key to the bithyniids of Nepal, which included *orcula*. This species is widely distributed in India and Nepal (Ramakrishna and Dey, 2007).

oreas, *Achatina*

Current name *Glessula oreas* (Reeve, 1850)
Achatina oreas Benson MS in Reeve, 1850 [in 1848–1850]: pl. 22, species 113; Benson, 1860h: 464
Achatina (*Electra*) *oreas* Reeve; Hanley and Theobald, 1873 [in 1870–1876]: 33, Pl. 78, Fig. 9
Stenogyra (*Glessula*) *oreas* (Benson); Nevill, 1878: 168
Glessula oreas (Reeve); Pilsbry, 1909 [in 1908–1910]: 80, Pl. 10, Fig. 11; Gude, 1914a: 424; Ramakrishna et al., 2010: 168; Raheem et al., 2014: 128, Fig. 82B
Family/Subfamily Achatinidae, Glessulinae
Material UMZC I.102450 (four shells from the R. McAndrew collection labelled "*Oleacina* (*Electra*) *oreas* Benson, Nilgherries"); NHMUK 1946.10.16.21–3 (three shells presented by the UMZC labelled "*Glessula oreas*, Nilgerries, Benson coll.")
Type locality India: "Hab. Nilgherries, Hindoostan; Jerdon" [Nilgiri Hills, Hindoostan; Jerdon]
Remarks Reeve (1849: species 113) listed this species as "Mus. Benson" from "Benson, MS".
Raheem et al. (2014) illustrated the largest of the three shells at the NHM but noted that none of them corresponded closely with Reeve's figure in shape and dimensions; they were all much smaller.

orophila, *Achatina*

Current name *Glessula orophila* (Reeve, 1849)
Achatina orophila Benson MS in Reeve, 1849 [in 1848–1850], 5 (*Achatina*): pl. 19, species 105; Pfeiffer, 1853 [in 1847–1877]: 493 (as a synonym of *A. ceylanica* L. Pfeiffer)
Glessula orophila (Reeve); Pilsbry, 1909 [in 1908–1910]: 79, Pl. 10, Fig. 10; Gude, 1914a: 423; Ramakrishna et al., 2010: 169; Raheem et al., 2014: 128
Family/Subfamily Achatinidae, Glessulinae
Type locality Sri Lanka: "Neilgherry Hills, India … Colombo, Ceylon …"
Remarks Two localities were provided by Reeve but it is not known from which the described shells were obtained. The shell illustrated by Reeve came from the Cuming collection but neither this nor any other authentic Reeve material could be traced (see also discussion in Godwin-Austen, 1920: 4–5). Because of these uncertainties Raheem et al. (2014) considered *G. orophila* a *nomen dubium*.

parma, *Unio*

Current name *Parreysia tavoyensis* (Gould, 1843)
Unio parma Benson in Sowerby, 1868 [in Reeve, 1864–1868], 16 (*Unio*): pl. 95, species 514
Family/Subfamily Unionidae, Parreysiinae (Tribe Parreysiini)
Material NHMUK 1888.12.4.1669 (two valves from the W. Theobald collection labelled "Bensonian type and locality fide W.T., Tenasserim"); NHMUK 1907.12.30.48 (disarticulated syntype presented by H. Harvey labelled "Figd. In *Conch. Icon.* F. 514, from Hanley Coll., Tenasserim, Burma")
Type locality Burma: Tenasserim

polynema, *Cyclophorus*

Remarks Nevill (1878: 272) erroneously attributed this species to Benson, rather than Pfeiffer (1854: 126).

proletarius, *Buliminus* (*Petraeus*)

Remarks Nevill (1878: 135) erroneously attributed this species to Benson, rather than Pfeiffer (1854: 292).

radula, *Unio*

Current name *Radiatula lima* (Simpson, 1900)
Unio radula Benson MS in Hanley, 1856: 382, Pl. 23, Fig. 41 (non Say, 1829)
Nodularia (*Radiatula*) *lima* Simpson, 1900; Preston, 1915: 147
Family/Subfamily Unionidae, Parreysiinae
Material UMZC I.105130 (single shell from the R. McAndrew collection labelled "*Unio (Quadrula) radula* Bens. (unique), Assam")
Type locality India: "Assam"
Remarks A pencil inscription inside the left valve, apparently in McAndrew's writing reads "*U. scobina*" but this has been crossed out. The number of specimens examined was not noted in the original description. The UMZC specimen closely matches the figure in Hanley (1856: Pl. 23, Fig. 41), including the pattern of wear around the umbone. However, there is a little more wear to the valves than shown in the figure. It is probable that the figure was part reconstruction and not quite true to life.

rariplicata, *Helix*

Helix rariplicata Pfeiffer, 1849a: 71; Benson, 1850b: 254; Reeve, 1853 [in 1851–1854], 7 (Helix): Pl. 174, species 1183
Trachycystis rariplicata (L. Pfeiffer); Connolly 1939: 204
Material UMZC I.105255 (six shells from the R. McAndrew collection labelled "*Discus rariplicatus* Bens., Bens. col., Cape G. Hope"); NHMUK 1937.12.30.4748 (single shell from the Connolly collection labelled "*Trachycystis rariplicata* Benson, Cape of Good Hope" and (in different handwriting) "Grateloup coll. (Benson)". The register entry for this specimen also lists it as a "paratype" but makes no reference to either Grateloup or Benson)
Type locality South Africa: Light-House Green Point, Cape of Good Hope
Remarks This species was described by Pfeiffer (1849a) and attributed to "Benson *in litt*.". Benson published a verbatim description the following year (Benson, 1850b), which Pfeiffer listed in his later synonymy (Pfeiffer, 1853 in 1853–54). Although Benson sent numerous specimens to Pfeiffer, many of which were described and figured in the latter's publications, *Helix rariplicata* does not appear to have been amongst them. Connolly's assertion (1939: 204) that the type specimen was in the Stettin Museum, subsequently destroyed in World War II (Dance, 1986: 210, 222, but see Herbert and Mousalli, 2010: 114), therefore appears to be feasible. Despite its label, NHMUK 1937.12.30.4748 cannot be a paratype since no holotype was designated and it can only be a syntype if Grateloup received the specimen from Benson, which is uncertain; the significance of "(Benson)" on the label is unclear. It was registered by the BM(NH) as part of the Connolly collection but Connolly (1939) made no mention of it. The six specimens in the Benson collection in the UMZC are from the type locality but are not considered part of the type series as it is not clear if they were amongst the shells examined by Pfeiffer. Connolly mentioned that specimens of *T. sabuletorum* have often been erroneously referred to *rariplicata* but that he had been unable to trace any genuine specimens of it found since Benson first collected it and that "it has probably been extinguished by the march of civilization" (Connolly, 1939: 204).

regia, *Corbicula*

Current name *Corbicula regia* Clessin, 1879
Corbicula regia Benson ms, Clessin, 1879: 267: Pl. 43, Fig. 5; Preston, 1915: 221
Family Cyrenidae
Material NHMUK 1880.5.7.11–13 (three specimens donated to the NHM by the Indian Museum, labelled "*Corbicula regia* Bens, Pinang"). The source of these specimens is not clear and they cannot be directly linked to Benson
Type locality "Wahrscheinlich Indien", probably India; in error for Penang, Malaysia (Glaubrecht et al., 2007: 259)
Remarks The name was attributed to Benson by Clessin (1879) but Benson did not describe this species. Clessin, who provided the first description and

figure, therefore becomes the author of the name *C. regia*. His description was based on material from the Paetel collection in the Natural History Museum of the Humboldt University in Berlin, from which a lectotype (ZMB 170.404a) was recently designated (Glaubrecht et al., 2007: 259). There is confusion regarding the source of this material since according to Prashad (1928b), this species does not occur in India and mostly probably originates from Penang (Malaysia).

retifera, *Neritina*

Current name *Clithon reticularis* (Sowerby, 1838)
Neritina retifera Benson, 1836b: 749 (*nomen nudum*); Tryon, 1888b: 71, pl. 26, figs 88, 89
Neritina reticularis Sowerby, 1838: No 51, Fig. 44
Theodoxis reticularis (Sowerby); Preston, 1915: 6
Clithon reticularis (Sowerby); Subba Rao, 1989: 40
Theodoxus (*Clithon*) *reticularis* (Sowerby); Ramakrishna and Dey, 2007: 70
Family Neritidae
Type locality India: "waters around Calcutta"
Remarks This species generally occurs in estuarine waters and rarely extends into freshwater (Subba Rao, 1989; Ramakrishna and Dey, 2007). *Clithon reticularis* is common throughout India, and is also present in Pakistan, Bangladesh and Burma.

retifera, *Helix* (*Plectopylis* ?)

Remarks Nevill (1878:70) mistakenly attributed this species, now *Ruthvenia retifera* (L. Pfeiffer, 1845), to Benson.

rufistrigatus, *Bulimus*

Current name *Pseudonapaeus rufistrigatus* (Reeve, 1849)
Bulimus rufistrigatus Benson MS in Reeve, 1849 [in 1848–1850], 5 (*Bulimus*): pl. 78, species 570; Pfeiffer, 1853: 350; Hanley and Theobald, 1870 [in 1870–1876]: 12, Pl. 23, Fig. 10
Napaeus rufistrigatus (Benson); Theobald, 1878: 146
Buliminus (*Petraeus*) *rufistrigatus* (Benson); Nevill, 1878: 134
Buliminus (*Subzebrinus*) *rufistrigatus* (Benson); Kobelt and Möllendorff, 1903: 49
Ena (*Subzebrinus*) *rufistrigata* (Reeve); Gude, 1914b: 253
Subzebrinus rufistrigata (Reeve); Ramakrishna et al., 2010: 134
Family/Subfamily Enidae, Eninae (Tribe Enini)
Material The UMZC has two lots: the first (UMZC I.105135) consists of four shells labelled by McAndrew "*Bulimulus* (*Ena*) *Rufostrigatus* [sic] Bens., Bens. col., Punjab"; the second lot (UMZC I.105136) consists of a single shell labelled "*Bulimulus* (*Ena*) *Rufostrigatus* [sic] Var *Gracilis* Bens., Bens. col., Punjab"
Type locality India: "at the base of the lower range of the Himalaya, between the rivers Jumna and Sutlej"
Remarks Reeve (1849) noted that the original specimens were "Communicated to Mr. BENSON by Capt. HUTTON with the title *Pupa strigata*, of which the specific name is occupied in the present genus." The validity of this species is rather doubtful, and it is not easily separable from other taxa in large series (see Gude, 1914a: 254). According to Gude (1914a) *B. rufistrigatus* var. *gracilis* Benson (figured by Hanley and Theobald, 1870 [in 1870–1876], 10, pl. 20, Fig. 4) is about 11 mm in length and approaches *Serina beddomeana* (G. Nevill, 1878) but differs in having a proportionately larger body-whorl.

scutum, *Unio*

Current name *Lamellidens marginalis scutum* (Sowerby, 1868)
Unio scutum Benson in Sowerby, 1868 [in Reeve, 1864–1868], 16 (*Unio*): pl. 94, species 510; Hanley and Theobald, 1872 [in 1870–1876]: 22, Pl. 46, Fig. 1
Lamellidens scutum (Sowerby); Simpson, 1900: 857; Subba Rao, 1989: 169
Lamellidens marginalis scutum (Sowerby); Preston, 1915: 181; for a full taxonomic history see Graf and Cummings (2013)
Family/Subfamily Unionidae, Parreysiinae (Tribe Lamellidentini)
Material NHMUK 1907.10.28.239 (holotype from the S. Hanley collection labelled "Tenasserim, H. Harvey Esq.")
Type locality Burma: Tenasserim
Remarks Johnson (1956: 134) mentioned that a "paratype" (MCZ 175548) is present in the collection of the MCZH.

segregatus, *Bulimus*

Current name *Cerastua segregatus* (Reeve, 1849)
Bulimus segregatus Benson MS in Reeve, 1849 [in 1848–1850], 5 (*Bulimus*): pl. 79, species 587; Pfeiffer, 1853 [in 1847–1877]: 440; Hanley and Theobald, 1873 [in 1870–1876]: 34, Pl. 80, Fig. 10
Napaeus segregatus (Benson); Theobald, 1878: 145
Cerastus segregatus (Reeve); Gude, 1914a: 268
Cerastua segregatus (Reeve); Ramakrishna et al., 2010: 138
Family Cerastidae
Material UMZC I.105140 (three adult and one juvenile shell from the R. McAndrew collection labelled "*Bulimulus* (*Nepaeus*) *Segregatus* Bens., Bens. col., Simla")
Type locality India: "Simla, Western Himalaya"

Remarks Gude (1914a: 269) noted that the type appears to be lost but lot UMZC I.105140 came from the type locality and appears to represent the type series.

sikkimensis, Bulimus

Current name *Curvella sikkimensis* (Reeve, 1849)
Bulimus sikkimensis Reeve, 1849: pl. 87, species 651; Benson, 1860h: 464; Pfeiffer, 1853 [in 1847–1877]: 436; Hanley and Theobald, 1870 [in 1870–1876]: 10, Pl. 19, Fig. 7
Curvella sikkimensis (Reeve); Pilsbry, 1906: 66, pl. 9, figs 59, 60; Gude, 1914a: 349; Ramakrishna et al., 2010: 151
Family Achatinidae (subfamily uncertain)
Material UMZC I.104870 (single shell from the R. McAndrew collection labelled "*Spiraxis Sikkimensis* Bens., Bens. col., Darjiling"); UMZC I.104871 (single shell from the R. McAndrew collection labelled "*Bulimulus* (*Rachis*) *Sikkimensis* Rve, Bens. col.", no locality data)
Type locality India: "Darjeeling, Sikkim-Himalaya"
Remarks Reeve (1849: species 651) described this as "An interesting species from the collection of Mr. Benson…"

sincaporensis, *Melampus*

Current name *Melampus sincaporensis* L. Pfeiffer, 1855
Melampus sincaporensis Pfeiffer, 1855b: 8
Family/Subfamily Ellobiidae, Melampinae
Material UMZC I.104850 (four shells from the R. McAndrew collection labelled "*Melampus sincaporensis* Bens., Bens. col., Singapore")
Type locality Singapore: "Habitat Sincapore"
Remarks This species is attributed to Pfeiffer (1855b: 8), who described it from specimens in the "Coll. Benson."

sindicus, *Bulimus*

Current name *Pseudonapaeus sindicus* (Reeve, 1848)
Bulimus sindicus Benson MS in Reeve, 1848 [in 1848–1850] 5 (*Bulimus*): pl. 47, species 303; Pfeiffer, 1853 [in 1847–1877]: 355; Hanley and Theobald, 1870 [in 1870–1876]: 10, Pl. 20, Fig. 6
Buliminus (*Petraeus*) *sindicus* (Benson); Nevill, 1878: 134
Napaeus sindicus (Benson); Theobald, 1878: 145
Buliminus (*Subzebrinus*) *sindicus* (Benson); Kobelt and Möllendorff, 1903: 49
Ena (*Subzebrinus*) *sindica* (Reeve); Gude, 1914a: 245
Subzebrinus sindica (Reeve); Ramakrishna et al., 2010: 135
Family/Subfamily Enidae, Eninae (Tribe Enini)
Material UMZC I.105145 (four shells from the R. McAndrew collection labelled "*Bulimulus Sindicus* Bens., Bens. col., Subathoo [Subathu] in Him^{ya}")
Type locality "Near the head waters of the river Sinde, India"

strangei, *Pupa*

Current name *Velepalaina strangei* (L. Pfeiffer, 1854)
Pupa strangei Pfeiffer, 1854b: 69
Velepalaina strangei (Benson); Smith, 1992: 39; Stanisic et al., 2010: 72
Family Diplommatinidae
Type locality Gordon Island, Port Jackson, E. Australia
Remarks This species is often attributed to Benson, but he clearly stated that he believed the two Australian specimens he had obtained from Frederick Strange in July 1851 (see Benson, 1852b: 351) had been described by Pfeiffer, and therefore refrained from naming or describing it (Benson, 1853d: 286). Pfeiffer based the description of his *Pupa strangei* on specimens in Hugh Cuming's collection, which had also been obtained from Strange; however, the type locality given for Pfeiffer's description (Gordon Island, Port Jackson) differs to that of Benson's specimens (Point Danger). It is unclear why Benson then decided to describe his specimens as *Diplommatina australiae* two years later (Benson, 1855: 331), but it is possible he believed that the two species were different. According to Iredale (1937) *D. australiae* Benson, 1855 is a junior synonym of *Velepalaina strangei* (see also Smith, 1992: 39), although neither of Benson's type specimens could be located. This species has been identified from other coastal regions of New South Wales and Queensland, Australia, where it lives in leaf-litter of forest and amongst rocks (Smith, 1992; Stanisic et al., 2010).

tutulus, *Bulimus*

Current name *Pupoides* (*Pupoides*) *coenopictus* (Hutton, 1834)
Bulimus tutulus Benson MS in Reeve, 1849 [in 1848–1850] 5 (*Bulimus*): pl. 84, species 625
Pupa tutula (Reeve); Pfeiffer, 1853 [in 1847–1877]: 535; Hanley and Theobald, 1876 [in 1870–1876]: 63, Pl. 156, Fig. 6
Pupa (*Leucochila*) *tutula* (Benson); Nevill, 1878: 194
Pupoides tutulus (Reeve); Gude, 1914a: 261; Ramakrishna et al., 2010: 120
Family Pupillidae
Material The UMZC has two lots containing single shells: McAndrew labelled the first (UMZC I.105150) "*Pupa* (*Bulimus*) *Tutula* Bens., Bens. col., Bundelkhund", whereas the second specimen (UMZC

I.105151), also from Bundelkund, has been labelled by Hanley "*Pupa tutula*" and "fig[d] in *Conch Ind*."
Type locality India: "Humeerpore, Bundelkhund"
Remarks According to Reeve, only two specimens were found. It has since been recorded from Bihar, Delhi, Gujarat, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh (Ramakrishna et al., 2010). However, this species is often regarded as a synonym of *Pupoides coenopictus* T. Hutton, 1834.

trirostris, *Unio*

Current name *Radiatula caerulea* (Lea, 1831)
Unio trirostris Benson in Sowerby, 1868 [in Reeve 1864–1868], 16 (*Unio*): Pl. 65, Fig. 331
Unio trirostris Benson (not Reeve); Hanley 1863, Pl. 2, Fig. 9; Hanley and Theobald, 1870 [in 1870–1876], 6, Pl. 11, Fig. 6
Family Unionidae, Parreysiinae
Material According to Johnson (1971: 96) NHMUK 1907.2.30.45 is the figured holotype, although this specimen has no type locality. NHMUK 1907.12.30.47 is labelled "*Unio trirostris* (Benson Mss) Hanley, Fig[d] in *Conch. Ind.* pl. XI f. 6, from Hanley coll., Moradabad". Three lots (UMZC I.103599–103601) are in the UMZC: one specimen with disarticulated valves from Ranguya (?); one articulated specimen and one with disarticulated valves from Moradabad and a third lot consisting of one specimen with disarticulated valves and one isolated valve from "Ind" [India].
Type locality India
Remarks This species was originally thought to differ from "*Unio caerulea*" because of its much longer and more solid shell, it is now regarded as a form of *Radiatula caerulea* (Lea, 1831).

vesiculata, *Glandina*

Current name *Ferussacia folliculus* (Gmelin, 1791)
Spiraxis barclayi L. Pfeiffer, 1855c: 99; Pfeiffer, 1859: 580; Pfeiffer, 1868: 197
Ferussacia barclayi (Benson); Nevill, 1878: 161
Ferussacia barclayi (Pfeiffer); Germain, 1921: 203
Glandina vesiculata Benson in Semper, 1877 [in 1870–1885]: 135
Family Ferussaciidae
Type locality (of *vesiculata*) Mauritius
Remarks *Glandina vesiculata* is a synonym of *Ferussacia folliculus* (Gmelin, 1791). Nevill (1878: 161) remarked "The anatomy ... is described by Semper, (Heft III Philipp. Moll., p. 135) as a shell sent by me labelled "*Glandina vesiculata*, Bens."; this was the name under which the form was known at Mauritius, and used by me before I had access to any conchological works."

MOLLUSCAN GENUS-GROUPS DESCRIBED BY W.H. BENSON

Batillaria Benson, 1842

Type species *Cerithium zonale* Bruguière, 1792 (type by monotypy)
Family Batillariidae
Remarks Three specimens, presumably amongst those examined by Benson when erecting this genus (Benson, 1842b: 488), form NHMUK 1842.9.30.53–55, presented by the Hon. East India Company and labelled "*Batillaria zonalis*, coasts, Island of Chusan". *Batillaria* is the type genus of the Batillariidae.

Camptoceras Benson, 1843

Type species *Camptoceras terebra* Benson, 1843 (type by monotypy)
Family/Subfamily Planorbidae, Planorbinae (Tribe Camptoceratini)
Remarks The systematic placement of this genus has been problematic. Benson (1843; 1855c) thought that *Camptoceras* belonged to the "Lymnaeadae" and was allied to *Anyclus*. Dall (1870: 352) proposed the planorbid tribe Camptoceratini to accommodate it. Annandale and Prashad (1918) provided further details of its ecology and anatomy (based largely on a Japanese species) and concluded that *Camptoceras* was an ancylid rather than a succineid, which was the attribution favoured by Nevill (1878: 215) and Gude (1914: 460). In a later paper, with further material at hand, they rejected their earlier view and thought that *Camptoceras* was a planorbid, provisionally placing it in the subfamily "Bullininae" (Annandale and Prashad, 1920). Hubendick (1955) discussed relationships between *Camptoceras* and the planorbid tribes Drepanotrematini or the Plesiophysini but in a much later paper (Hubendick, 1978) he placed *Camptoceras* in a tribe with *Planorbarius* (now Coretini) and *Heliosoma* (now Helisomatini). However, Bouchet et al. (2017) maintain the Camptoceratini as a tribe within the Planorbinae, which we follow here.

Camptonyx Benson, 1858

Type species *Camptonyx theobaldi* Benson, 1858 (type by monotypy)
Superfamily Lymnaeoidea
Remarks Benson (1858) compared this genus to *Ancylus*, but Gray (1858) likened it to *Otina*, a semi-terrestrial pulmonate that inhabits the splash zone of rocky shores. Most authorities (e.g. Rao, 1924) include *Camptonyx* with the Succineidae but *Camptonyx* has triangular tentacles with eyes at their base, clearly demonstrating that it cannot be a stylommatophoran

(see also Schileyko, 2007: 2094). The systematic position of *Camptonyx* is uncertain and we provisionally include it in the Lymnaeoidea.

Campylonaus Benson, 1835

Family unknown
Remarks Benson (1835: 176) mentioned this "new genus" after examining three specimens collected by Lieut. McNair that he thought might be related to *Carinaria*. It is a *nomen nudum*.

Charax Benson, 1859 non Scopoli, 1777

Type species *Alycaeus hebes* Benson, 1859 by subsequent designation (Gude, 1921: 236)
Family Alycaeidae
Remarks Benson (1859g: 177) assigned six species to *Charax*, a section of *Alycaeus* he defined thus: "Constriction broad, contiguous to aperture, and divided more or less remotely from it, across the whorl, by a ridge which is hollow internally". *Charax* Benson is preoccupied and becomes a synonym of *Dicharax* Kobelt & Möllendorff, 1900; see *Dicharax*.

Clostophis Benson, 1860

Type species *Clostophis sankeyi* Benson, 1860 (type by monotypy)
Family/Subfamily Gastrocoptidae, Hypselostomatinae
Remarks This species was until recently only known from Benson's holotype, but has now been transferred from Diplommatinidae to the gastrocoptid subfamily Hypselostomatinae following the discovery of new material from near the type locality (Páll-Gergely et al., 2020c).

Coelopoma Benson, 1855 non Agassiz, 1841

Family "Cyclostomatidae"
Remarks Benson (1855e: 15) mentioned this genus as a substitute name for *Opisthoporus* Benson, 1851, as he considered *Opisthoporus* to be inappropriate. As an unjustified emendation *Coelopoma* Benson is an available name (Article 19.1) but it is a junior homonym of *Coelopoma* Agassiz, 1841 [Pisces].

Coilostele Benson, 1864

Type species *Coilostele scalaris* Benson, 1864 (type by monotypy)
Family Carychiidae
Remarks Benson (1864a) regarded *C. scalaris* as a member of the Auriculacea, a group that would now be attributed to the Ellobiidae. He based this attribution on the fact that the spiral axis of the upper whorls had been completely resorbed, a feature characteristic of ellobiids (cf. Solem, 1983). However, its similarity to *Cecilioides* led most subsequent authors (e.g. Gude, 1914a: 376; Thiele, 1931; Zilch, 1959: 337) to place *Coilostele* within the Ferussaciidae (see discussion in Naggs, 1997: 65–72). However, Pilsbry (1906), who also originally considered *Coilostele* to be a ferussaciid, subsequently changed his mind (Pilsbry, 1946b: 1051) and not only placed it within the Ellobiidae but also with the Carychiinae. He noted that this genus has a markedly disjunct distribution with records from southern Europe, Ethiopia, India, Timor and even eastern Mexico. *Coilostele* is often found in arid regions far removed from the humid habitats normally associated with most ellobiids. Moreover, most specimens have been recovered from the flood debris of rivers and the living animal has never been reported, prompting suggestions that it might be a burrowing species. However, Naggs (1997: figs 19 and 20) did find slides of its radula and jaws in the Gwatkin collection at the NHM, and these showed similarities to those of *Carychium*. Blanford (1875: 41) considered that *Coilostele* should be given more correctly as *Coelostele* and he introduced this as an amended replacement name; *Coelostele* is an unjustified emendation and therefore an objective junior synonym.

Dioryx Benson, 1859

Type species *Alycaeus amphora* Benson, 1856 by subsequent designation (Gude, 1921: 198)
Family Alycaeidae
Remarks Originally described as a subgenus of *Alycaeus*.

Diplommatina Benson, 1849

Type species *Bulimus folliculus* (L. Pfeiffer, 1846) by subsequent designation (Nevill, 1878: 284)
Family Diplommatinidae
Remarks Benson (1849a) erected this genus to accommodate a minute Himalayan species described by Pfeiffer (1846) as *Bulimus folliculus*. Hutton (in litt.) thought that this species was a pulmonate closely allied to *Carychium* because its eyes were not situated at the ends of the tentacles, as they are in other pulmonates. Benson expressed some doubt about this attribution but since the species appeared to lack an operculum he initially placed *Diplommatina* in the Carychiidae, currently recognized at subfamily level within the largely salt-marsh or mangrove-dwelling Ellobiidae. However, *Diplommatina* does possess a thin, transparent operculum, which is difficult to observe in live animals, and in retracted snails it is withdrawn into earlier whorls where it cannot be seen without breaking the shell. The dispute between Dr J.E. Gray and Dr L. Pfeiffer on the one hand, and Benson and Hutton on the other, relating to the existence of an

operculum in *Diplommatina* became quite lively (Benson, 1853e; 1855d; Gray, 1853; 1855) before Benson himself discovered the hidden opercula set 2 whorls back from the aperture (see Naggs, 1997: 57–65 for a full exposition of this affair). *Diplommatina* is a very speciose genus comprising several hundred species (Budha et al., 2017b).

Helicorbis Benson, 1855

Type species *Planorbis umbilicalis* Benson, 1836 by subsequent designation (Baker, 1945: 106)
Family/Subfamily Planorbidae, Planorbinae (Tribe Segmentinini)
Remarks Brandt (1974) listed *Planorbis caenosus* Benson, 1850 and *P. trochoideus* Benson, 1836 in the synonymy of *P. umbilicalis* Benson, 1836. Since *P. trochoideus* is the type species of *Trochorbis* Benson, 1855 (see below), this would make it congeneric with *Helicorbis* Benson, 1855. However, *trochoideus*, unlike *umbilicalis* and *caenosus*, has well developed internal septa (Plate 35, Fig. E–F), refuting Brandt's suggestion regarding the synonymy of these planorbids. *Helicorbis* is clearly distinct from *Trochorbis* but their relations to *Hippeutis* and *Segmentina* respectively require clarification (see below).

Heteropoma Benson, 1856

Type species *Paludomus sulcatus* Reeve, 1847 by subsequent designation (Neiber and Glaubrecht, 2019: 333)
Family/Subfamily Paludomidae, Paludominae
Remarks *Heteropoma* was a manuscript name for *Philopotamis* Layard, 1855 used by Benson in a communication to Edgar Layard in 1852 and mentioned in Benson (1856g: 494). No species had been directly associated with *Heteropoma* Benson until Neiber and Glaubrecht (2019) referred *Paludomus sulcatus* Reeve, 1847 to it as its type species. As a consequence, *Heteropoma* Benson, 1856 becomes an objective junior synonym of *Philopotamis* Layard, 1855 (same type species).

Hybocystis Benson, 1859

Type species *Megalomastoma gravidum* Benson, 1856 by original designation
Family/Subfamily Pupinidae, Pupinellinae
Remarks Benson (1859j) described a new genus *Hybocystis* containing a single species (*M. gravidum*) from Burma but he subsequently noted that *Hybocystis* was preoccupied by *Pollicaria* Gould, 1856 (Benson, 1860f). The type species of *Pollicaria*, *Cyclostoma pollex* Gould, 1856 [October], is recognized as a junior subjective synonym of *Megalomastoma gravidum* Benson, 1856 [March].

Hypselostoma Benson, 1856

Type species *Hypselostoma tubiferum* Benson, 1856 (type by monotypy)
Family/Subfamily Gastrocoptidae, Hypselostomatinae
Remarks Benson (1856h) had used the name *Tanystoma* for "a curious Anostomatous form from Burmah" but later reassigned it to *Hypselostoma* since *Tanystoma* was preoccupied by a genus of Coleoptera (Benson, 1856i). Zilch (1959) proposed the Hypselostomatinae (within Chondrinidae) to accommodate *Hypselostoma* (type genus), *Boysidia*, *Bensonella* and other genera. Gittenberger (1973) synonymized Hypselostomatinae and Aulacospirinae with Gastrocoptinae, whereas Schileyko (1998b) recognized Hypselostomatidae at family rank. Bouchet et al. (2017) recognize Hypselostomatinae as a subfamily within Gastrocoptidae.

Incilaria Benson, 1842

Type species *Incilaria bilineata* Benson, 1842 (type by monotypy)
Family Philomycidae
Remarks Wiktor et al. (2000) treated *Incilaria* Benson, 1842 as a junior synonym of *Meghimatium* van Hasselt, 1823.

Laguncula Benson, 1842

Type species *Laguncula pulchella* Benson, 1842 (type by monotypy)
Family Naticidae
Remarks *Bensonia* Gray, 1847 and *Scarlatia* Schileyko, 1977 are synonyms.

Nematura Benson, 1837

non Fischer von Waldheim, 1813

Type species *Nematura deltae* Benson, 1837 (type by monotypy)
Family Stenothyridae
Remarks *Nematura* has been attributed to both "Benson, 1836 (1837)" and "G.B. Sowerby I (1837)" by Sherborn (1928: 4282). However, Sowerby attributed the name to Benson who seems to have published it first. This is immaterial as the name is preoccupied and was replaced by *Stenothyra* Benson, 1856 (see below).

Novaculina Benson, 1830

Type species *Novaculina gangetica* Benson, 1830 (type by monotypy)
Family/Subfamily Pharidae, Pharellinae

Remarks This Asian genus is the only known freshwater representative of Pharidae. Four species have been assigned to this genus (Bolotov et al. 2018b): *gangetica* (Ganges and smaller basins in Bangladesh and NW Burma), *siamensis* (Bang Pakong and Pasak rivers in Thailand and Mekong River in Vietnam), *chinensis* (lower Yangtze River, China) and *myanmarensis* (Ayeyarwady and Salween basins, Burma).

Omalodiscus Benson, 1855

Remarks Benson (1855a: 127) mentioned *Spirorbis* Swainson in synonymy, and probably intended *Omalodiscus* as a replacement name for *Spirorbis* Swainson, 1840, non Daudin, 1800.

Opisthoporus Benson, 1851

Type species *Cyclostoma taylorianum* L. Pfeiffer, 1851 by subsequent designation (Kobelt, 1912)
Family/Subfamily Cyclophoridae, Cyclophorinae
Remarks *Opisthoporus* was described by Benson (in Pfeiffer, 1851: 8) as a section of *Cyclostoma*. He subsequently provided further details of its characters and affinities but did not designate a type species (Benson, 1855e). Kobelt (1912 [in 1911–1914]) fixed the type as "*O. biciliatus* Mousson" and simultaneously cited *Cyclostoma taylorianum* in its synonymy thereby validly fixing the type species. Wenz (1938: 465) subsequently invalidly designated *Cyclostoma rostellatum* L. Pfeiffer (also an originally included species) as the type species, an error recently repeated by Low and Tan (2017).

Oxygyrus Benson, 1835

Type species *Oxygyrus inflatus* Benson, 1835 by original designation
Family Atlantidae

Plectopylis Benson, 1860

Type species *Helix achatina* L. Pfeiffer, 1845 by subsequent designation (Pilsbry, 1894: 143–144)
Family/Subfamily Plectopylidae, Plectopylinae
Remarks *Helix achatina* L. Pfeiffer, 1845, is a junior homonym of *Helix achatina* Gmelin, 1791, and *Helix achatina* Potiez & Michaud, 1838. Gude (1914) provided the replacement name *Plectopylis bensoni*, for which Páll-Gergely (2018: 79) has recently designated a neotype. *Plectopylis* is the type genus of the Plectopylidae.

Pterocyclos Benson, 1832

Type species *Pterocyclos rupestris* Benson, 1832 (type by monotypy)
Family/Subfamily Cyclophoridae, Cyclophorinae (Tribe Pterocyclini)
Remarks Benson (1848c) provided additional notes relating to taxa that he put in the synonymy of this genus and Blanford (1863c) described the animal (under *Spiraculum*). *Pterocyclos* is the type genus of the tribe Pterocyclini.

Rhiostoma Benson, 1860

Type species *Rhiostoma haughtoni* Benson, 1860 by subsequent designation (Gude, 1921: 127)
Family/Subfamily Cyclophoridae, Cyclophorinae (Tribe Pterocyclini)

Scaphula Benson, 1834

Type species *Scaphula celox* Benson, 1836 (type by subsequent monotypy)
Family/Subfamily Arcidae, Anadarinae
Remarks Benson (1834a: 91) proposed the generic name *Scaphula* for specimens found in "the bed of the Jumna at Humeerpore in Bundelkund". Mienis and Rittner (2016) have recently provided a brief review of this genus.

Serenia Benson, 1856

A manuscript name for *Tanalia* Gray, 1847 used by Benson in a communication to Edgar Layard in 1852 and mentioned in Benson (1856g: 494). *Serenia* is not an available name because it has neither been adopted as the name of a taxon nor been treated as a senior homonym (see Neiber and Glaubrecht, 2019: 334).

Sophina Benson, 1859

Type species *Helix schistostelis* Benson, 1859 by subsequent designation (Tate, 1868: 41)
Family/Subfamily Helicarionidae, Durgellinae (Tribe Durgellini)
Remarks Benson (1859d) included *Helix calias* and *Helix schistostelis* within *Sophina* but he did not nominate a type species. *Helix schistostelis* was subsequently fixed as the type species of *Sophina* by Tate (1868: 41). *Sophina* is the type genus of Sophininae Blanford & Godwin-Austen, 1908, which is now included within the Durgellinae.

Stenothyra Benson, 1856

Type species *Nematura deltae* Benson, 1837 by typification of a replaced name
Family Stenothyridae
Remarks *Stenothyra* is a replacement name for *Nematura,* a junior homonym preoccupied in Aves (see entry for *Nematura* above). *Stenothyra* is the type genus of the Stenothyridae.

Stomatodon Benson, 1862

Type species *Tanalia* ? *stomatodon* Benson, 1862 (type by monotypy)
Family/Subfamily Paludomidae, Paludominae
Remarks Benson (1862a: 414) described a new species of freshwater paludomid snail from the Travancore Hills behind Trevandrum as *Tanalia* ? *stomatodon*. He noted that "Unfortunately, all the specimens were deficient in the operculum, which when examined, may possibly authorize its transfer to a new genus, in which case the specific name may fairly be employed to designate it" (Benson, 1862a: 414). However, Tomlin (1930: 23) pointed out that *Stomatodon* Benson, 1862 is preoccupied by *Stomatodon* Seeley, 1861 used for a fossil from the Cambridgeshire Greensand and he proposed the replacement name *Odontochasma*. Consequently, the monotypic genus-group *Odontochasma* Tomlin, 1930, which is unique among Paludomidae in possessing a shell with a distinct fold on the columella, replaces *Stomatodon* Benson, 1862 (see discussion in Neiber and Glaubrecht, 2019).

Streptaulus Benson 1857

Type species *Streptaulus blanfordi* Benson, 1857 (type by monotypy)
Family/Subfamily Pupinidae, Pupinellinae
Remarks There has been uncertainty about whether *Streptaulus* Benson, 1857, containing three species from northern India, and *Rhaphaulus* L. Pfeiffer, 1856, with 14 species distributed from northern Borneo to northeastern India, are congeneric (see Páll-Gergely et al., 2014). However, their distinction has recently been upheld on the basis of differences in the development of the parietal callus, the nature of the periostome and the form of the breathing tube (Páll-Gergely et al., 2017b).

Tanychlamys Benson, 1834

Type species *Tanychlamys indica* (Godwin-Austen, 1883) by subsequent monotypy (Baker, 1941; 210–211).
Family/Subfamily Ariophantidae, Tanychlamyinae
Remarks *Tanychlamys* Benson (1834a: 89) was introduced in synonymy of *Nanina* Gray (1834: 58). Nevertheless, *Tanychlamys*, which is the type genus of Tanychlamyinae H.B. Baker, 1928, is available because Baker (1941, 1946) used it as a valid name prior to 1961 (ICZN Art. 11.6 and Art 11.6.1).

Tanysiphon Benson, 1858

Type species *Tanysiphon rivalis* Benson, 1858 (type by monotypy)
Family/Subfamily Mactridae, Tanysiphoninae
Remarks *Tanysiphon* is a freshwater member of the Mactridae and is the type of Tanysiphoninae.

Tanystoma Benson, 1856

Type species *Tanystoma tubiferum* Benson, 1856 (type by monotypy)
Family/Subfamily Gastrocoptidae, Hypselostomatinae
Remarks Benson (1856h: 129) described this genus, which is an invalid junior homonym of *Tanystoma* Motschulsky, 1845 [Coleoptera]; see *Hypselostoma*.

Tomichia Benson, 1851

Type species *Truncatella ventricosa* G.B. Sowerby I, 1842 (type by monotypy)
Family/Subfamily Pomatiopsidae, Pomatiopsinae
Remarks *Tomichia* is the only genus of Pomatiopsidae known from Africa, where it is represented by 12 described species that occur in South and Central Africa (Verdcourt, 1951; Brown, 2002). The subfamily Tomichiinae was diagnosed by Wenz (1939 [in 1938–1944]: 582) with *Tomichia* as the type genus (see Wilke et al., 2013 for a phylogeny).

Tricula Benson, 1843

Type species *Tricula montana* Benson, 1843 (type by monotypy)
Family/Subfamily Pomatiopsidae, Pomatiopsinae (Tribe Triculini)
Remarks Benson's original description flagged *Tricula* as a "subgenus", but it was not subordinated to any genus. *Tricula* was formerly regarded as the type genus of the Triculinae, a subfamily included within the Pomatiopsidae, but is now thought to form a tribe within the Pomatiopsinae (Bouchet et al., 2017).

Trochorbis Benson, 1855

Type species *Planorbis trochoideus* Benson, 1836 (type by monotypy)
Family/Subfamily Planorbidae, Planorbinae (Tribe Segmentinini)
Remarks Benson (1850c: 352) noted the trochoid form and small umbilicus of *trochoideus*, subsequently erecting the genus *Trochorbis* to accommodate it (Benson, 1855a: 126). The genus has been overlooked by most subsequent workers. Brandt (1974) included *P. trochoideus* in the synonymy of *P. umbilicalis* Benson, 1836, which would make *Trochorbis* Benson, 1855 a synonym of *Helicorbis* Benson, 1855 (see above). Moreover, Baker (1945) noted the similarity of *Trochorbis* to *Polypylis*, whereas Dall (1906: 105) and Kennard and Woodward (1926) considered *Trochorbis* a synonym of *Segmentina* Fleming, 1817. Clearly thereis considerable uncertainty regarding the validity

of these planorbid genera, but it is clear that *trochoideus* (and hence *Trochorbis*) with internal septa belongs to a different genus to *umbilicalis* (and hence *Helicorbis*), which lack septa. However, the relations between *Trochorbis* and *Segmentina*/*Polypylis* and between *Helicorbis* and *Hippeutis* require resolution (cf. Albrecht et al., 2007).

As well as the genus-group names listed above that he introduced himself, several of Benson's taxa have also served as type species for genera described by others (Table 4).

TABLE 4. List of genus-groups with type taxa described by William Henry Benson.

Genus / Subgenus [SG]	Type species described by Benson	Family, Subfamily	Designation
Acmella W.T. Blanford, 1870	*Cyclostoma tersum* Benson, 1853	Assimineidae, Assimineinae	Monotypy
Acusta E. von Martens, 1860	*Helix ravida* Benson, 1842	Camaenidae, Bradybaeninae	Original designation
Andamanica A.J. Wagner, 1905	*Helicina andamanica* Benson, 1860	Helicinidae, Helicininae	Tautonymy
Angulyagra Rao, 1931	*Paludina oxytropis* Benson, 1836	Viviparidae, Bellamyinae	By typification of replaced name
Antimelania P. Fischer & Crosse, 1892	*Melania variabilis* Benson, 1830	Pachychilidae	Subsequent designation
Atyscaphander Annandale, 1924	*Bullaea caurina* Benson, 1842 (as *Bullaea exarata* Philippi, 1849)	Haminoeoidae, Bullactinae	Original designation
Austenia G. Nevill, 1878	*Vitrina gigas* Benson, 1836	Helicarionidae, Durgellinae	Original designation
Balwantia Prashad, 1919	*Anodonta soleniformis* Benson, 1836	Unionidae, Gonideinae	Monotypy
Bensonella Pilsbry & Vanatta, 1900	*Pupa plicidens* Benson, 1849	Gastrocoptidae, Hypselostomatinae	Original designation
Bensonia J.E. Gray, 1847	*Laguncula pulchella* Benson, 1842	Naticidae	Original designation
Bullacta Bergh, 1901	*Bullaea caurina* Benson, 1842	Haminoeoidae, Bullactinae	Monotypy
Camptoceras Benson, 1843	*Camptoceras terebra* Benson, 1843	Planorbidae, Planorbinae	Monotypy
Camptonyx Benson, 1858	*Camptonyx theobaldi* Benson, 1858	Lymnaeoidea	Monotypy
Chamalycaeus Kobelt & Möllendorff, 1897 *	*Alycaeus andamaniae* Benson, 1861	Alycaeidae	Subsequent designation
Charax Benson, 1859	*Alycaeus hebes* Benson, 1857	Alycaeidae	Subsequent designation
Chersaecia Gude, 1899	*Helix leiophis* Benson, 1860	Plectopylidae, Plectopylinae	Original designation
Clostophis Benson, 1860	*Clostophis sankeyi* Benson, 1860	Gastrocoptidae, Hypselostomatinae	Subsequent designation
Coilostele Benson, 1864	*Coilostele scalaris* Benson, 1864	Carychiidae	Monotypy
Conulema Stoliczka, 1871	*Helix attegia* Benson, 1859	Helicarionidae, Durgellinae	Original designation
Craspedotropis W.T. Blanford, 1864	*Cyclostoma cuspidata* Benson, 1851	Cyclophoridae, Cyclophorinae	Monotypy
Cryptaustenia Cockerill, 1891	*Vitrina planospira* Benson, 1859	Helicarionidae, Durgellinae	Monotypy
Ctenophila Ancey, 1882	*Helix caldwelli* Benson, 1859	Helicarionidae, Helicarioninae	Subsequent designation
Cyathopoma W.T. & H.F. Blanford, 1861	*Cyclostoma filocinctum* Benson, 1851	Cyclophoridae, Cyclophorinae	Subsequent designation
Cyclocystis H. Watson, 1934	*Helix charybdis* Benson, 1856	Charopidae, Charopinae	Original designation
Cycloryx Godwin-Austen, 1914	*Cyclostoma constrictum* Benson, 1851	Alycaeidae	Original designation
Dactylochlamys Rao, 1925	*Paludina oxytropis* Benson, 1836	Viviparidae, Bellamyinae	Original designation
Dicharax Kobelt & Möllendorff, 1900	*Alycaeus hebes* Benson, 1857	Alycaeidae	Subsequent designation
Digoniostoma Annandale & Prashad, 1921	*Paludina cerameopoma* Benson, 1830	Bithyniidae	Original designation
Dioryx Benson, 1859	*Alycaeus amphora* Benson, 1856	Alycaeidae	Subsequent designation
Durgella W.T. Blanford, 1863	*Helix levicula* Benson, 1859	Helicarionidae, Durgellinae	Subsequent designation
Endoplon Gude, 1899	*Helix brachyplecta* Benson, 1863	Plectopylidae, Plectopylinae	Original designation
Endothyra Gude 1899 non Phillips, 1845	*Helix plectostoma* Benson, 1836	Plectopylidae, Sinicolinae	Original designation
Endothyrella Zilch, 1960	*Helix plectostoma* Benson, 1836	Plectopylidae, Sinicolinae	By typification of replaced name
Euaustenia Cockerill, 1891	*Vitrina scutella* Benson, 1859	Ariophantidae, Tanychlamyinae	Monotypy
Eucochlias G. Nevill, 1878	*Helix ochthoplax* Benson, 1860	Camaeinidae, Camaeininae	Original designation

TABLE 4. continued

Genus / Subgenus [SG]	Type species described by Benson	Family, Subfamily	Designation
Eutomopeas Pilsbry, 1946	*Spiraxis layardi* Benson, 1863	Achatinidae, Thyrophorellinae	By typification of replaced name
Fauxulella Pilsbry, 1917	*Pupa pamphorodon* Benson, 1864	Fauxulidae	Monotypy
Ganesella W.T. Blanford, 1863	*Helix capitium* Benson, 1848	Camaenidae, Camaeninae	Subsequent designation
Gastrocopta Wollaston, 1878	*Pupa acarus* Benson, 1856	Gastrocoptidae, Gastrocoptinae	Subsequent designation
Georissa W.T. Blanford, 1864	*Hydrocena pyxis* Benson, 1856	Hydrocenidae	Original designation
Glyptaulax Gude, 1914	*Helix artificiosa* Benson, 1856	Charopidae, Thysanotinae	Original designation
Helicorbis Benson, 1855	*Planorbis umbilicalis* Benson, 1836	Planorbidae, Planorbinae	Subsequent designation
Hemiphaedusa O. Boettger, 1877	*Clausilia pluviatilis* Benson, 1842	Clausiliidae, Phaedusinae	Subsequent designation
Hijabia Godwin-Austen, 1897	*Cyclostoma wahlbergi* Benson, 1852	Maizaniidae	By typification of replaced name
Hybocystis Benson, 1859	*Megalomastoma gravidum* Benson, 1856	Pupinidae, Pupinellinae	Original designation
Hypselostoma Benson, 1856	*Hypselostoma tubiferum* Benson, 1856	Gastrocoptidae, Hypselostomatinae	Monotypy
Incilaria Benson, 1842	*Incilaria bilineata* Benson, 1842	Philomycidae	Monotypy
Indochinella Bolotov et al., 2018	*Unio pugio* Benson, 1862	Unionidae, Parreysiinae	Original designation
Indrella Godwin-Austen, 1901	*Helix ampulla* Benson, 1850	Ariophantidae, Ariophantinae	Monotypy
Iridona Huber et al., 2015	*Sanguinolaria iridescens* Benson, 1842	Psammobiidae	Original designation
Jerdonia W.T. & H.F. Blanford, 1861	*Cyclostoma trochlea* Benson, 1851	Cyclophoridae, Cyclophorinae	Subsequent designation
Lagocheilus W.T. Blanford, 1864	*Cyclophorus scissimargo* Benson, 1856	Cyclophoridae, Cyclophorinae	Original designation
Laguncula Benson, 1842	*Laguncula pulchella* Benson, 1842	Naticidae	Monotypy
Lecythoconcha Annandale, 1920	*Paludina lecythis* Benson, 1836	Viviparidae, Bellamyinae	Original designation
Leptopomoides G. Nevill, 1878	*Cyclostoma halophilum* Benson, 1851	Cyclophoridae, Cyclophorinae	Subsequent designation
Louisia Godwin-Austen, 1908	*Helix barclayi* Benson, 1850	Euconulidae, Euconulinae	Subsequent designation
Montiphaedusa H. Nordsieck, 2002 [SG]	*Clausilia ioes* Benson, 1852	Clausiliidae, Phaedusinae	Original designation
Musculista Yamamoto & Habe, 1958	*Modiola senhousia* Benson, 1842	Mytilidae, Mytilinae	Original designation
Natalia Godwin-Austen, 1897	*Cyclostoma wahlbergi* Benson, 1852	Maizaniidae	Original designation
Nematura Benson, 1837 non Fischer von Waldheim, 1813	*Nematura deltae* Benson, 1837	Stenothyridae	Monotypy
Nilgiria Godwin-Austen, 1888	*Helix solata* Benson, 1848	Ariophantidae, Tanychlamyinae	Original designation
Novaculina Benson, 1830	*Novaculina gangetica* Benson, 1830	Pharidae, Pharinellinae	Monotypy
Odontochasma Tomlin, 1930 [SG]	*Paludomus stomatodon* Benson, 1862	Paludomidae, Paludominae	By typification of replaced name
Oxygyrus Benson, 1835	*Oxygyrus inflatus* Benson, 1835	Atlantidae	Monotypy
Oxytes L. Pfeiffer, 1855 non Giebel, 1848	*Helix oxytes* Benson, 1836	Ariophantidae, Tanychlamyinae	Tautonymy
Oxytesta Zilch, 1956	*Helix oxytes* Benson, 1836	Ariophantidae, Tanychlamyinae	By typification of replaced name
Parafossarulus Annandale, 1924	*Paludina (Bithynia) striatula* Benson, 1842	Bithyniidae	Original designation
Parazoogenetes Habe, 1956	*Helix orcula* Benson, 1850	Valloniidae	Monotypy
Pella E. von Martens, 1860	*Helix bisculpta* Benson, 1851	Charopidae, Charopinae	Original designation
Peltatus Godwin-Austen, 1908	*Helix hudsoniae* Benson, 1864	Urocyclidae, Sheldoniinae	Original designation but based on a misidentification of *H. hudsoniae*
Plectorhagada Iredale, 1933	*Helix plectilis* Benson, 1853	Camaenidae, Camaeninae	Original designation
Polypylis Pilsbry, 1906	*Planorbis hemisphaerula* Benson, 1842 (as *Planorbis largillierti* Dunker, 1867)	Planorbidae, Planorbinae	Original designation
Pseudocaldwellia Germain, 1918	*Helix barclayi Benson, 1850*	Euconulidae, Euconulinae	Subsequent designation
Pterocyclos Benson, 1832	Pterocyclos rupestris Benson, 1832	Cyclophoridae, Cyclophorinae	Monotypy
Pupennea Páll-Gergely, 2020	*Pupa planguncula* Benson, 1863	Diapheridae	Original designation
Radiatula Simpson, 1900	*Unio crispisulcatus* Benson, 1862	Unionidae, Parreysiinae	Original designation

TABLE 4. continued

Genus / Subgenus [SG]	Type species described by Benson	Family, Subfamily	Designation
Rahula Godwin-Austen, 1907	*Helix macropleuris* Benson, 1859	Trochomorphidae	Original designation
Ranibania Schileyko & Kuznetsov, 1996	*Achatina tenuispira* Benson, 1836	Achatinidae, Glessulinae	Original designation
Rhiostoma Benson, 1860	*Rhiostoma haughtoni* Benson, 1860	Cyclophoridae, Cyclophorinae	Subsequent designation
Rhyssotopis Ancey, 1887	*Rhiostoma haughtoni* Benson, 1860	Cyclophoridae, Cyclophorinae	Original designation
Rishetia GodwinAusten, 1920	*Achatina tenuispira* Benson, 1836	Achatinidae, Glessulinae	Original designation
Scabrina W.T. Blanford, 1863	*Cyclophorus pinnulifer* Benson, 1857	Cyclophoridae, Cyclophorinae	Subsequent designation
Scaphula Benson, 1834	*Scaphula celox* Benson, 1836	Arcidae, Anadarinae	By subsequent monotypy
Sheldonia Ancey, 1888	*Helix trotteriana* Benson, 1848	Urocyclidae, Sheldoniinae	Subsequent designation
Sinotaia Haas, 1939	*Paludina quadrata* Benson, 1842	Viviparidae, Bellamyidae	Original designation
Sitala H. Adams, 1865	*Helix infula* Benson, 1848	Helicarionidae, Durgellinae	Original designation
Sivella W.T. Blanford, 1863	*Helix castra* Benson, 1852	Trochomorphidae	Subsequent designation
Sophina Benson, 1859	*Helix schistotelis* Benson, 1859	Helicarionidae, Durgellinae	Subsequent designation
Stenothyra Benson, 1856	*Nematura deltae* Benson, 1837	Stenothyridae	By typification of replaced name
Stomatodon Benson, 1862 non Seeley, 1861 [SG]	*Paludomus stomatodon* Benson, 1862	Paludomidae, Paludominae	Monotypy
Streptaulus Benson, 1857	*Streptaulus blanfordi* Benson, 1857	Pupinidae, Pupinellinae	Monotypy
Tachyphasis Germain, 1918	*Helix caldwelli* Benson, 1859	Helicarionidae, Helicarioninae	Subsequent designation
Tanysiphon Benson, 1858	*Tanysiphon rivalis* Benson, 1858	Mactridae, Tanysiphoninae	Monotypy
Tanystoma Benson, 1856	*Tanystoma tubiferum* Benson, 1856	Gastrocoptidae, Hypselostomatinae	Monotypy
Taphrospira W.T. Blanford, 1905	*Helix convallata* Benson, 1856	Ariophantidae, Tanychlamyinae	Original designation
Tomopeas Pilsbry, 1906	*Spiraxis layardi* Benson, 1863	Achatinidae, Thyrophorellinae	Original designation
Tortaxis Pilsbry, 1906	*Achatina erecta* Benson, 1842	Achatinidae, Glessulinae	Original designation
Trachycystis Pilsbry, 1893	*Helix bisculpta* Benson, 1851	Charopidae, Charopinae	By typification of replaced name
Tricula Benson, 1843	*Tricula montana* Benson, 1843	Pomatiopsidae, Pomatiopsinae	Monotypy
Trochomorphoides G. Nevill, 1878 [SG]	*Helix acris* Benson, 1859	Camaenidae, Camaeninae	Original designation
Trochorbis Benson, 1855	*Planorbis trochoideus* Benson, 1836	Planorbidae, Planorbinae	Monotypy

* this designation was found to be incorrect (Páll-Gergely et al., 2020a)

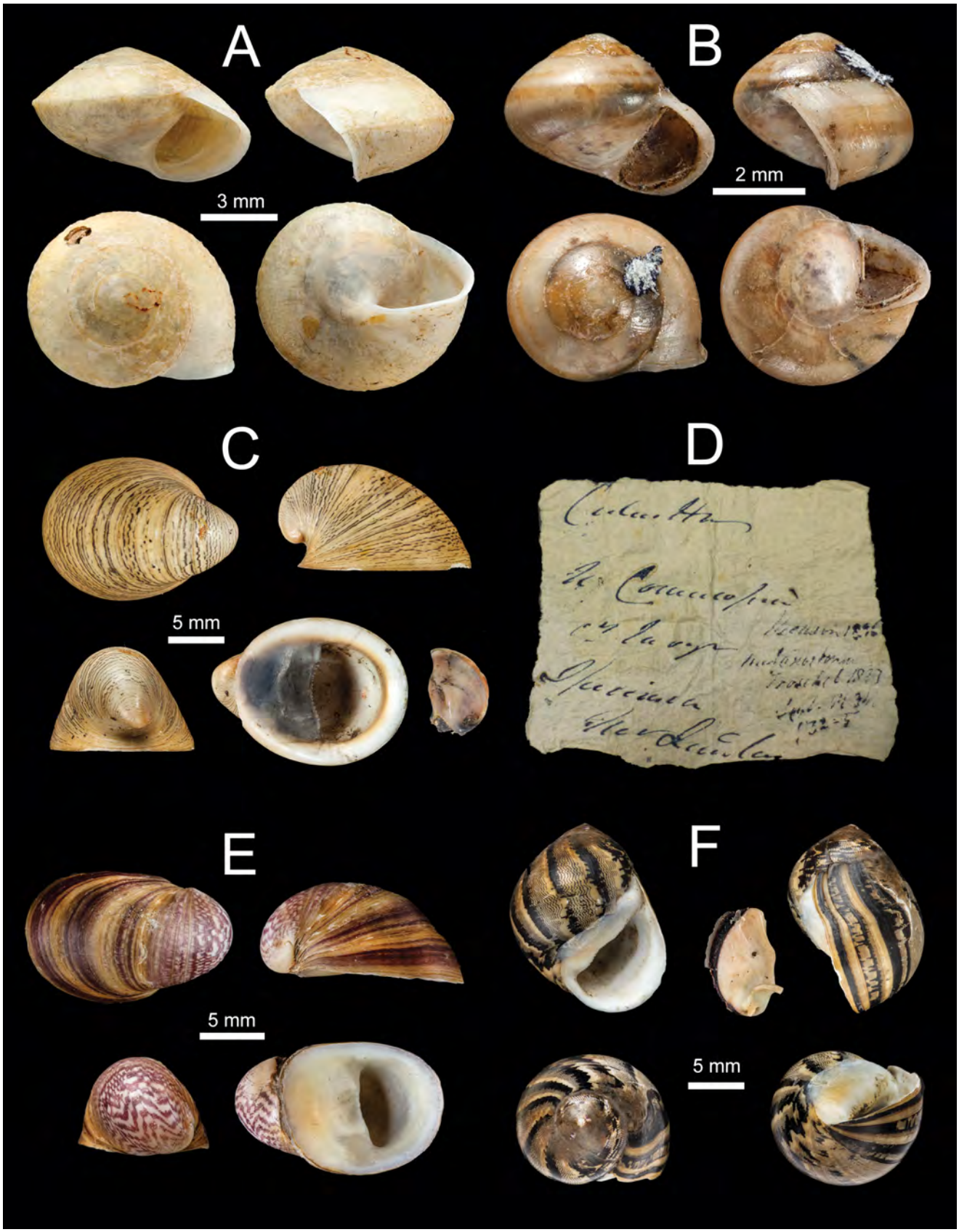


FIGURE 15. A. *Helicina andamanica* Benson, 1860 (UMZC I.103350.A, holotype). B. *Helicina scrupulum* Benson, 1862 (NHMUK 1888.12.4.97, holotype). C. *Neritina cornucopia* Benson, 1836 (UMZC I.105195, syntype). D. Benson's original label that accompanies C. E. *Neritina depressa* Benson, 1836 (NHMUK 1841.7.23.27, lectotype). F. *Neritina tigrina* Benson, 1836 (NHMUK 20140425/1, Cuming collection).

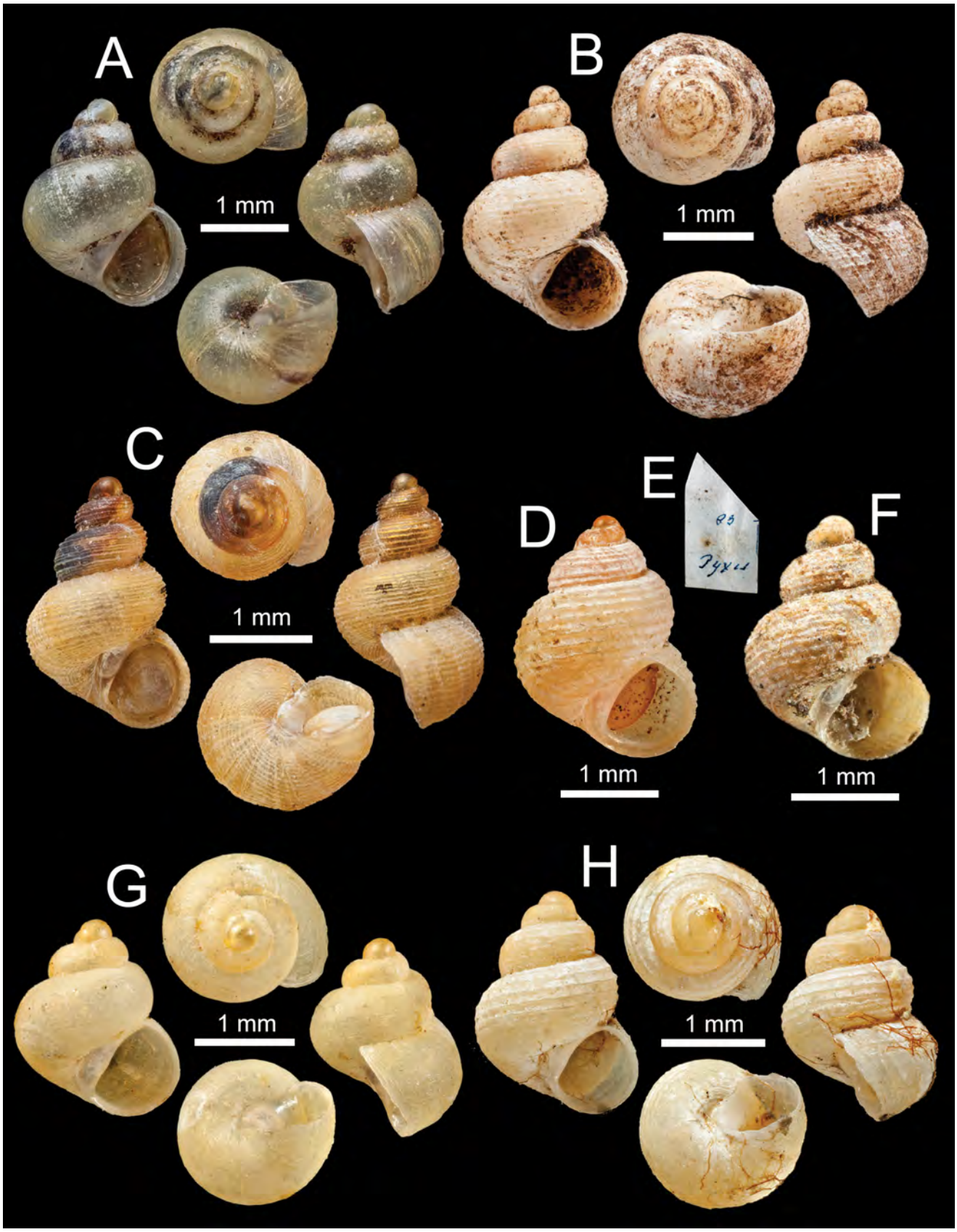


FIGURE 16. **A.** *Hydrocena noticola* Benson, 1856 (NHMUK 1937.12.30.5007, Connolly collection). **B.** *Hydrocena frustrillum* Benson, 1860 (UMZC I.105205.A, syntype). **C.** *Hydrocena illex* Benson, 1856 (UMZC I.102510, syntype). **D–F.** *Hydrocena pyxis* Benson, 1856 (C: UMZC I.105280.A, with operculum, Benson collection; D: Benson's original label that accompanies C; D: NHMUK 1888.12.4.298, Theobald collection). **G.** *Hydrocena rawesiana* Benson, 1860 (UMZC I.103105). **H.** *Cyclostoma sarritum* Benson, 1851 (UMZC I.103725.A, syntype).

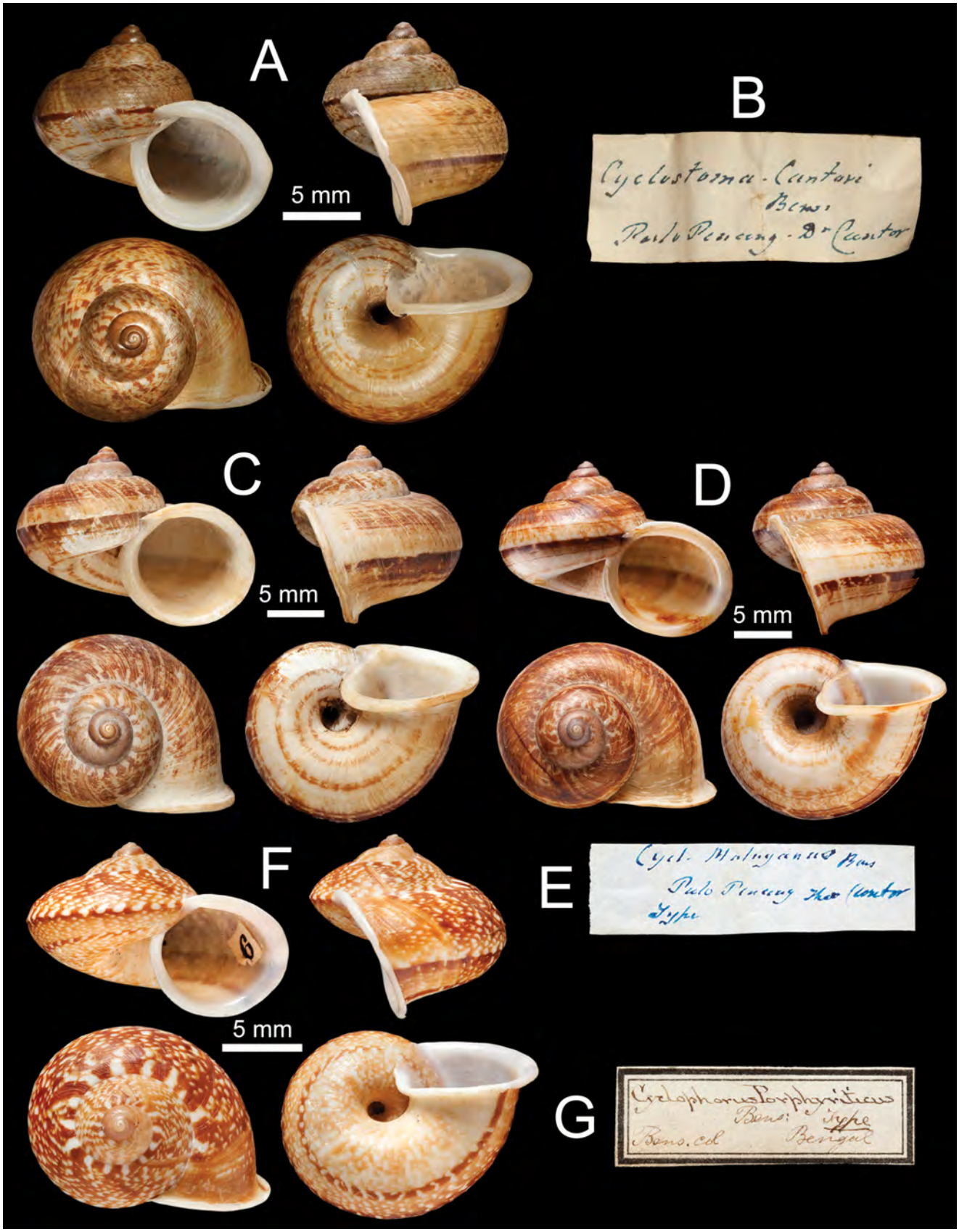


FIGURE 17. A–B. *Cyclostoma cantori* Benson, 1851 (A: UMZC I.104195.A, syntype; B: Benson's original label that accompanies A). **C–E.** *Cyclostoma malayanum* Benson, 1852 (C: UMZC I.103870, lectotype; D: NHMUK 20130089/1, paralectotype; E: Benson's original label that accompanies D). **F–G.** *Cyclostoma porphyriticum* Benson, 1851 (F: UMZC I.103710, syntype; G: McAndrew's label that accompanies F).

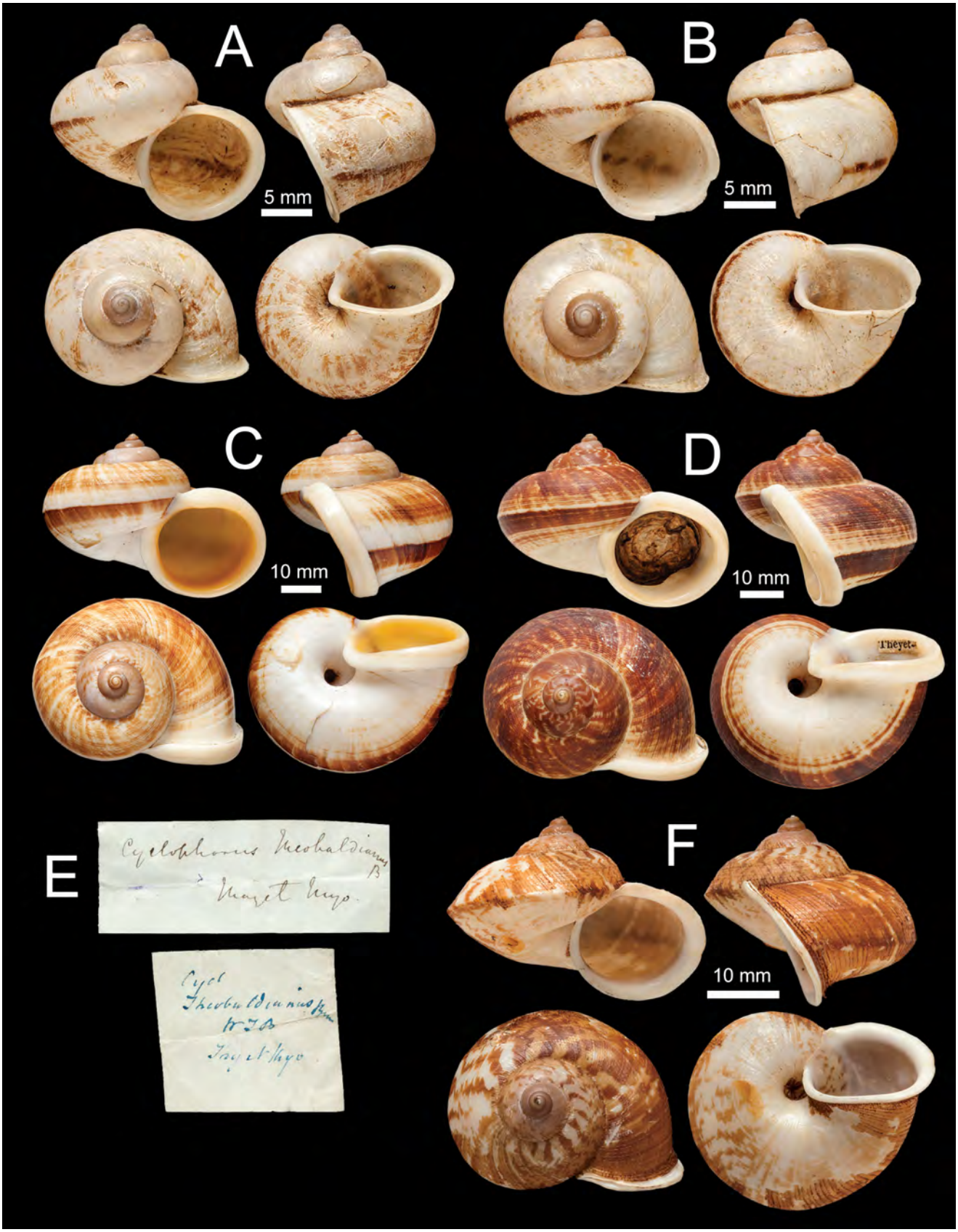


FIGURE 18. **A–B.** *Cyclophorus scurra* Benson, 1857 (A: UMZC I.102665, neotype; B: UMZC I.102670, Benson collection). **C–D.** *Cyclophorus theobaldianus* Benson, 1857 (C: UMZC I.102580.A, syntype; D: UMZC I.102585.A, syntype). **E.** Benson's original labels that accompany C. **F.** *Cyclostoma zebrinum* Benson, 1836 (UMZC I.102055.A, syntype).

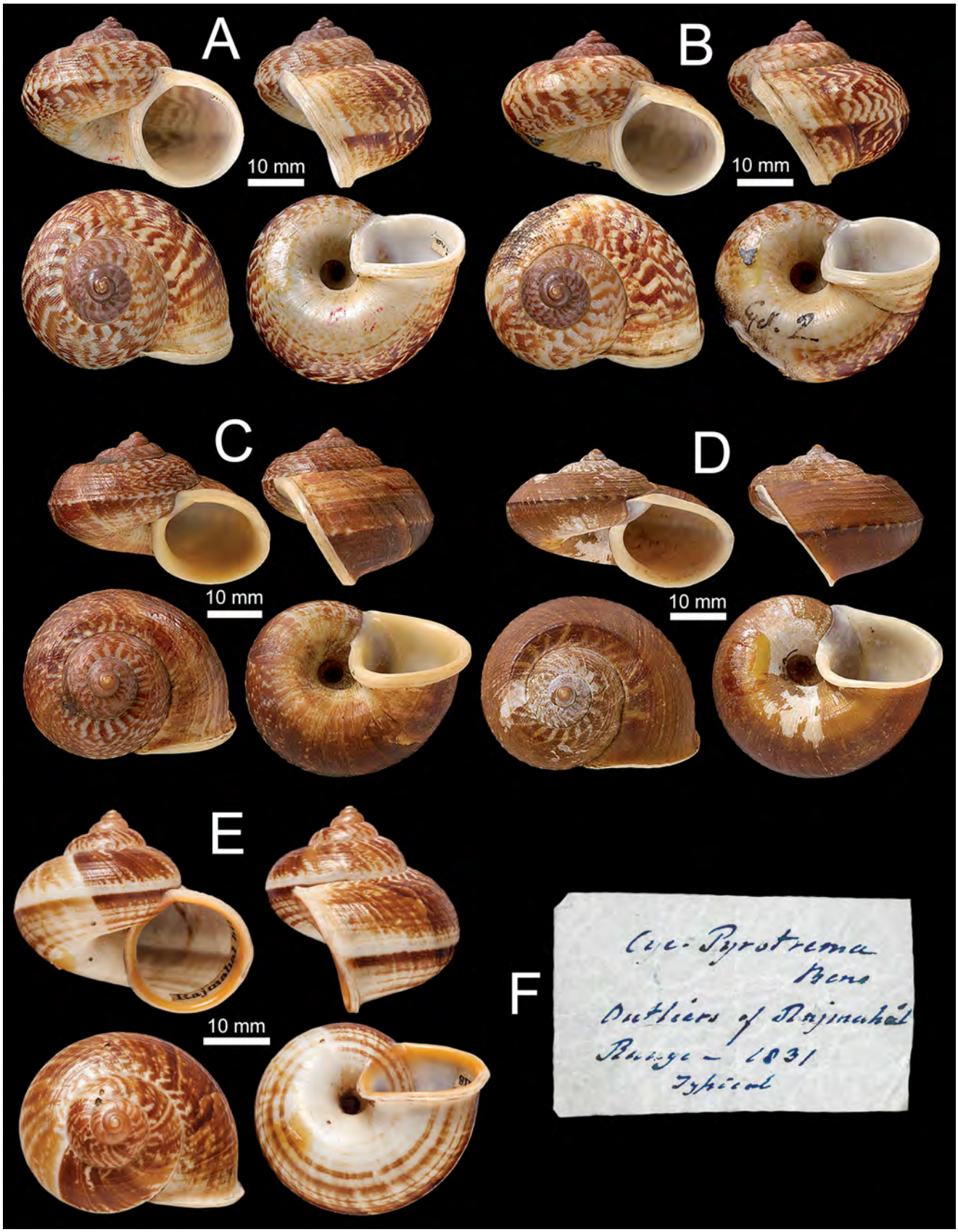


FIGURE 19. A–B. *Cyclostoma jerdoni* Benson, 1851 (A: UMZC I.103685.A, lectotype; B: UMZC I.103685.B, paralectotype). **C–D.** *Cyclostoma nilagiricum* Benson, 1852 (C: UMZC I.103890.A, lectotype; D: UMZC I.103890.C, paralectotype). **E–F.** *Cyclophorus pyrotrema* Benson, 1854 (E: UMZC I.103845.A, syntype; F: Benson's original label that accompanies E).

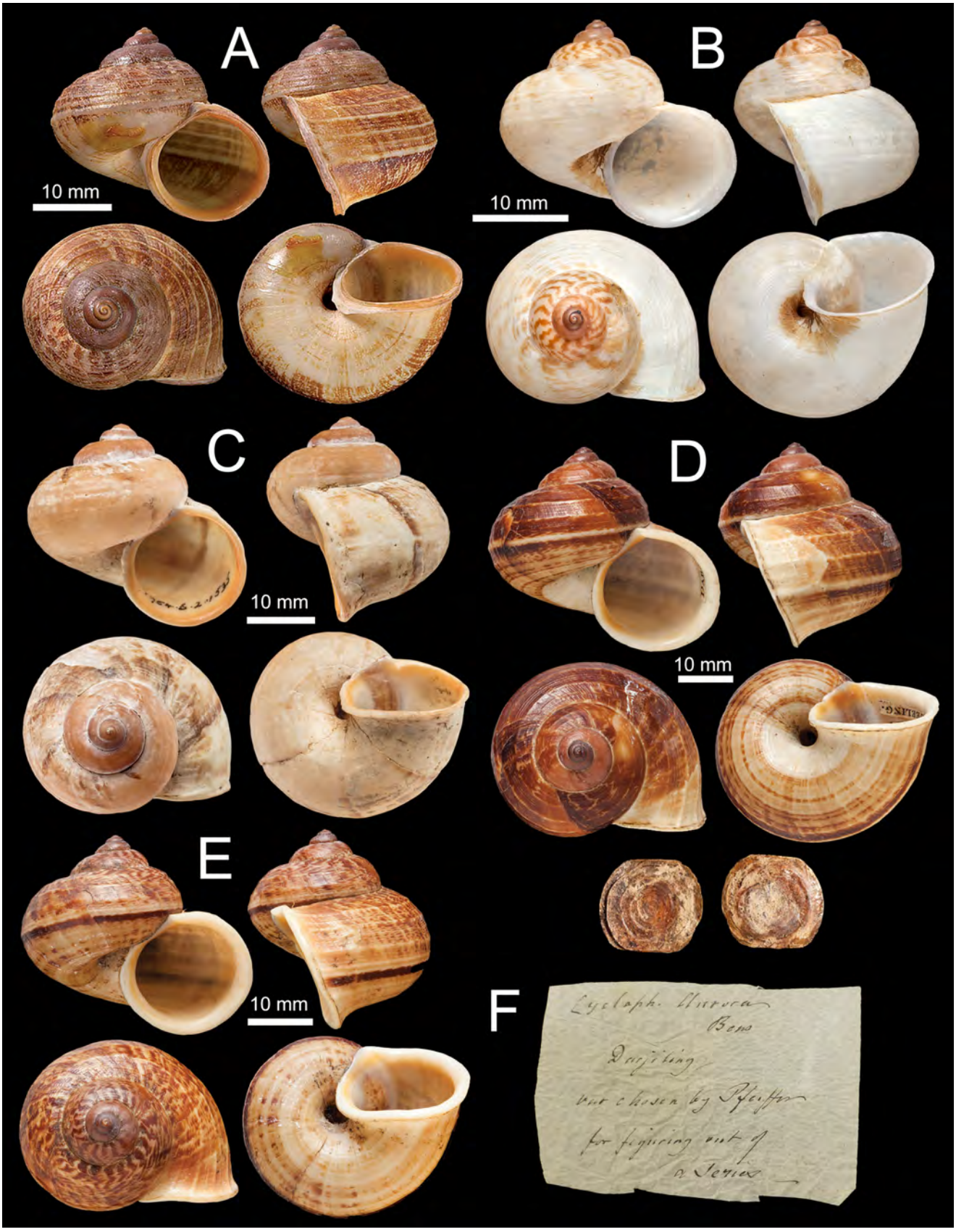


FIGURE 20. A. *Cyclophorus altivagus* Benson, 1854 (UMZC I.103835.A, neotype). **B.** *Cyclophorus exul* Benson, 1854 (UMZC I.103830, syntype). **C–F.** *Cyclostoma aurora* Benson, 1851 (C: NHMUK 1954.6.2.1535, holotype; D: UMZC I.103550.A, Benson collection; E: UMZC I.103555.A, Benson collection; F: label that accompanies E).

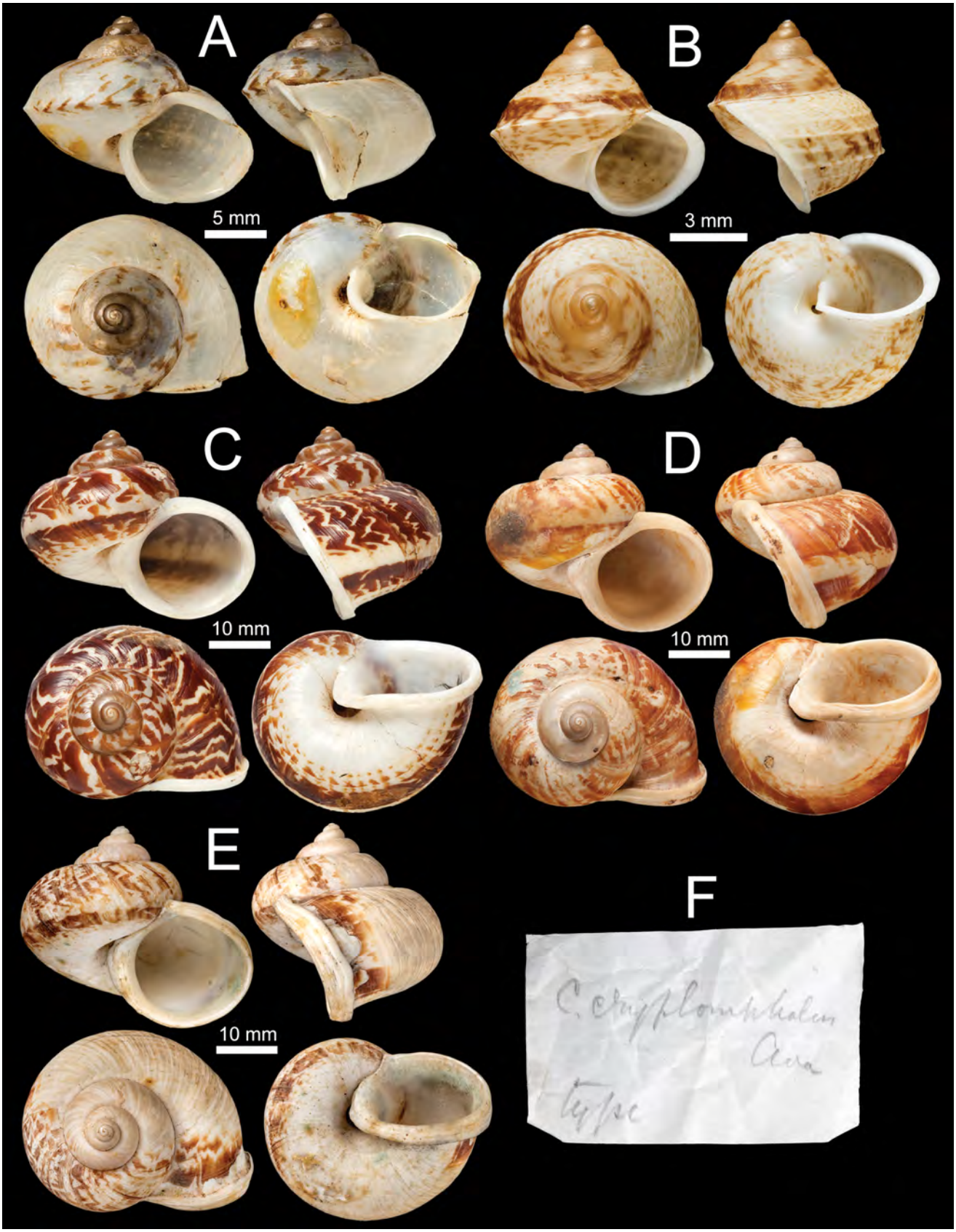


FIGURE 21. A–B. *Cyclophorus cybeus* Benson, 1857 (A: UMZC I.102610, holotype; B: UMZC I.102615, R. McAndrew collection). **C–F.** *Cyclophorus cryptomphalus* Benson, 1857 (C: NHMUK 20130114/1, neotype; D: UMZC I.102605, Benson collection; E: NHMUK 20190025, W.T. Blanford collection; F: label that accompanies E).

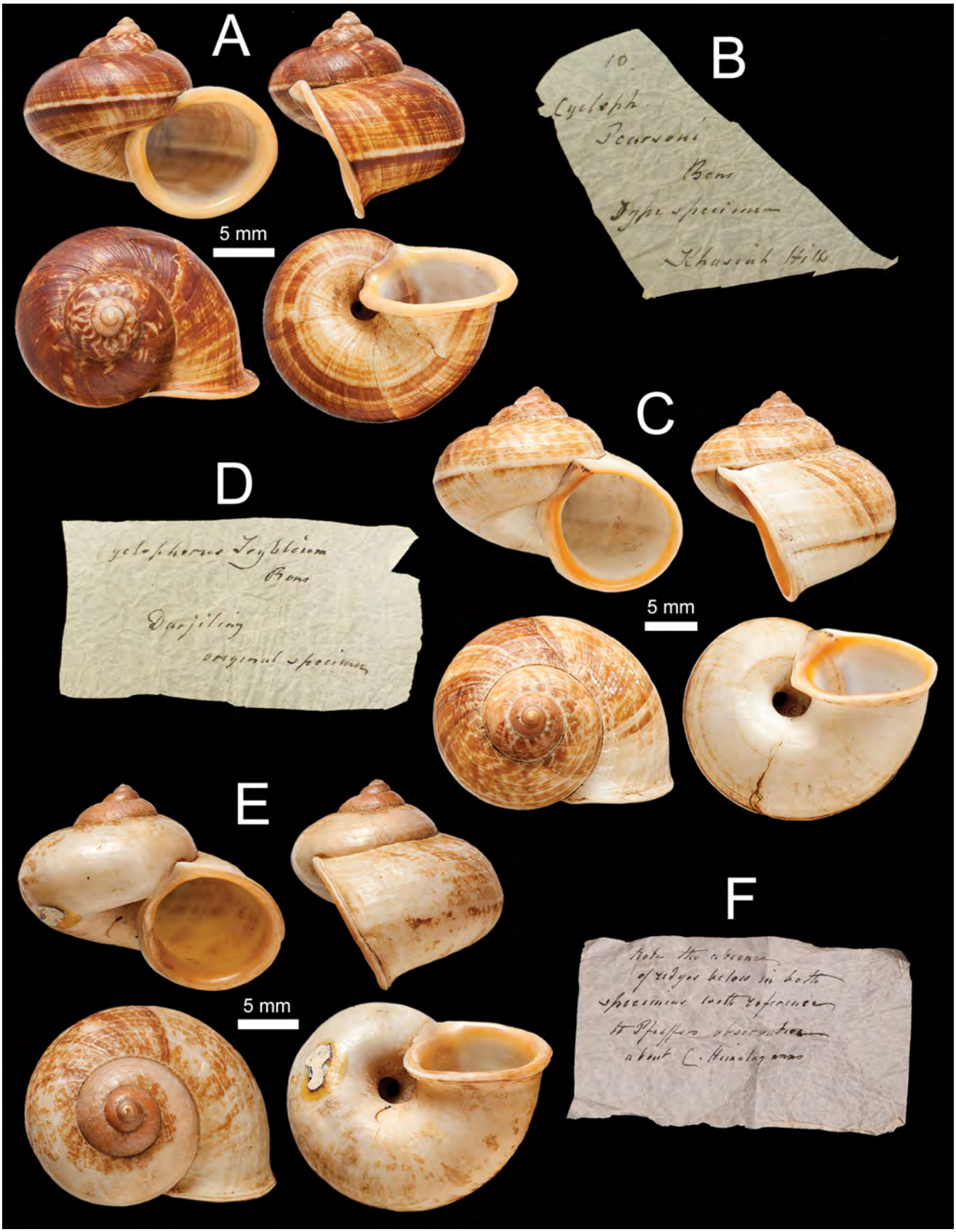


FIGURE 22. A–B. *Cyclostoma pearsoni* Benson, 1851 (A: UMZC I.103675, syntype; B: Benson's original label that accompanies A). **C–F.** *Cyclophorus tryblium* Benson, 1854 (C: UMZC I.103810, holotype; D: Benson's original label that accompanies E; UMZC I.103815.A, Benson collection; F. Benson's original label that accompanies E).

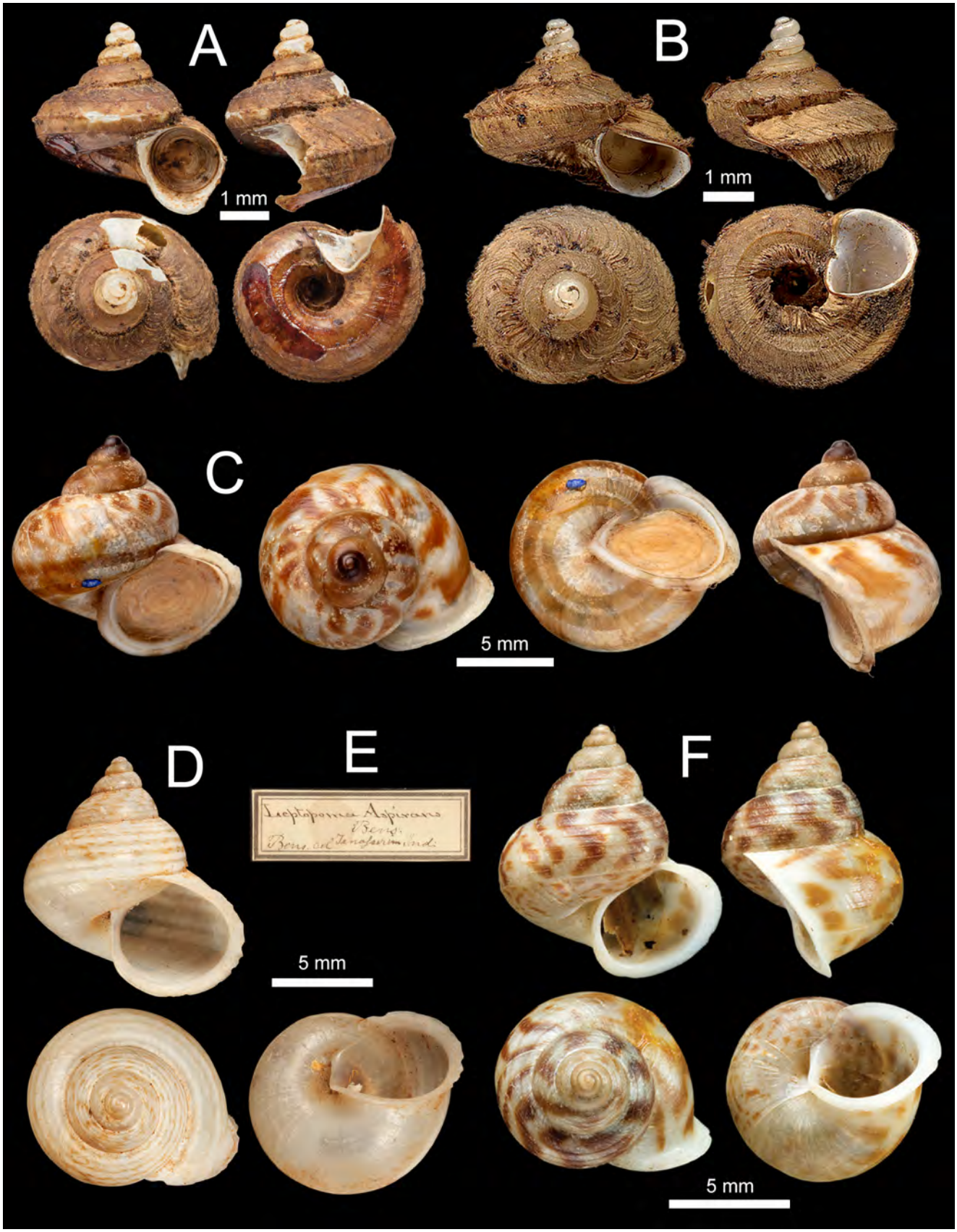


FIGURE 23. **A–B.** *Cyclostoma cuspidatum* Benson, 1851 (A: UMZC I.103720.A, lectotype; B: NHMUK 20110213/1, H.F. Blanford collection). **C.** *Leptopoma apicatum* Benson, 1856 (NHMUK 20190426/1, neotype). **D–F.** *Leptopoma aspirans* Benson, 1856 (D: UMZC I.102910.A, syntype; E: label that accompanies D; F: NHMUK 1888.12.4.858, Theobald collection).

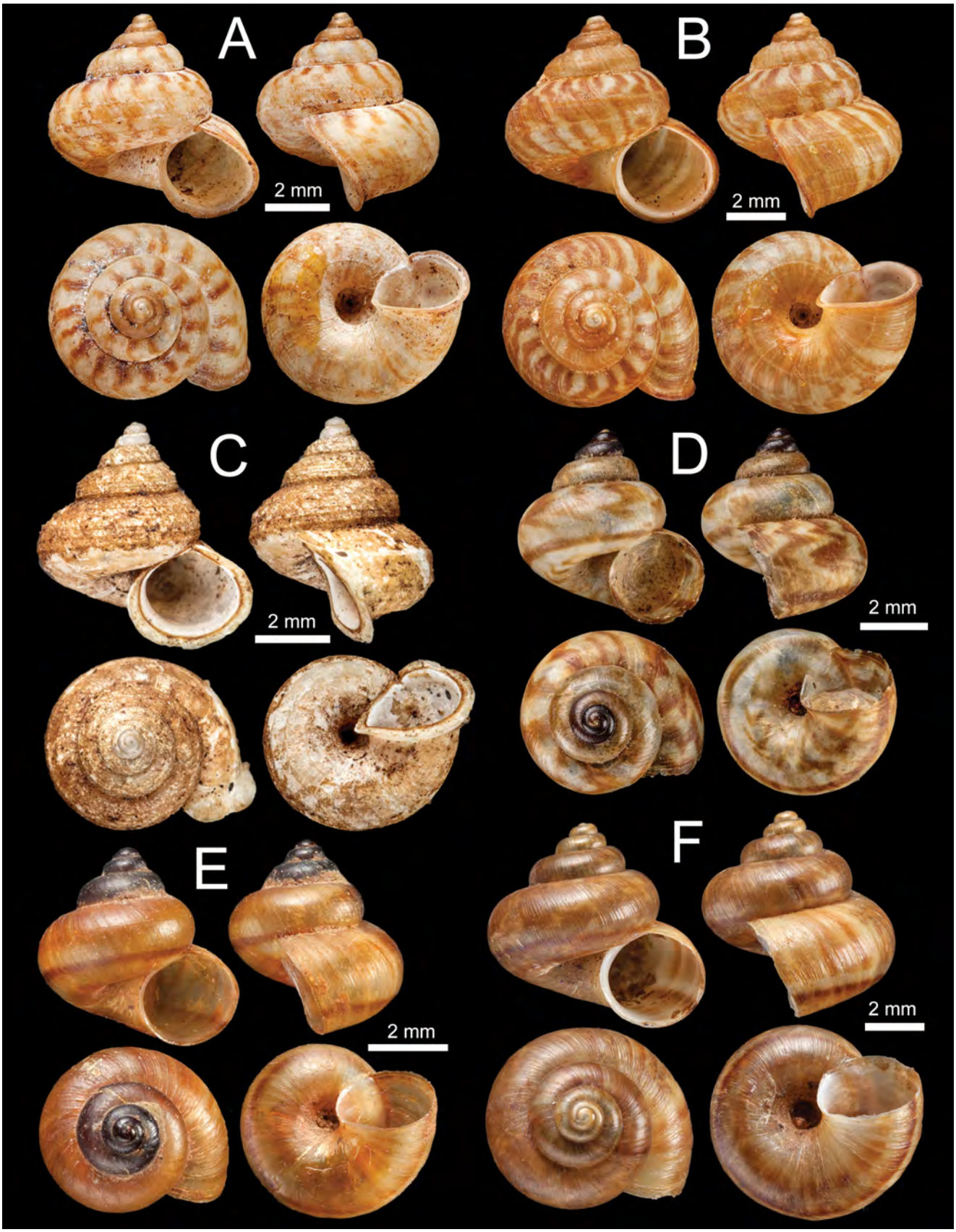


FIGURE 24. **A.** *Cyclophorus scissimargo* Benson, 1856 (UMZC I.102945.A, syntype). **B.** *Cyclostoma quadrifilosum* Benson, 1852 (UMZC I.104675.A, neotype). **C.** *Cyclophorus tomotrema* Benson, 1857 (NHMUK 1888.12.4.312-314, neotype). **D.** *Cyclostoma orophilum* Benson, 1853 (NHMUK 1850.5.8.6-9, neotype). **E–F.** *Cyclostoma halophilum* Benson, 1851 (E: UMZC I.103650.A, syntype; UMZC I.103651.A, Benson collection).

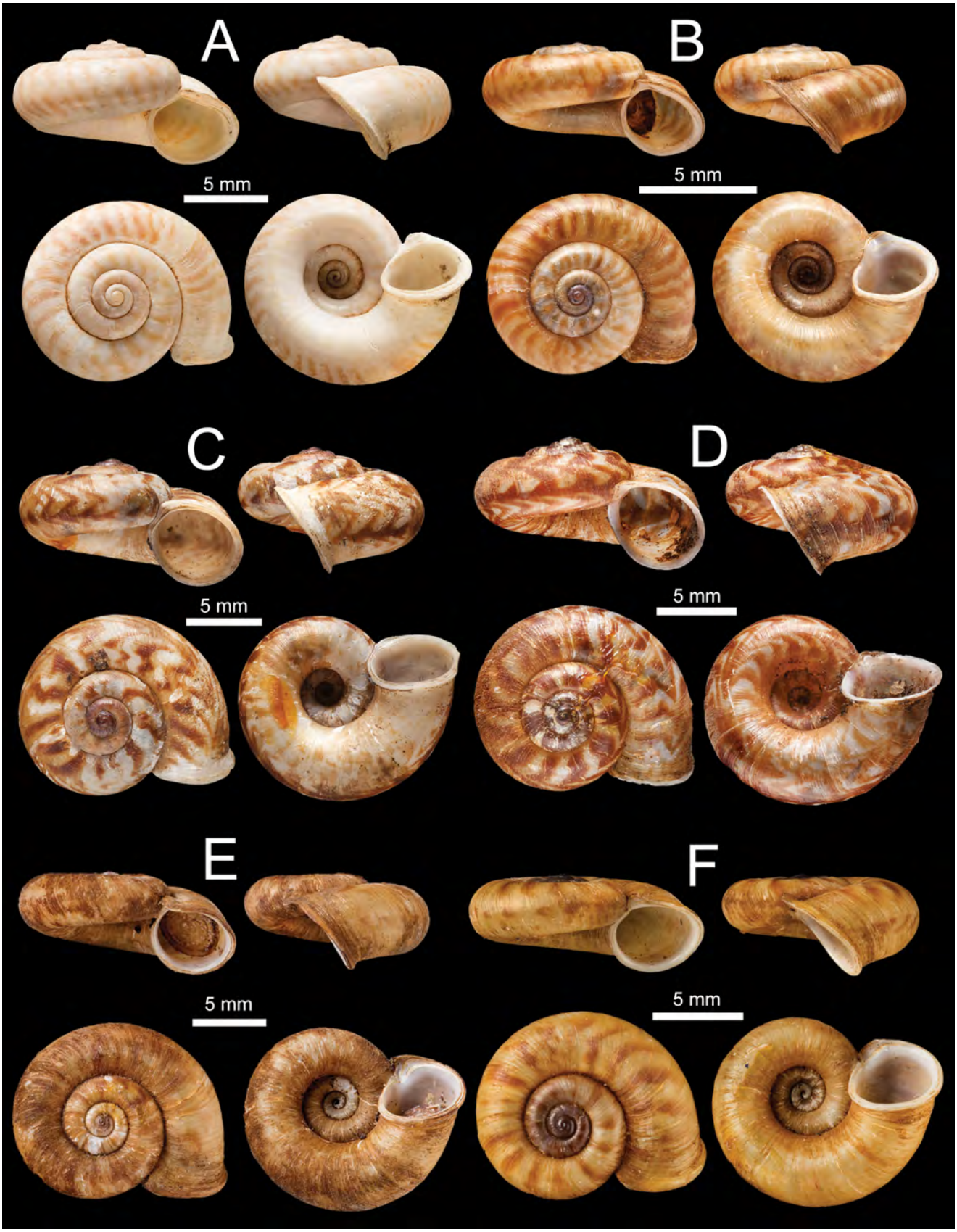


FIGURE 25. A–B. *Cyclophorus calyx* Benson, 1856 (A: UMZC I.102650.A, syntype; B: NHMUK 1954.6.2.1542, J.S. Hawkins collection). **C–D.** *Cyclostoma phaenotopicum* Benson, 1851 (C: UMZC I.103715.A, syntype; D: UMZC I.103715.C, Benson collection). **E–F.** *Cyclophorus pinnulifer* Benson, 1857 (E: UMZC I.102590.A, holotype; F: UMZC I.102590.B, Benson collection).

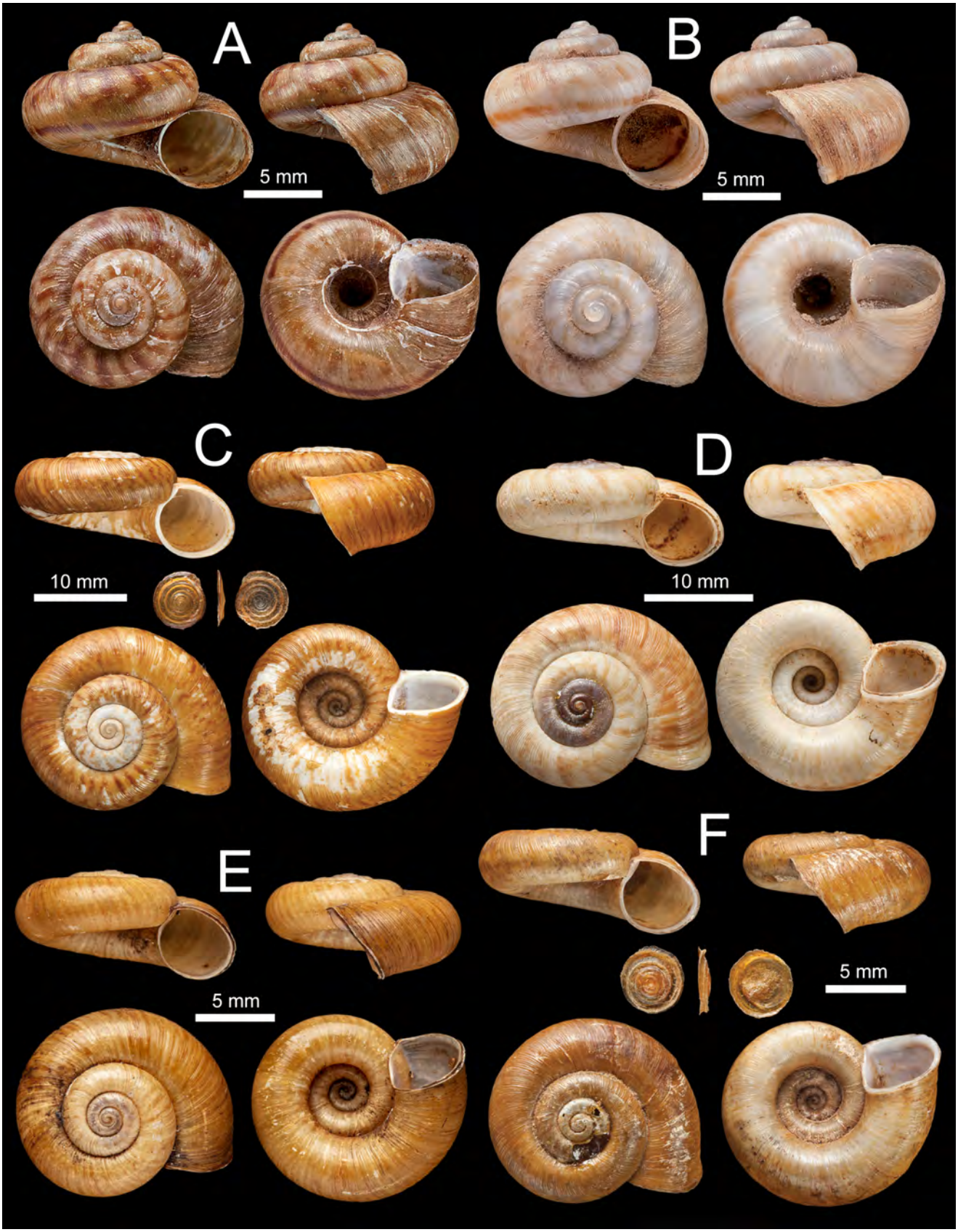


FIGURE 26. A–B. *Cyclostoma coeloconus* Benson, 1851 (A: UMZC I.103655.A, lectotype; B: UMZC I.103655.B, paralectotype). **C–D.** *Cyclophorus cratera* Benson, 1856 (C: NHMUK 1912.8.16.319, syntype with operculum; D: NHMUK 1954.6.2.1531, syntype). **E.** *Cyclophorus cadiscus* Benson, 1860 (NHMUK 1906.4.4.94, W.T. Blanford collection). **F.** *Cyclophorus cytopoma* Benson, 1860 (UMZC I.103280, syntype).

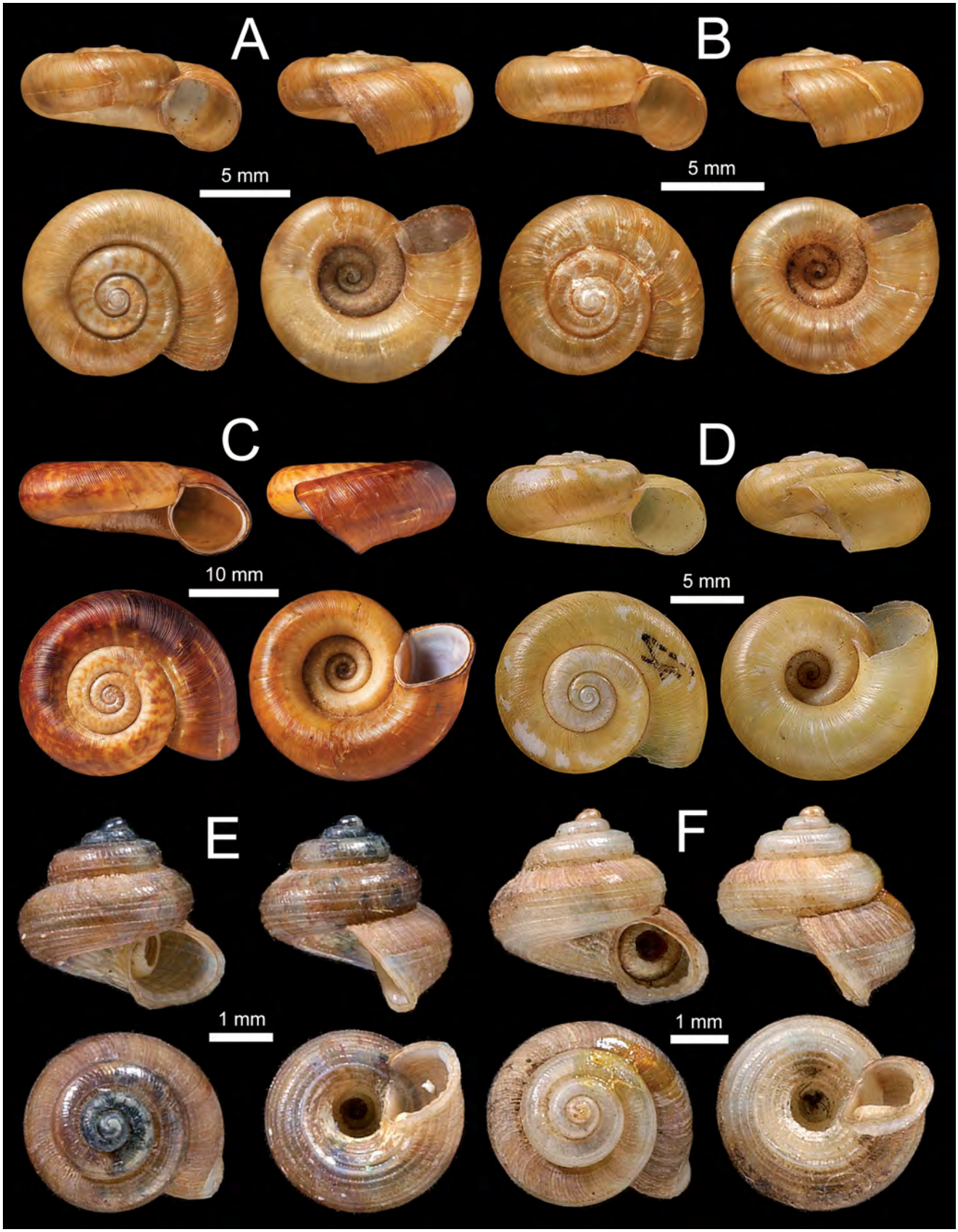


FIGURE 27. A–B. *Cyclophorus parapsis* Benson, 1853 (A: UMZC I.103980.A, syntype; B: UMZC I.103980.B, syntype). **C.** *Cyclophorus parma* Benson, 1856 (NHMUK 1912.8.16.321-322, syntype). **D.** *Cyclostoma ravidum* Benson, 1851 (UMZC I.103670, holotype). **E–F.** *Cyclostoma filocinctum* Benson, 1851 (E: UMZC I.103705.A, lectotype; F: UMZC I.103705.B, paralectotype).

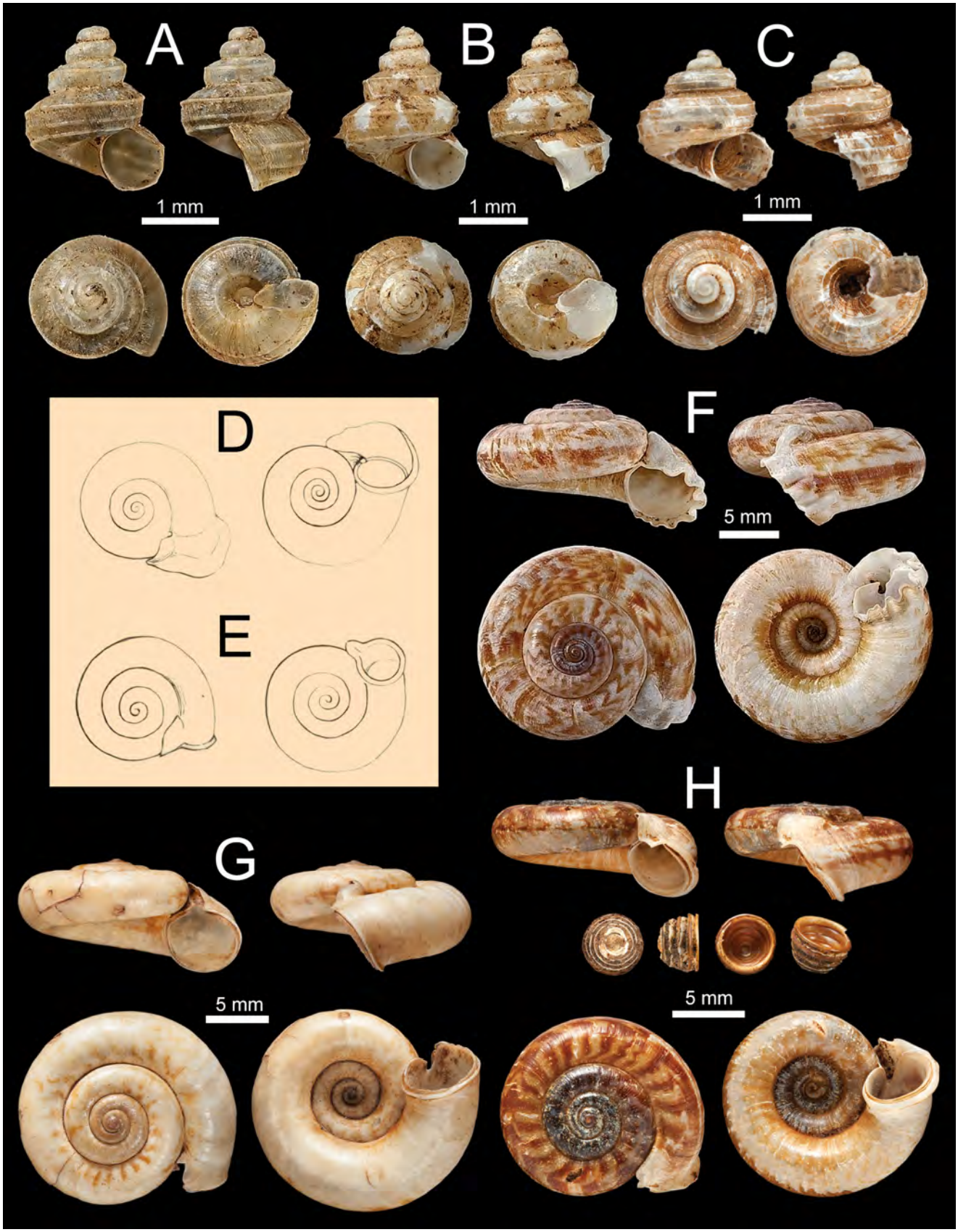


FIGURE 28. **A–B.** *Cyclostoma trochlea* Benson, 1852 (A: NHMUK 20110228/1, neotype; B: NHMUK 20110228/2, neotype lot). **C.** *Cyathopoma* ? *tignarium* Benson, 1863 (UMZC I.103390, holotype). **D.** *Pterocyclos blandi* Benson, 1851 (Benson, 1851d, Pl. 5, Fig. 1). **E.** *Pterocyclos troscheli* Benson, 1851 (Benson, 1851d, Pl. 5, Fig. 2). **F.** *Pterocyclos bilabiatus* Benson, 1835 (NHMUK 20110219/1, syntype). **G–H.** *Pterocyclos cingalensis* Benson, 1853 (G: UMZC I.103960.A, syntype; H: UMZC I.103960.B, syntype).

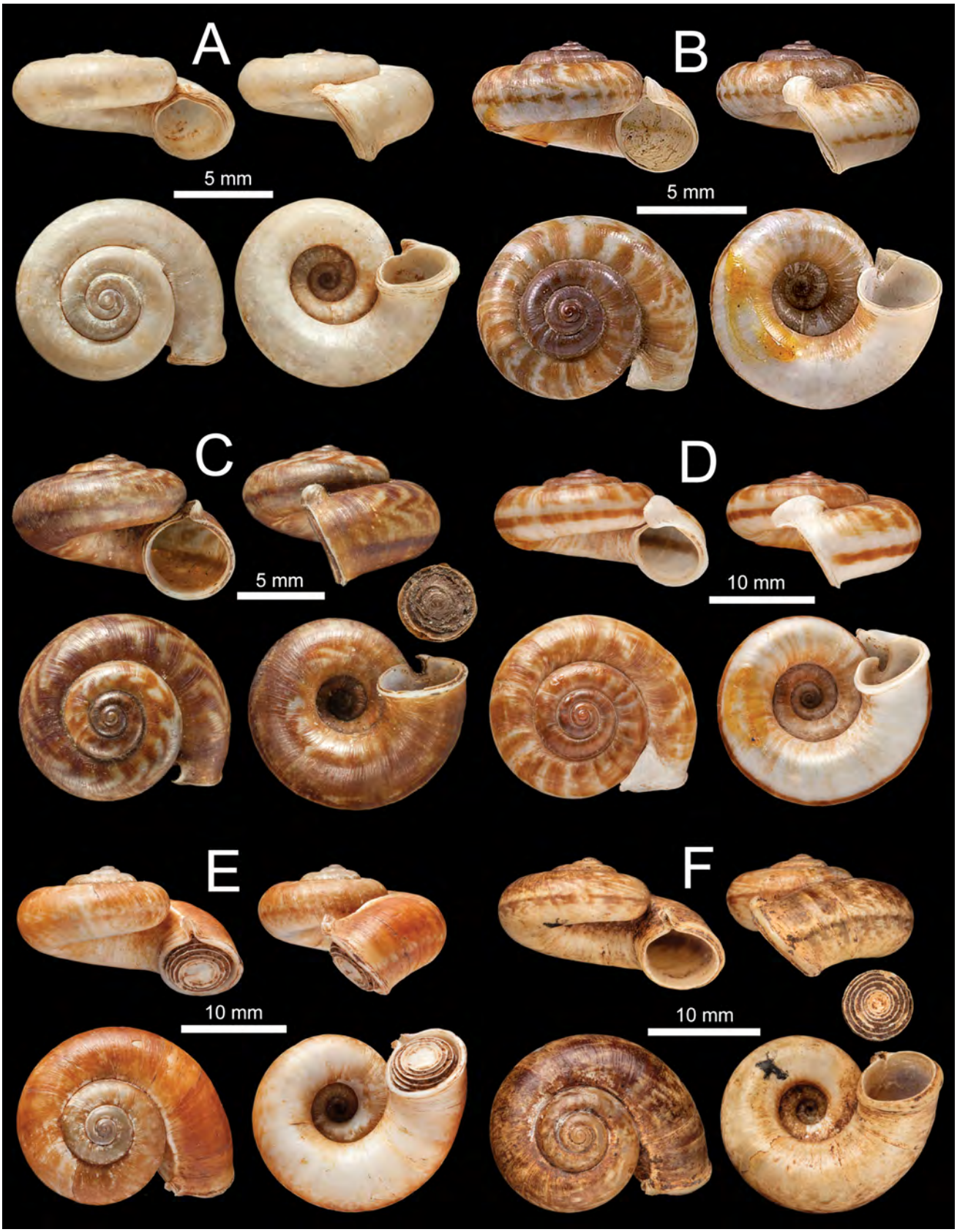


FIGURE 29. A. *Pterocyclos cetra* Benson, 1856 (UMZC I.102905.A, syntype). **B.** *Pterocyclos nanus* Benson, 1851 (UMZC I.103695, lectotype). **C.** *Pterocyclos pullatus* Benson, 1856 (UMZC I.103050, syntype). **D.** *Pterocyclos rupestris* Benson, 1832 (UMZC I.102070.A, neotype). **E–F.** *Rhiostoma haughtoni* Benson, 1860 (E: UMZC I.103445.A, lectotype; F: NHMUK 1888.12.4.1985-1986, Theobald collection).

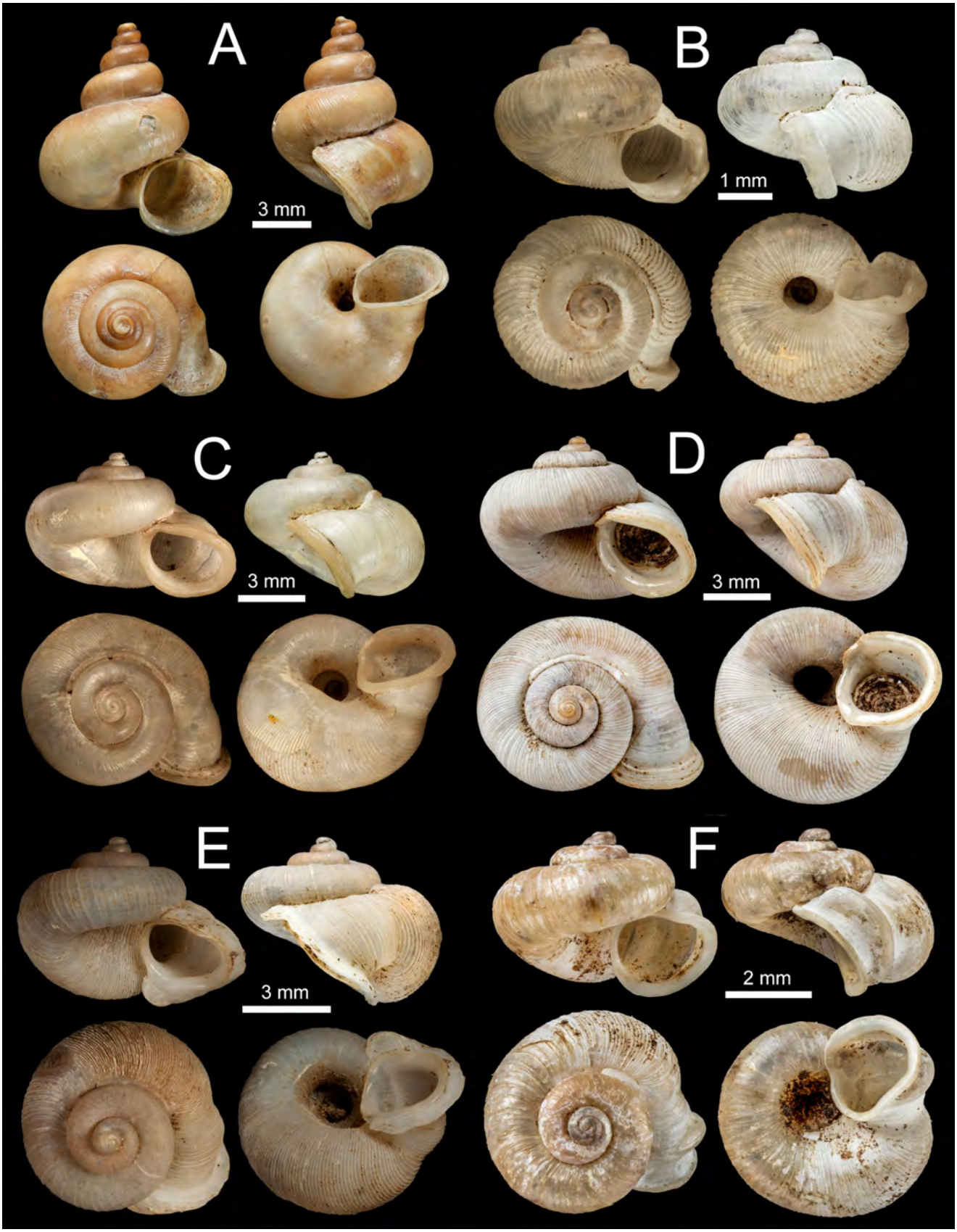


FIGURE 30. **A.** *Alycaeus pyramidalis* Benson, 1856 (UMZC I.102830.A, Benson collection). **B.** *Alycaeus crenulatus* Benson, 1859 (UMZC I.102690, syntype). **C–D.** *Alycaeus physis* Benson, 1859 (A: UMZC I.102735, syntype; B: NHMUK 1906.4.4.64/1, W. Blanford collection). **E.** *Alycaeus prosectus* Benson, 1857 (UMZC I.102775.A, syntype). **F.** *Alycaeus stylifer* Benson, 1857 (UMZC I.102630.A, holotype).

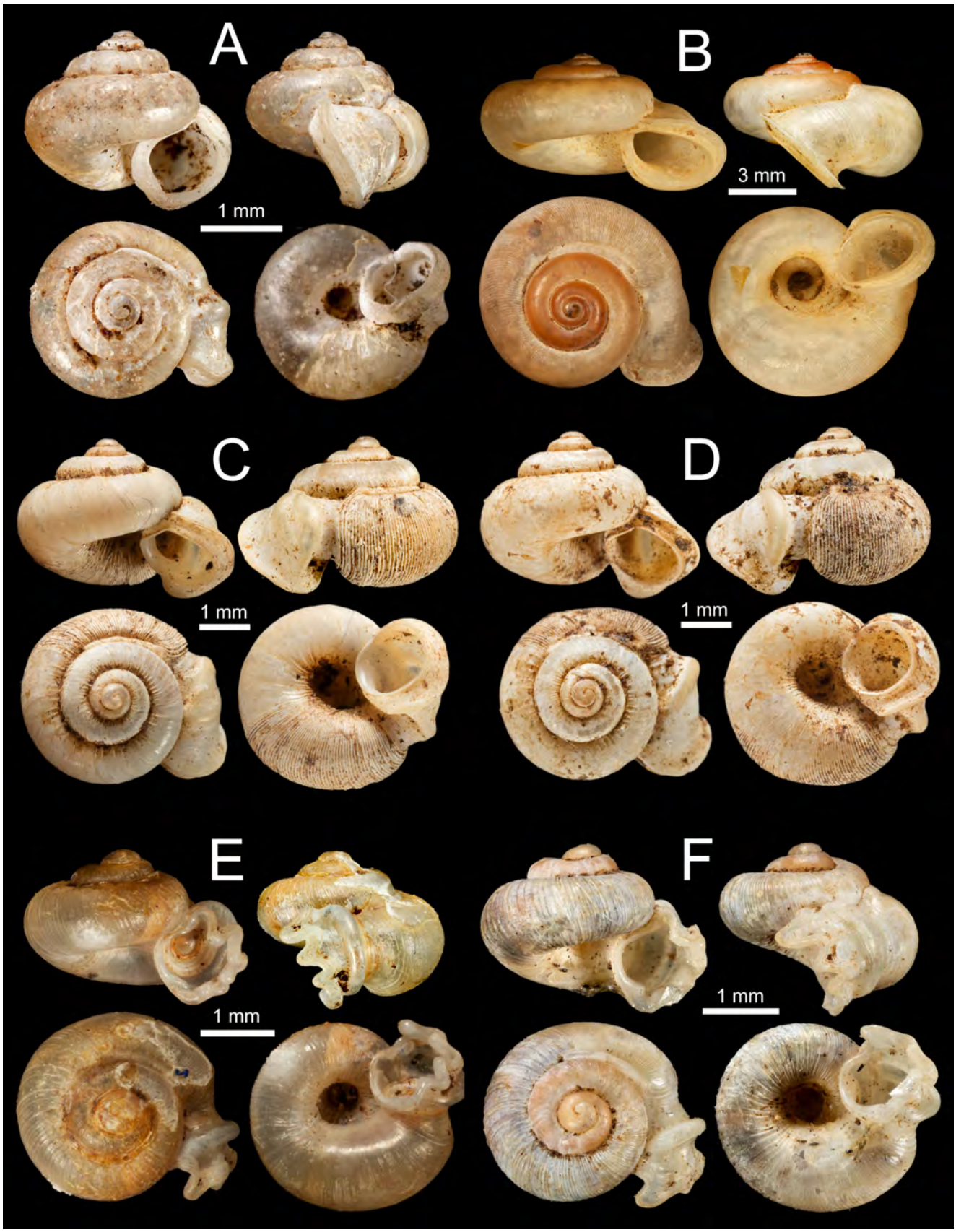


FIGURE 31. **A.** *Alycaeus gemmula* Benson, 1859 (NHMUK 1906.4.4.55, holotype). **B.** *Alycaeus umbonalis* Benson, 1856 (UMZC I.103005.A, syntype). **C–D.** *Alycaeus hebes* Benson, 1857 (C: NHMUK 1888.12.4.909, neotype; D: NHMUK 1888.120.4.910, Theobald collection). **E–F.** *Alycaeus plectocheilus* Benson, 1859 (E: UMZC I.102745.A, syntype; F: NHMUK 1906.4.4.184/1, syntype).

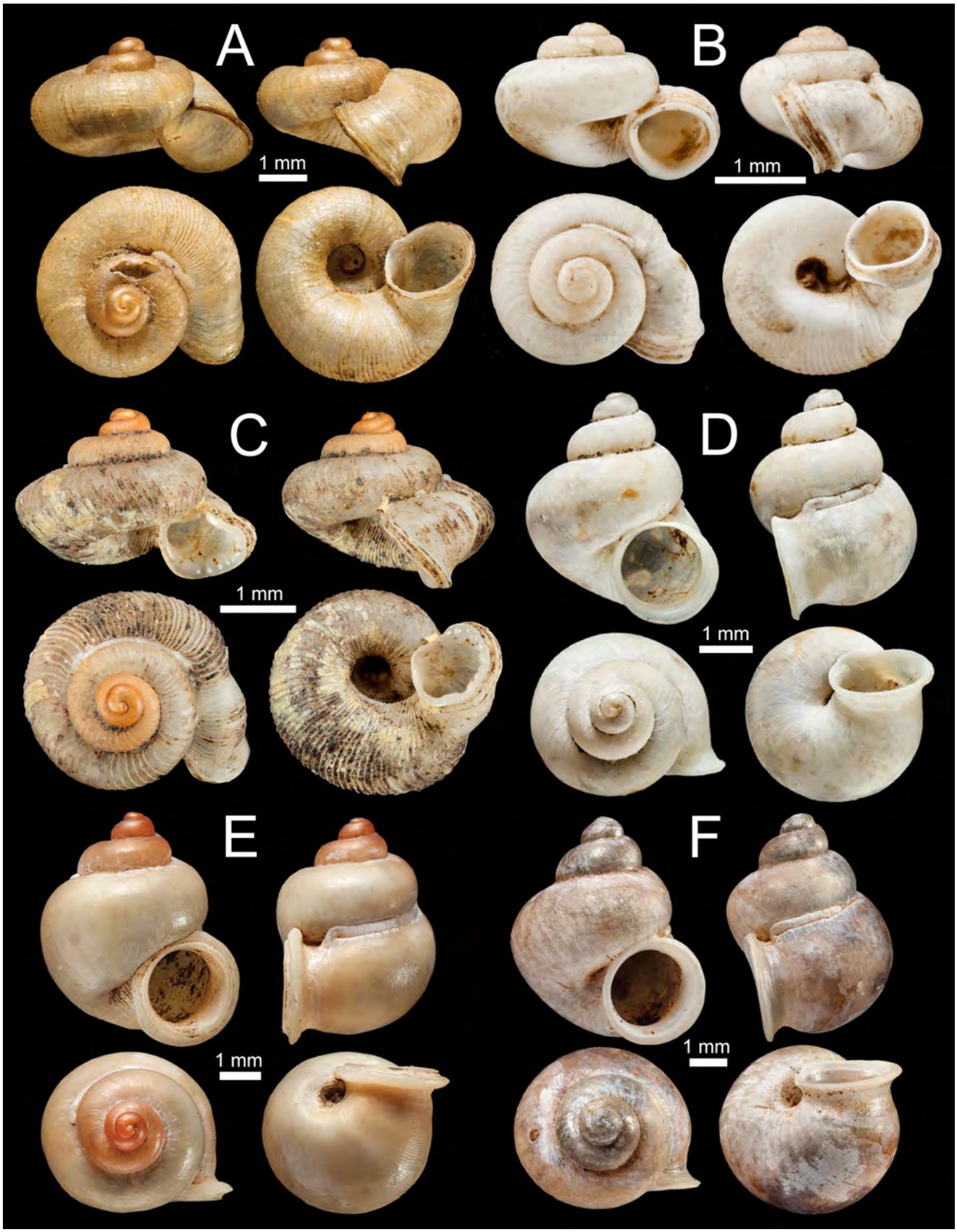


FIGURE 32. **A.** *Alycaeus andamaniae* Benson, 1861 (UMZC I.103175, holotype). **B.** *Alycaeus armillatus* Benson, 1856 (UMZC I.102995, holotype). **C.** *Alycaeus sculptilis* Benson, 1856 (UMZC I.102845.A, neotype). **D.** *Alycaeus urnula* Benson, 1853 (UMZC I.103780.A, syntype). **E–F.** *Alycaeus amphora* Benson, 1856 (E: UMZC I.102850, syntype; F: NHMUK 1906.5.5.23/1, figured W.T. Blanford collection).

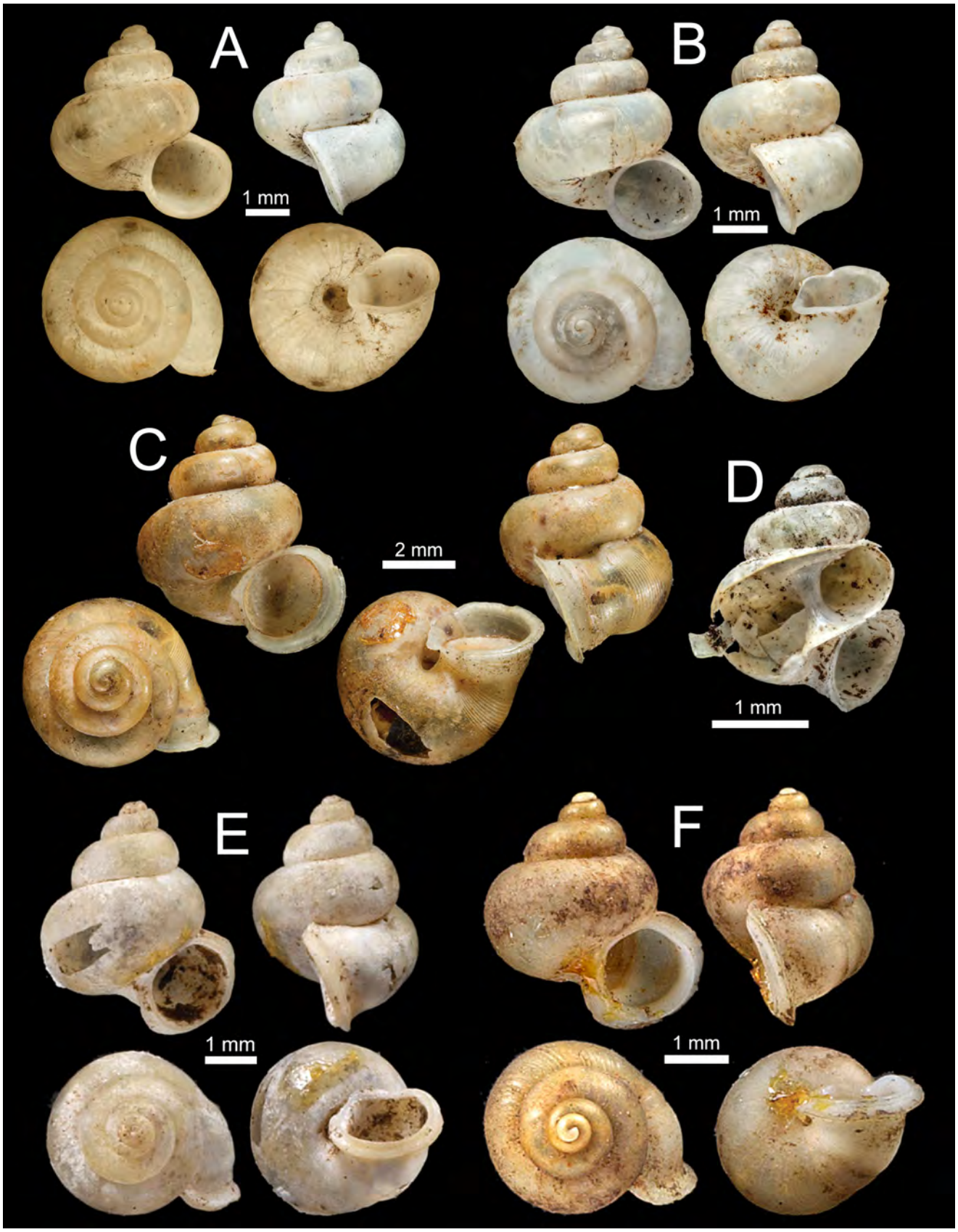


FIGURE 33. **A–B.** *Alycaeus bembex* Benson, 1859 (A: UMZC I.102730, syntype; B: NHMUK 1906.4.4.44/1, W.T. Blanford collection). **C.** *Cyclostoma constrictum* Benson, 1851 (UMZC I.103745, holotype). **D.** *Cyclostoma constrictum* var. *minor* Benson, 1859 (NHMUK 1860.6.27.26, syntype). **E–F.** *Alycaeus otiphorus* Benson, 1859 (E: UMZC I.102555, syntype; F: UMZC I.102560, McAndrew collection).

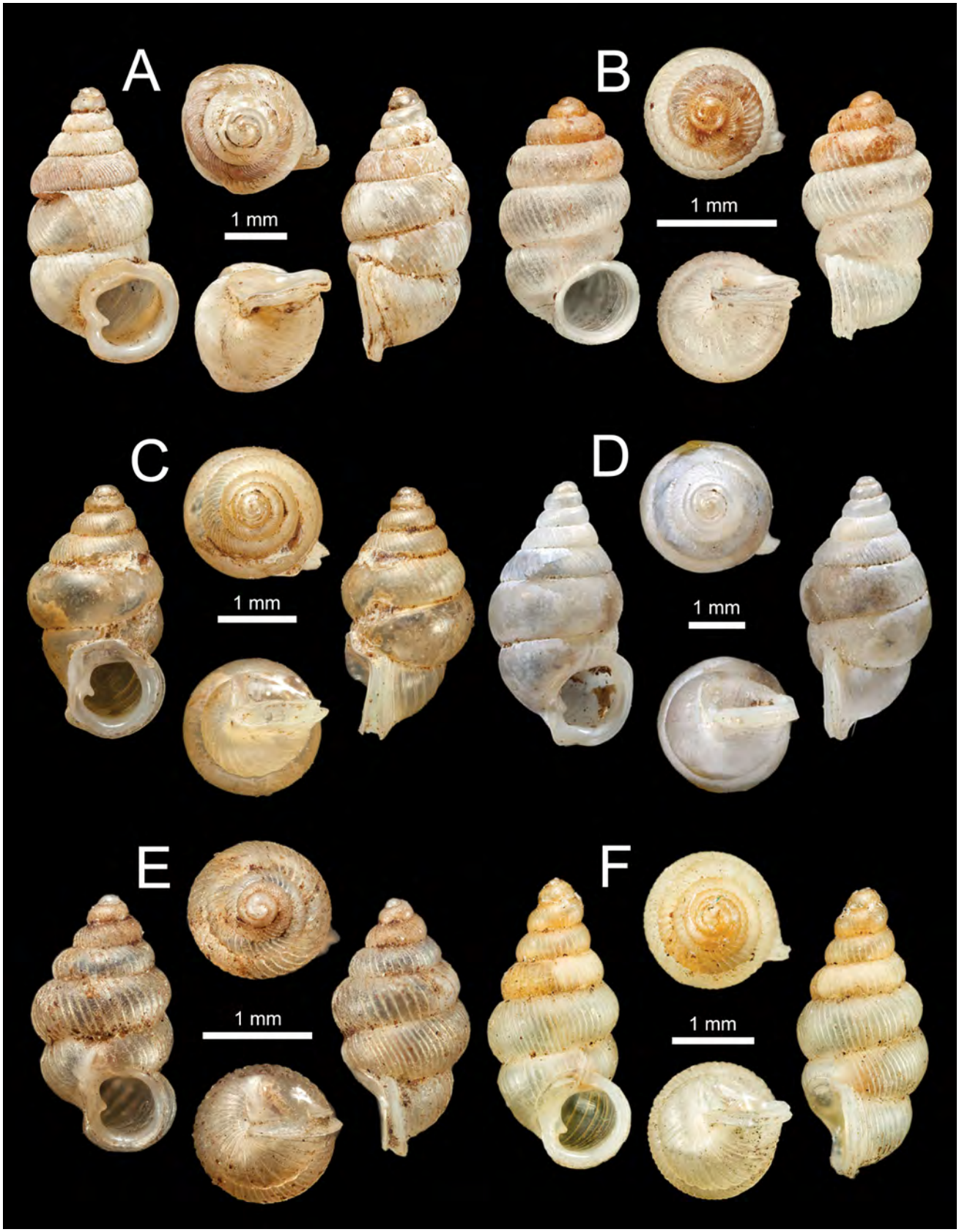


FIGURE 34. **A.** *Diplommatina blanfordiana* Benson, 1860 (UMZC I.103335.A, syntype). **B.** *Diplommatina costulatum* Benson, 1849 (UMZC I.102340.A, syntype). **C.** *Diplommatina diplocheilus* Benson, 1857 (UMZC I.102625.A, syntype). **D.** *Diplommatina pachycheilus* Benson, 1857 (UMZC I.102595.A, neotype). **E.** *Diplommatina polypleuris* Benson, 1857 (UMZC I.102645). **F.** *Diplommatina pullula* Benson, 1859 (UMZC I.102525, syntype).

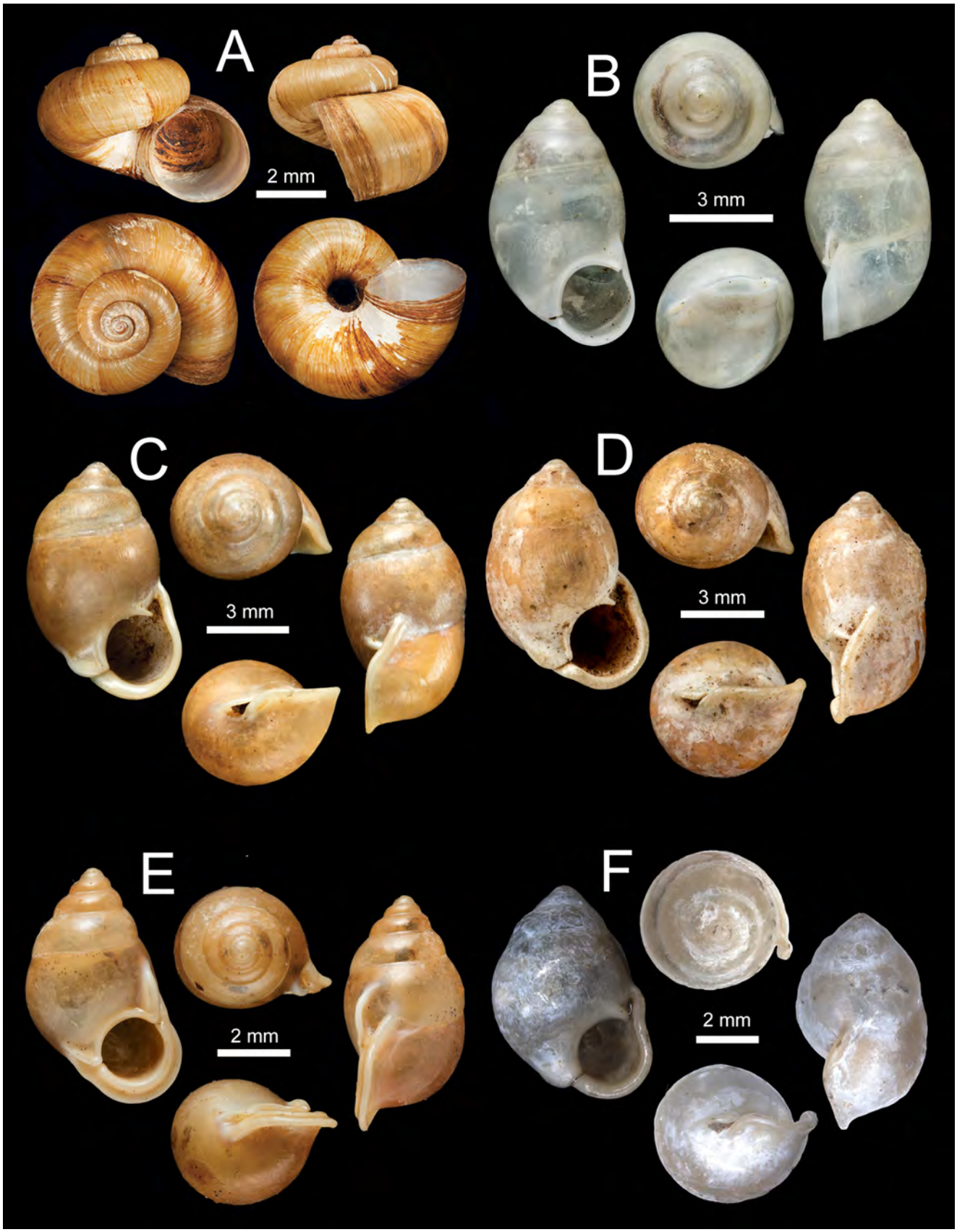


FIGURE 35. **A.** *Cyclostoma wahlbergi* Benson, 1852 (UMZC I.103820.A, neotype). **B.** *Pupina artata* Benson, 1856 (UMZC I.102960.A, syntype). **C–D.** *Pupina arula* Benson, 1856 (C: UMZC I.103025, syntype; D: NHMUK 1888.12.4.109, Theobald collection). **E.** *Pupina imbricifera* Benson, 1856 (UMZC I.102835.A, syntype). **F.** *Pupina peguensis* Benson, 1860 (NZSI M.32940/9, lectotype).

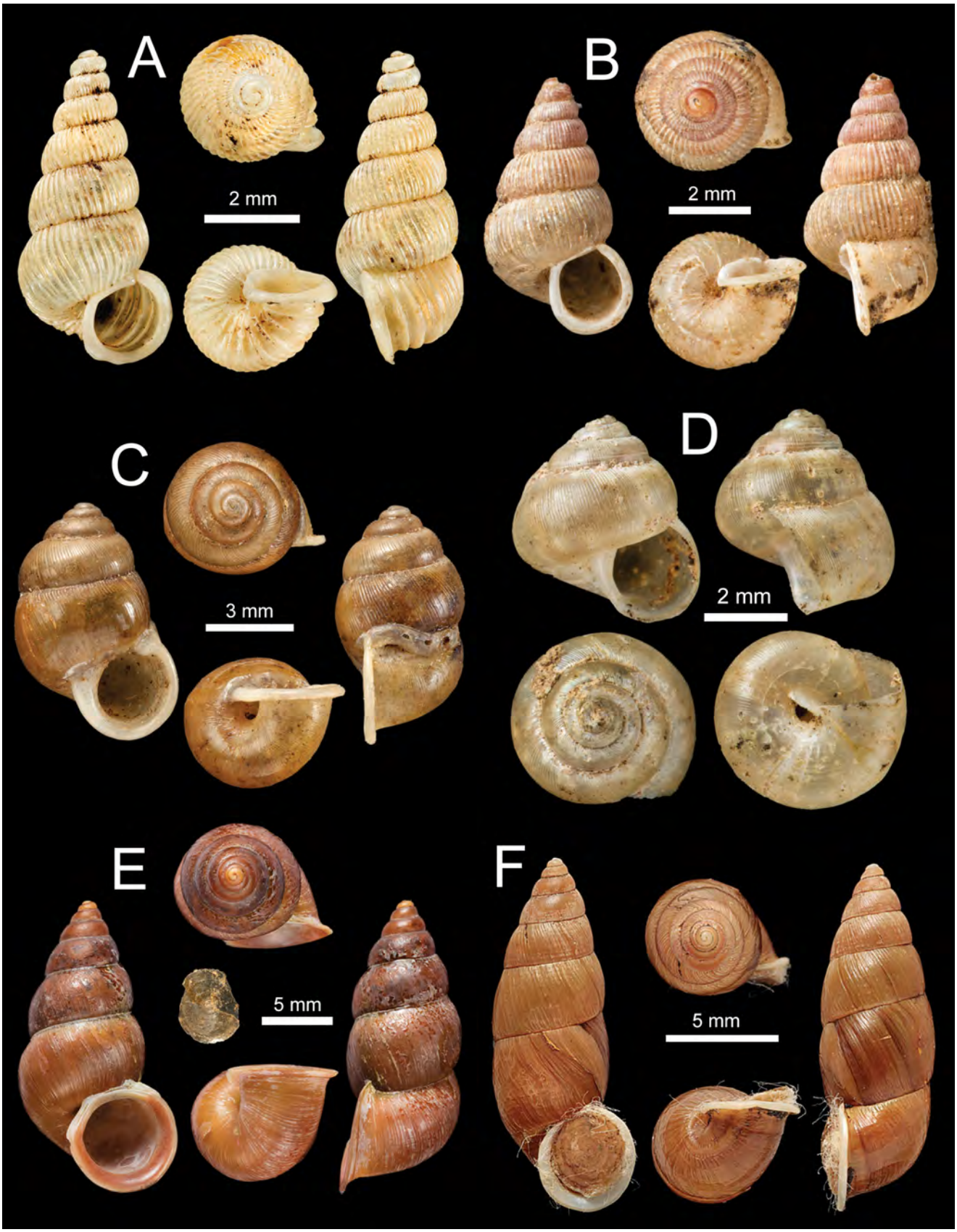


FIGURE 36. **A.** *Pomatias himalayae* Benson, 1859 (UMZC I.102695.A, neotype). **B.** *Bulimus pleurophorus* Benson, 1857 (NHMUK 1888.12.4.329, holotype). **C.** *Streptaulus blanfordi* Benson, 1857 (UMZC I.102675.A, syntype). **D.** *Helix calpis* Benson, 1859 (NHMUK 1860.6.27.11, W.T. Blanford collection). **E.** *Cyclostoma anostoma* Benson, 1852 (UMZC I.104040.A, holotype). **F.** *Cyclostoma funiculalum* Benson, 1838 (UMZC I.102140.A, lectotype).

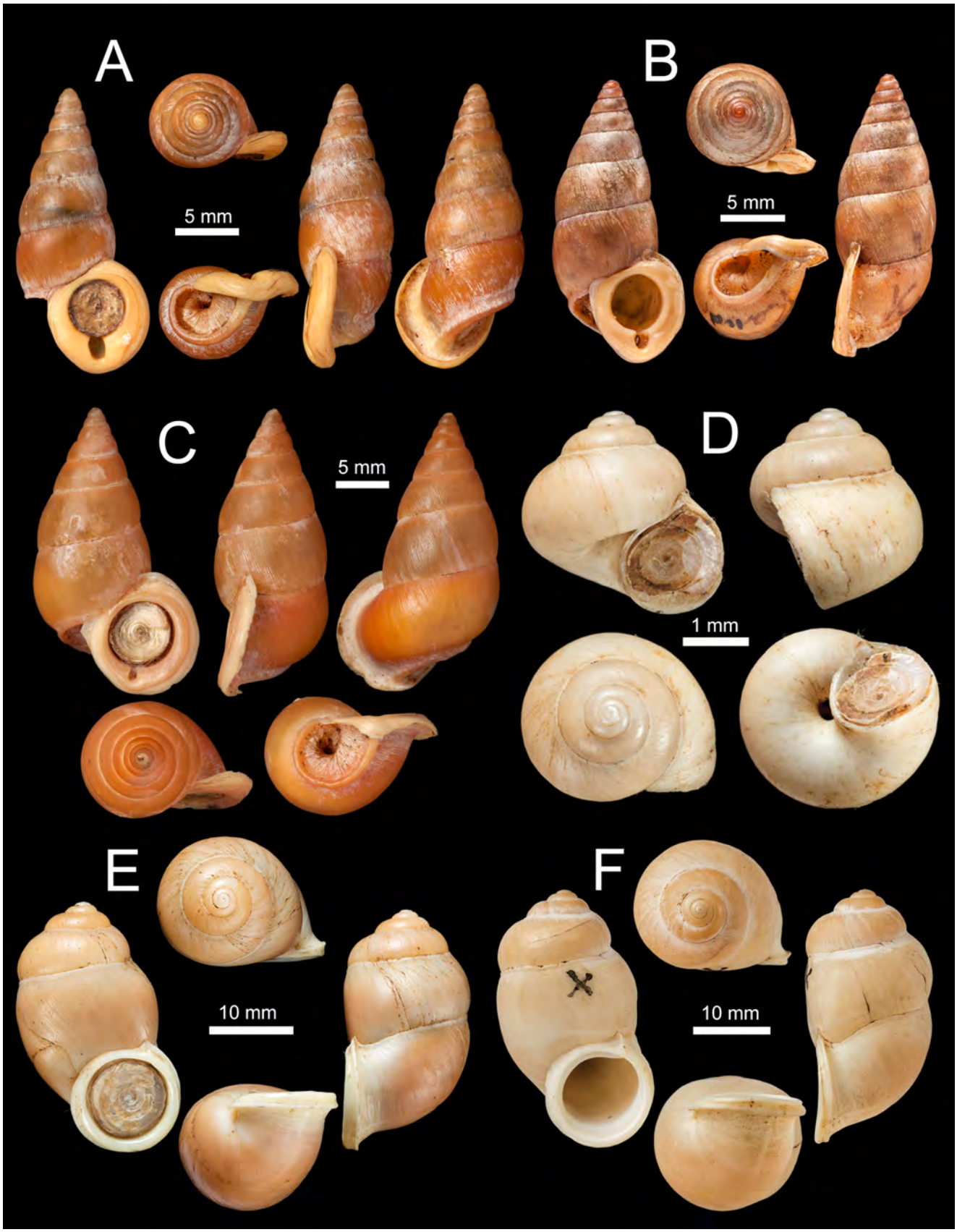


FIGURE 37. **A.** *Cataulus decorus* Benson, 1853 (NHMUK 1912.8.16.307-309). **B.** *Cataulus colletti* Sykes 1898 ['*decorus*'] (UMZC I.103942). **C.** *Cataulus austenianus* Benson, 1853 (NHMUK 1912.8.16.310-312). **D.** *Otopoma blennus* Benson, 1856 (UMZC I.102930.A). **E–F.** *Megalomastoma gravidum* Benson, 1856 (E: NHMUK 1888.12.4.863, neotype; F: UMZC I.102935.A, Benson collection).

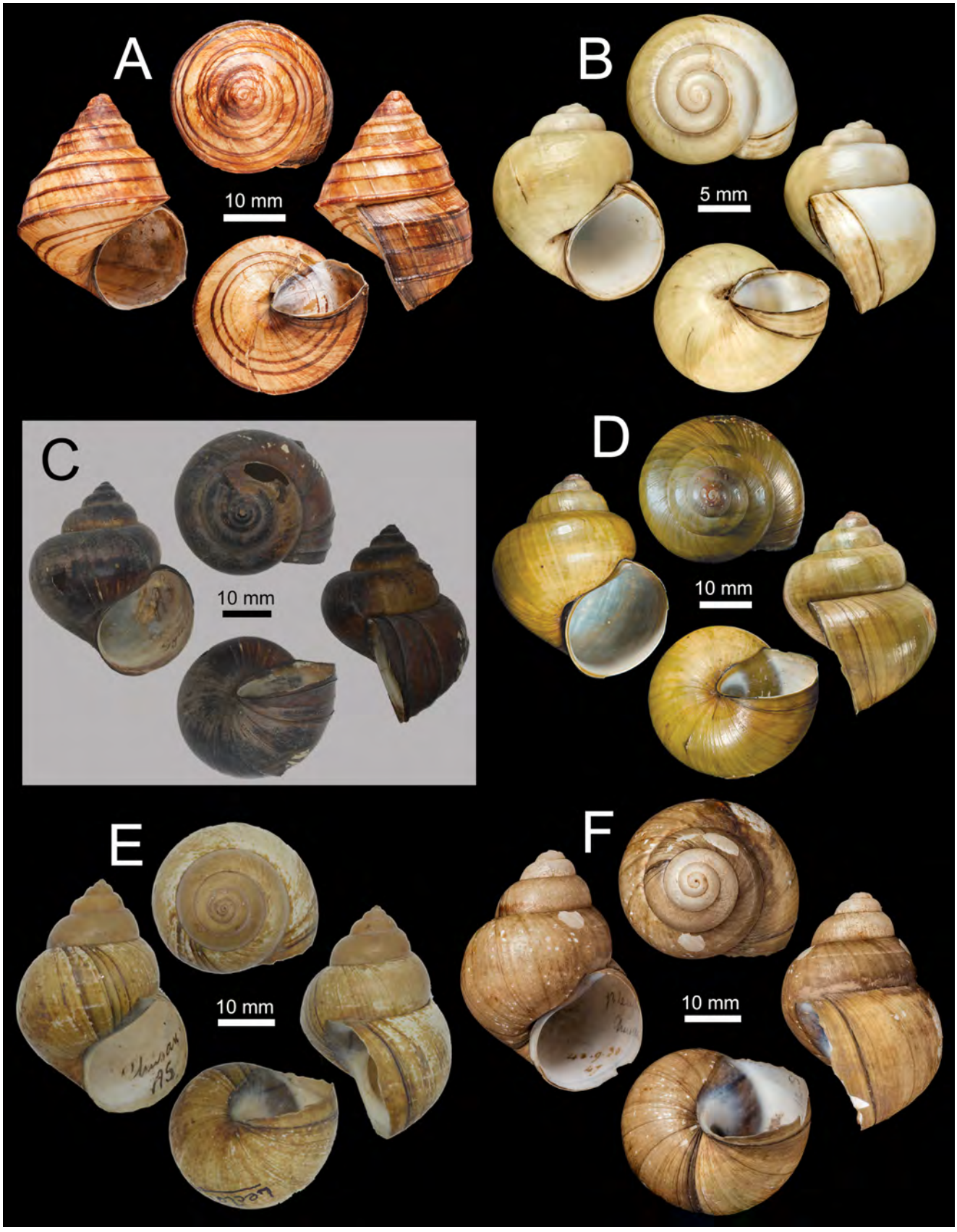


FIGURE 38. **A.** *Paludina oxytropis* Benson, 1836 (NHMUK 1879.12.26.120). **B.** *Paludina crassa* Benson, 1836 (NHMUK 1954.6.2.720, Benson collection). **C–D.** *Paludina lecythis* Benson, 1836 (C: NZSI M.2300, syntype; D: UMZC I.102210, Benson collection). **E–F.** *Paludina lecythoides* Benson, 1842 (E: NZSI M.2332, lectotype; F: NHMUK 1842.9.30.47, paralectotype).

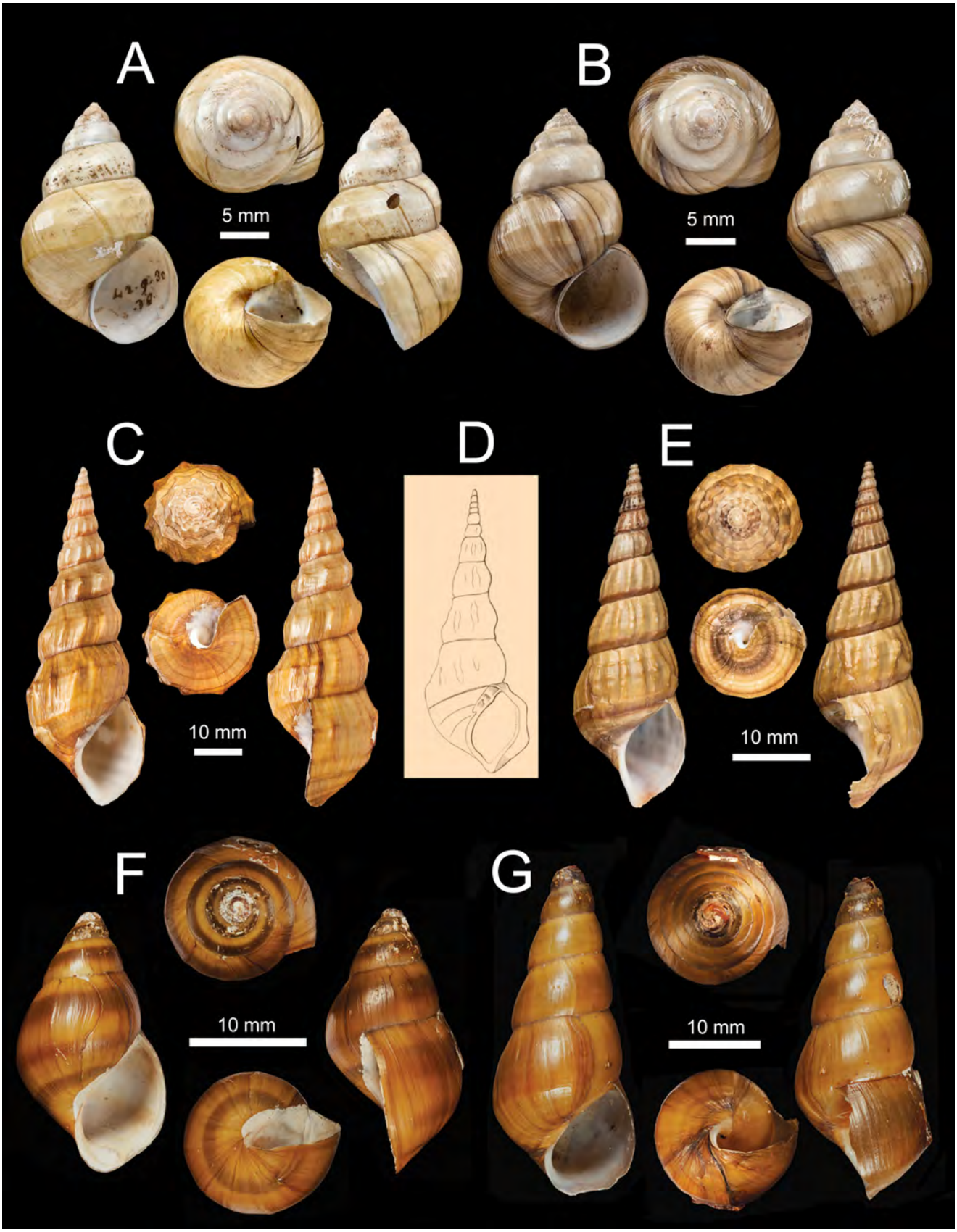


FIGURE 39. **A–B.** *Paludina quadrata* Benson, 1842 (A: NHMUK 1842.9.30.34-44, syntype; B: NHMUK 1842.9.30.34-44, syntype). **C–E.** *Melania variabilis* Benson, 1836 (C: NHMUK 1872.12.2.2, lectotype; D: Benson's figure from *Gleanings in Science*; E: NHMUK 1954.6.2.3, paralectotype). **F.** *Melania zonata* Benson, 1836 (UMZC I.102250, Benson collection). **G.** *Melania terebra* Benson, 1836 (UMZC I.102230, Benson collection).

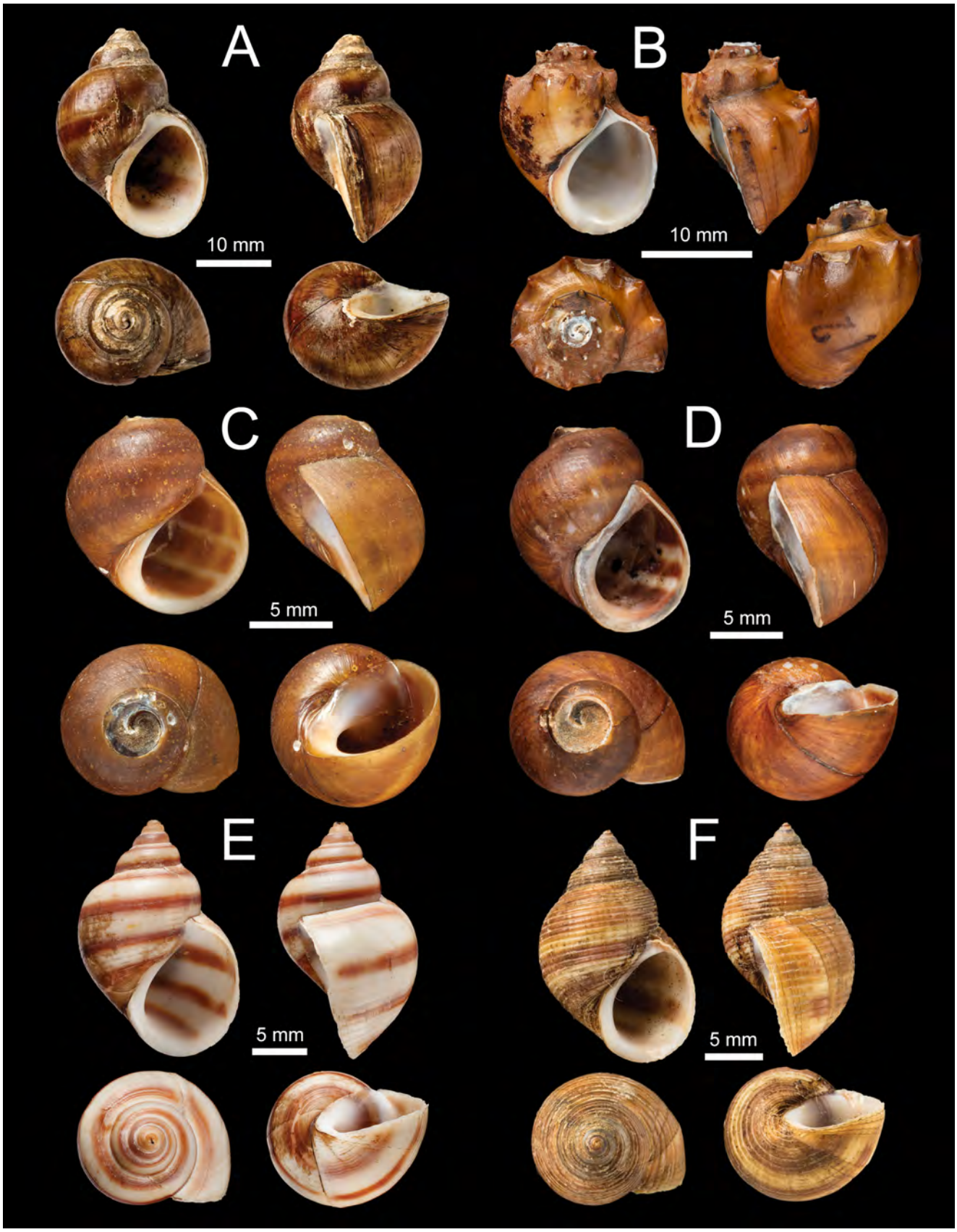


FIGURE 40. **A.** *Paludomus ornata* Benson, 1856 (NHMUK 1888.12.4.1890-1891, neotype). **B.** *Melania stephanus* Benson, 1836 (NHMUK 1841.7.23.30, lectotype). **C–D.** *Paludomus labiosa* Benson, 1856 (C: UMZC I.102840.A, syntype; D: NHMUK 1888.12.4.1892, Theobald collection). **E–F.** *Paludomus regulata* Benson, 1856 (E: UMZC I.102900.A, syntype; F: NHMUK 1888.12.4.1878, Theobald collection).

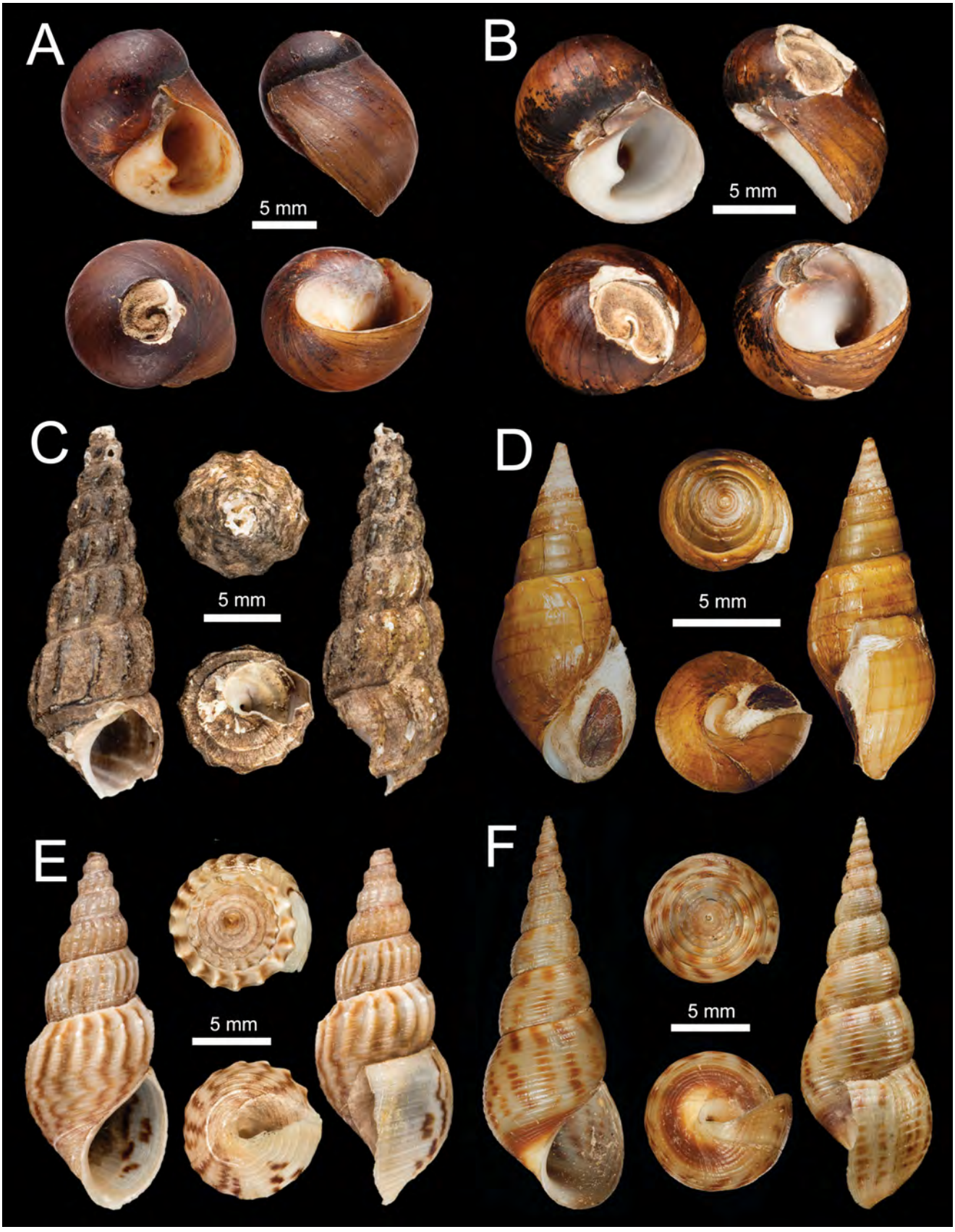


FIGURE 41. **A–B.** *Tanalia*? *stomatodon* Benson, 1862 (A: UMZC I.103250.A, syntype; B: NHMUK 1872.7.10.4/1, syntype). **C.** *Melania cancellata* Benson, 1842 (NHMUK 20190436/1, syntype). **D.** *Melania lirata* Benson, 1836 (UMZC I.102265.A, syntype). **E.** *Melania elegans* Benson, 1836 (NHMUK 1872.12.2.1, syntype). **F.** *Melania pyramis* Benson, 1837 (UMZC I.103640, Benson collection).

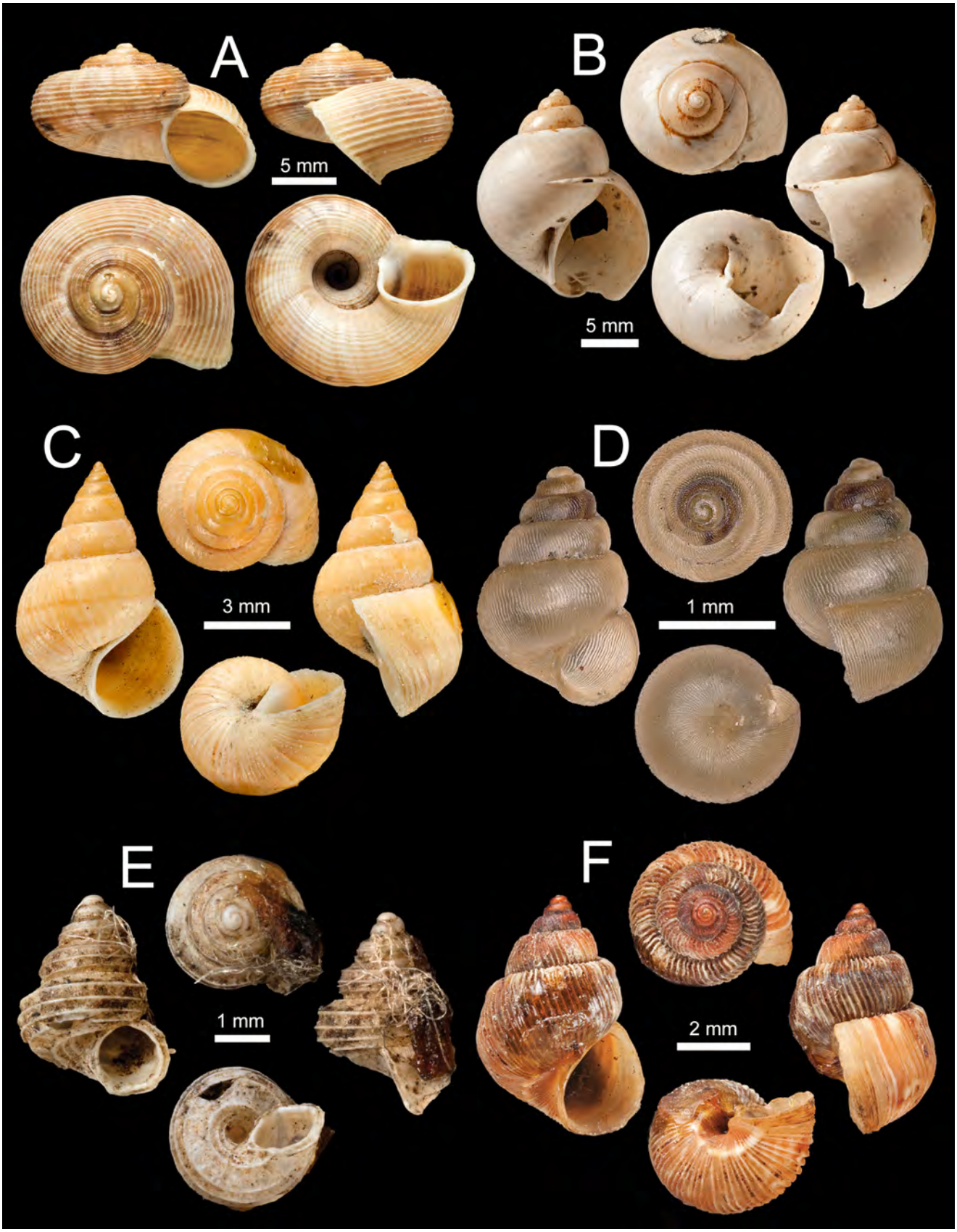


FIGURE 42. **A.** *Cyclostoma aratum* Benson, 1851 (UMZC I.103740.A, syntype). **B.** *Laguncula pulchella* Benson, 1842 (NHMUK 1872.7.10.3, syntype). **C.** *Assiminea fasciata* Benson, 1835 (UMZC I.102115.A, Benson collection). **D.** *Cyclostoma tersum* Benson, 1853 (A1, ZSI/WGRC/I.R-INV. 14959, neotype). **E.** *Omphalotropis distermina* Benson, 1863 (NHMUK 1888.12.4.2036, holotype). **F.** *Omphalotropis harpula* Benson, 1859 (UMZC I.104970.A, syntype).

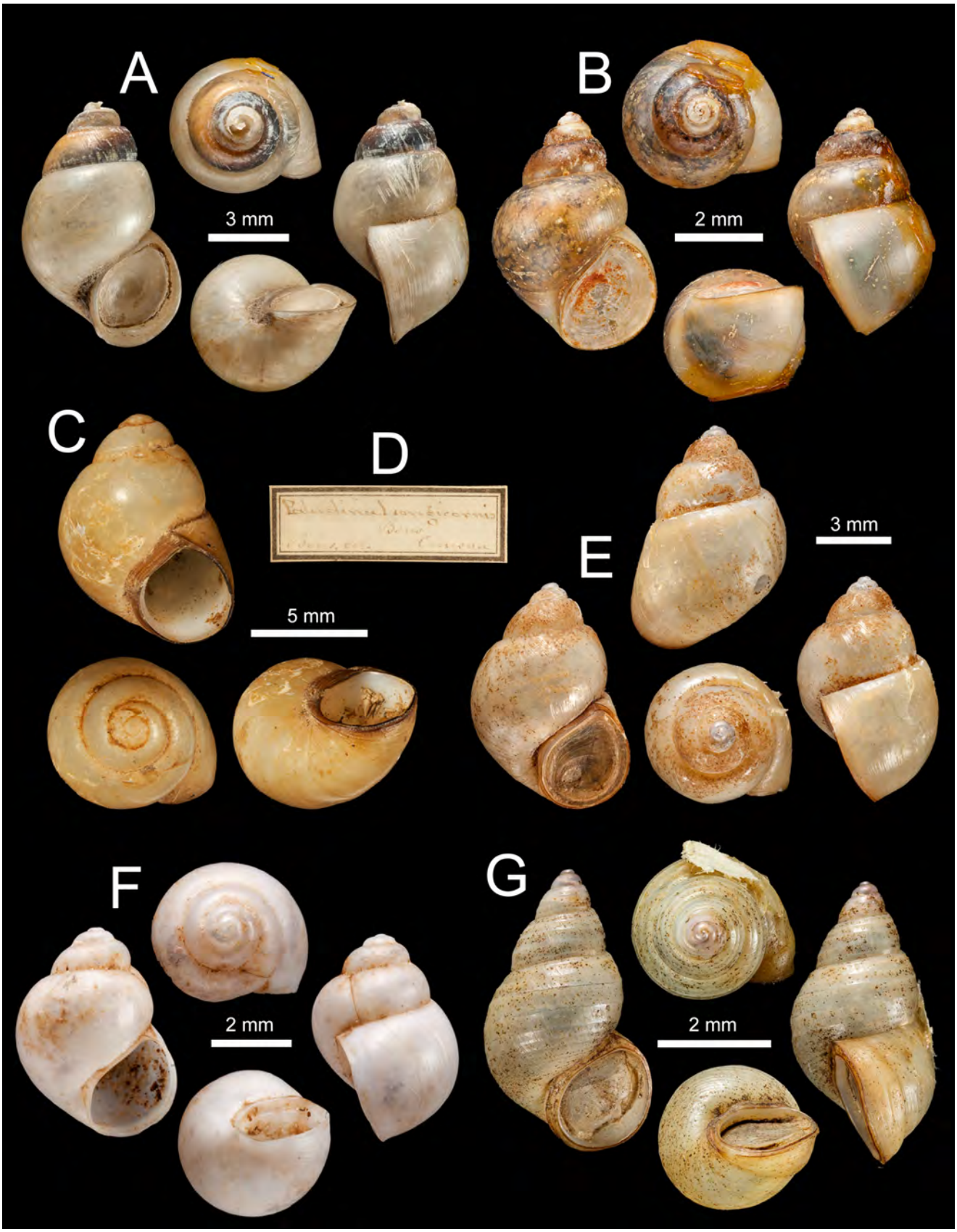


FIGURE 43. **A.** *Paludina cerameopoma* Benson, 1830 (UMZC I.102180.A, syntype). **B.** *Paludina* (*Bithynia*) *pulchella* Benson, 1836 (UMZC I.104985.A, syntype). **C–E.** *Paludina longicornis* Benson, 1842 (C: UMZC I.104440.A, syntype; D: label associated with C; E: NHMUK 1842.9.30.23-26, syntype). **E.** *Bithinia travancorica* Benson, 1860 (NHMUK 1954.6.2.706-707, syntype). **F.** *Paludina striatula* Benson, 1842 (NHMUK 1842.9.30.18-20, syntype).

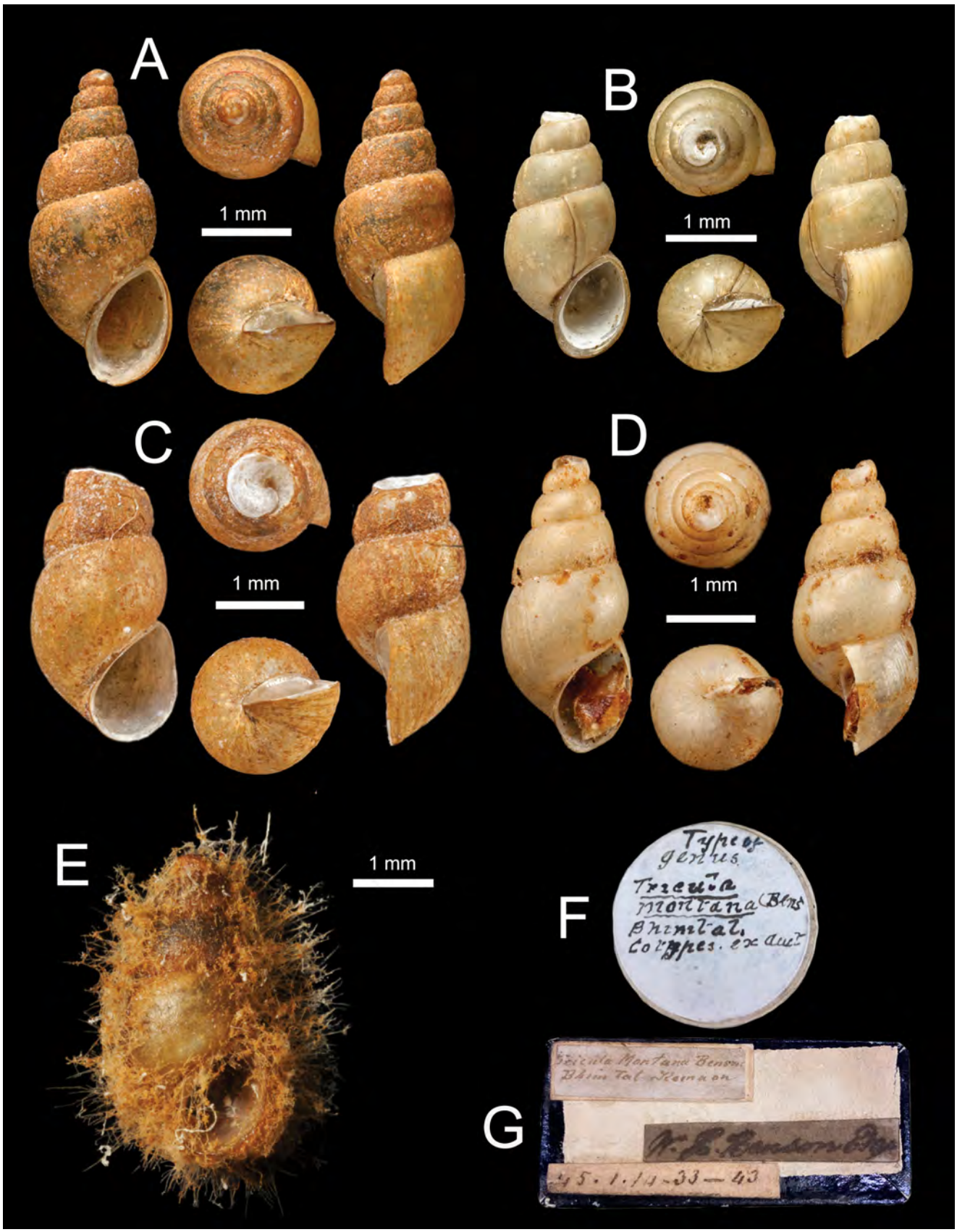


FIGURE 44. A–G. *Tricula montana* Benson, 1843 (A: NHMUK 1906.1.1.2005/1 [1964426], lectotype; B: NHMUK 1906.1.1.2005/2 [1964427], paralectotype; C. NHMUK 1846.1.14.33, paralectotype; D: NHMUK 20140788/1, paralectotype; E: UMZC I.102350.A, paralectotype covered in fungus; F: label that accompanies D; G: label that accompanies C).

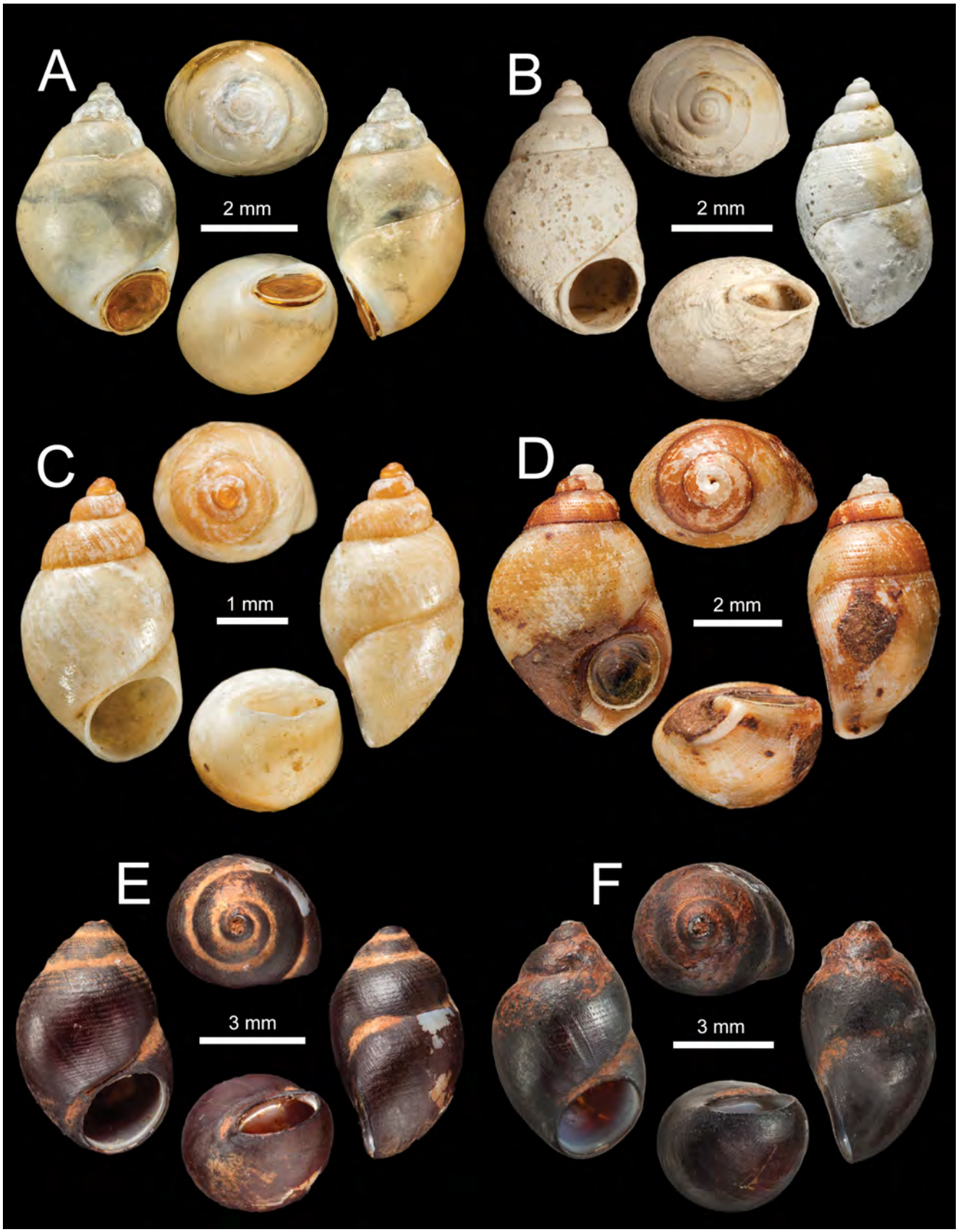


FIGURE 45. **A.** *Nematura deltae* Benson, 1837 (UMZC I.102195.A, syntype). **B.** *Stenothyra foveolata* Benson, 1856 (UMZC I.102895, holotype). **C.** *Stenothyra cingulata* Benson, 1856 (UMZC I.104285.A, syntype). **D.** *Stenothyra monilifera* Benson, 1856 (UMZC I.102865.A, syntype). **E–F.** *Stenothyra strigilata* Benson, 1856 (E: NHMUK 1857.5.9.160, syntype; F: UMZC I.104885, Benson collection).

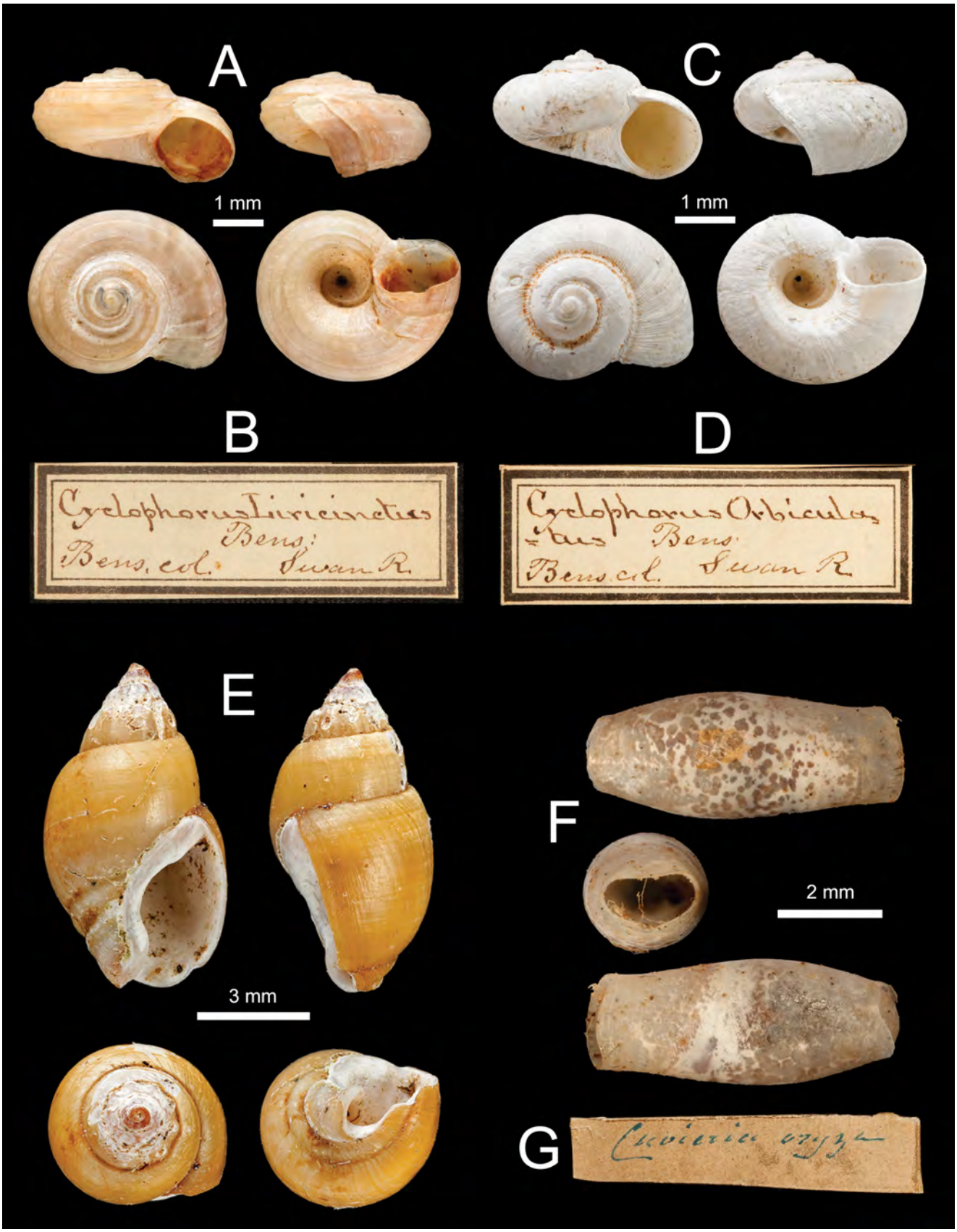


FIGURE 46. **A.** *Cyclostoma liricinctum* Benson, 1853 (UMZC I.104435.A, syntype). **B.** *Cyclostoma orbiculatum* Benson, 1853 (UMZC I.104650.A, syntype). **C.** McAndrew's label associated with A. **D.** McAndrew's label associated with B. **E.** *Clea annesleyi* Benson, 1860 (UMZC I.105165.A, syntype). **E.** *Cuvieria oryza* Benson, 1835 (UMZC I.102040.A, syntype). **F.** Benson's original label associated with E.

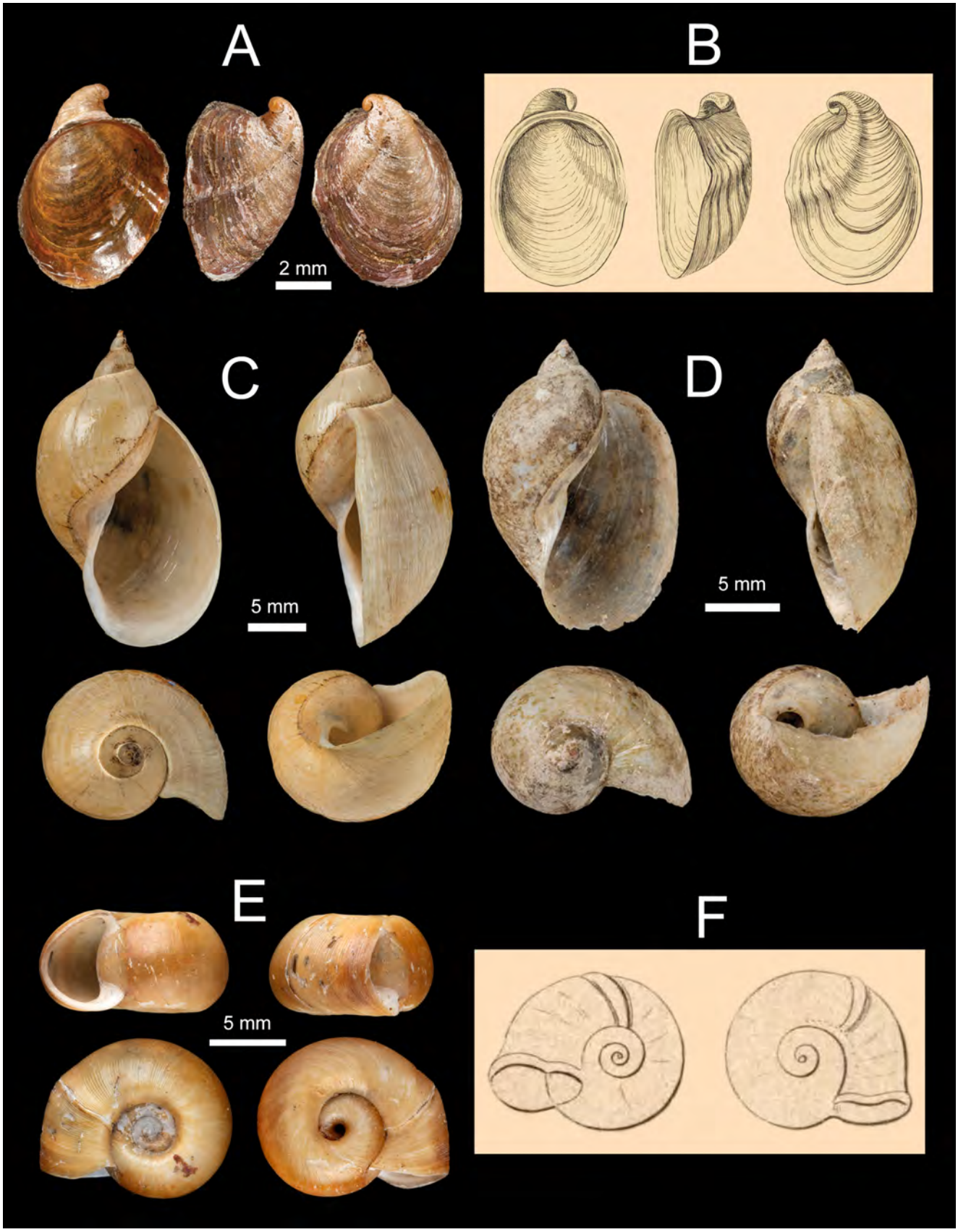


FIGURE 47. A–B. *Camptonyx theobaldi* Benson, 1858 (A: NHMUK 1858.7.23.32, syntype; B: illustration from Benson, 1858a, pl. 12). **C.** *Lymnaea chlamys* Benson, 1836 (UMZC I.102280.A, syntype). **D.** *Lymnaea plicatula* Benson, 1842 (OUMNH.ZC.MO25559, syntype). **E–F.** *Planorbis indicus* Benson, 1836 (E: NHMUK 1841.7.23.5, syntype; F: illustration from Benson, 1829d).

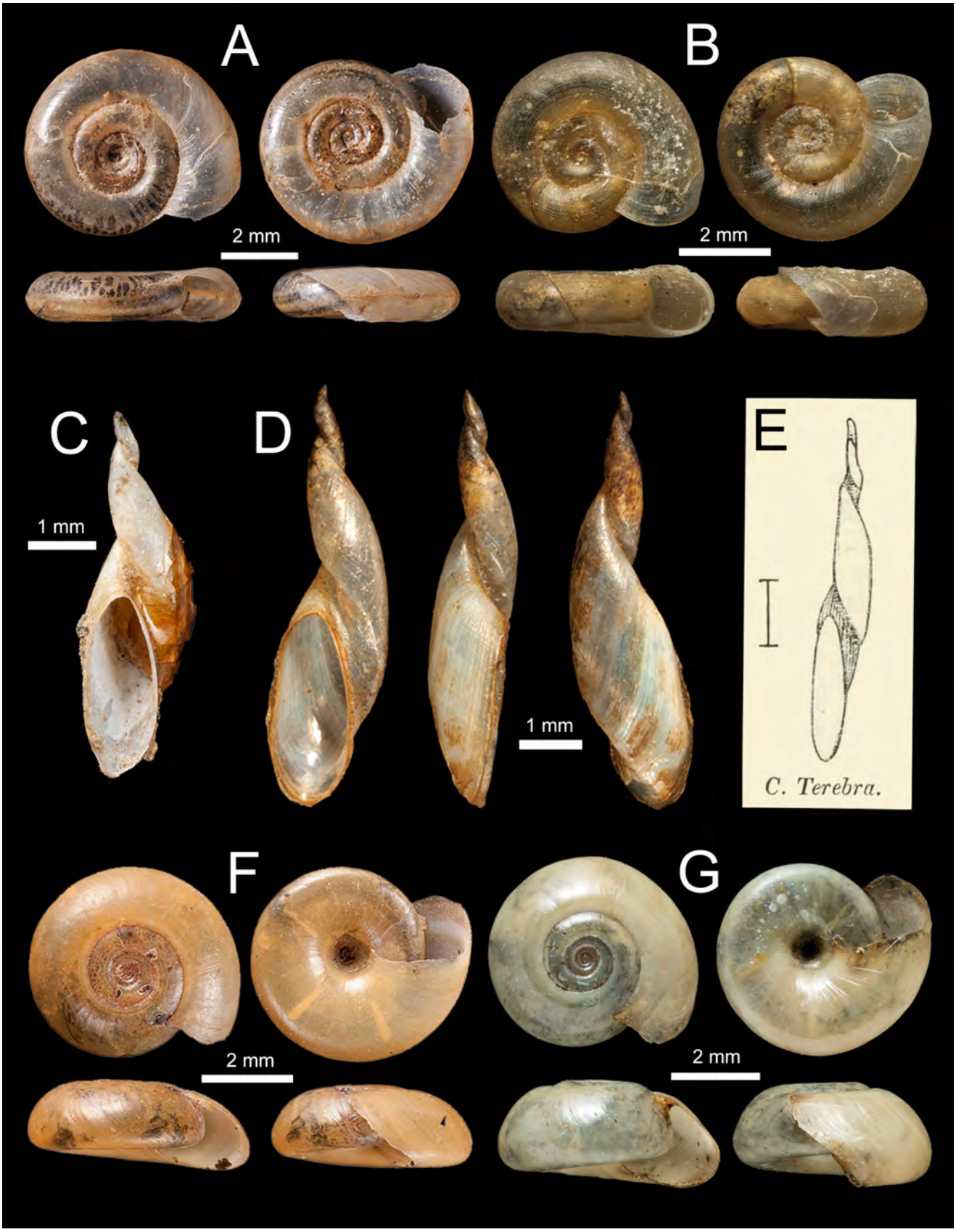


FIGURE 48. **A.** *Helix hyptiocyclos* Benson, 1863 (NHMUK 1864.5.14.4, neotype). **B.** *Planorbis rotula* Benson, 1850 (UMZC I. 103690.A, syntype). **C–E.** *Camptoceras terebra* Benson, 1843 (C: UMZC I.102360.A, syntype; D: UMZC I.102635, McAndrew collection; E: original drawing). **F.** *Planorbis calathus* Benson, 1850 (UMZC I.103570.A, syntype). **G.** *Planorbis hemisphaerula* Benson, 1842 (UMZC I.104365, syntype).

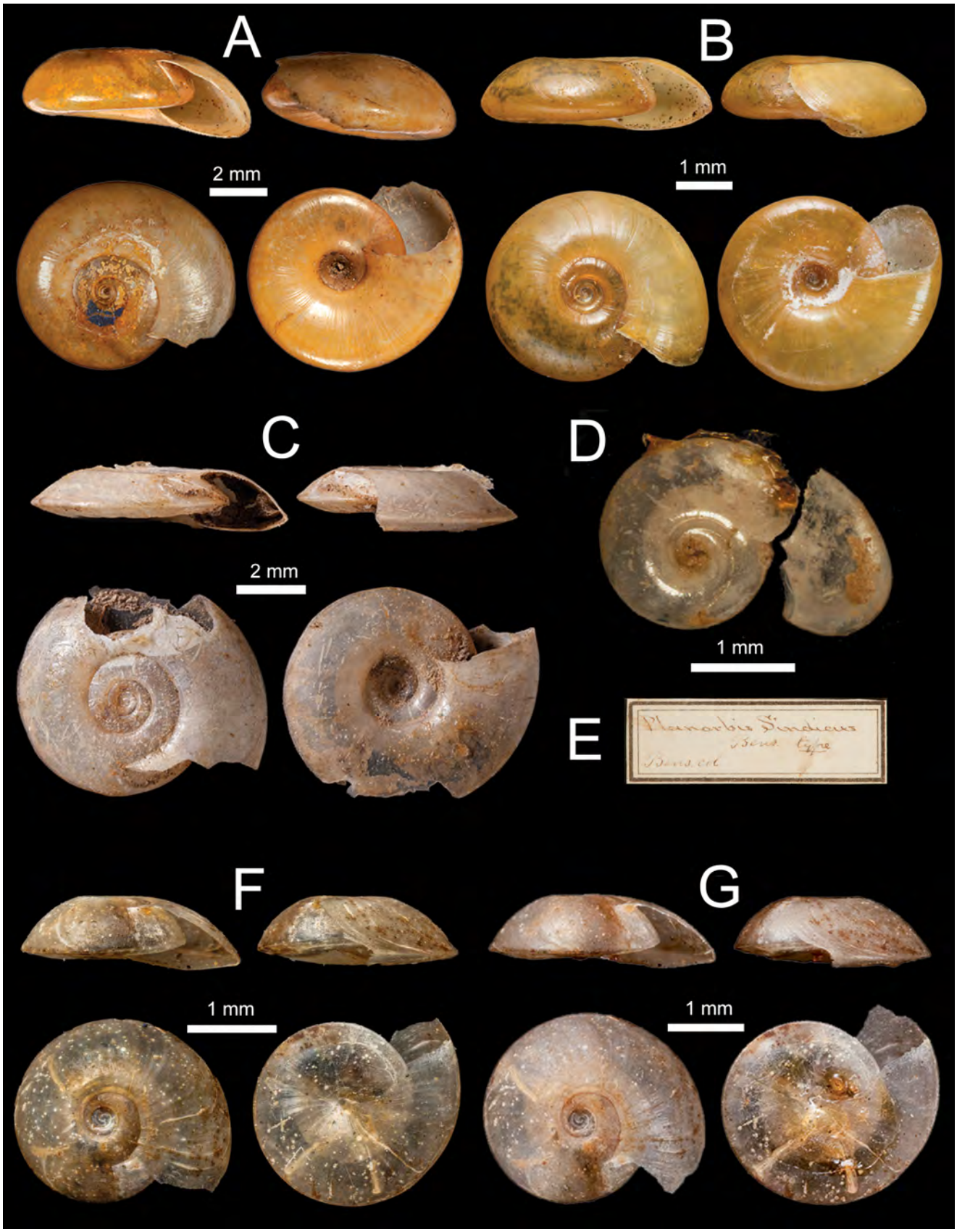


FIGURE 49. **A.** *Planorbis umbilicalis* Benson, 1836 (UMZC I.102235.A, syntype). **B.** *Planorbis caenosus* Benson, 1850 (UMZC I.103663.A, syntype). **C.** *Planorbis papyraceus* Benson, 1842 (NHMUK 1842.9.30.1, syntype). **D–E.** *Planorbis sindicus* Benson, 1850 (D: UMZC I.103595, holotype; E: label that accompanies D). **F–G.** *Planorbis trochoideus* Benson, 1836 (F: UMZC I.102220.A, syntype; G: UMZC I.102215.A, Benson collection).

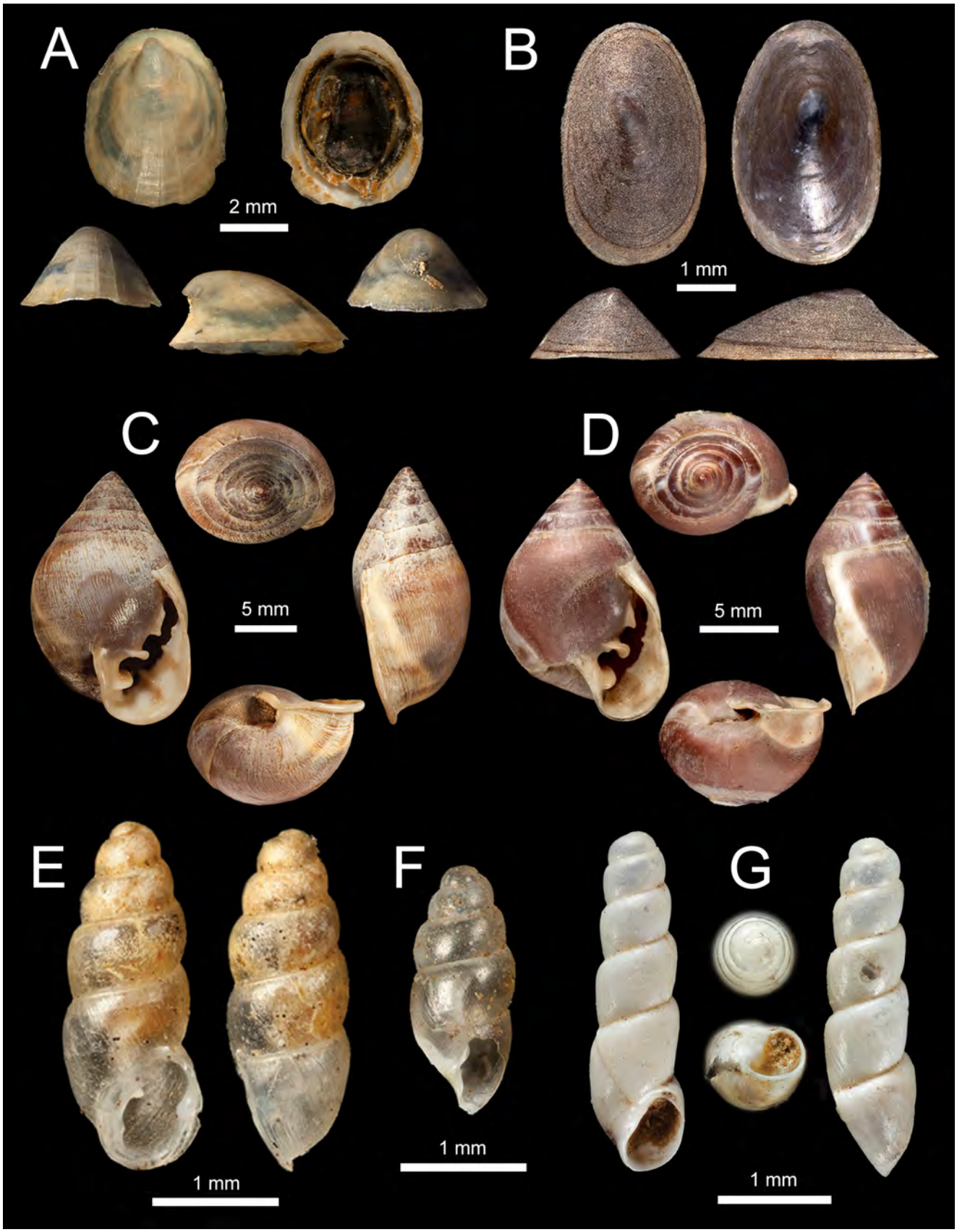


FIGURE 50. **A.** *Ancylus ceylanicus* Benson, 1864 (UMZC I.103950, syntype). **B.** *Ancylus verruca* Benson, 1855 (UMZC I.103565, syntype). **C.** *Scarabus triangularis* Benson, 1836 (C: UMZC I.102105.A, syntype; D: NHMUK 1841.7.23.21, syntype). **D.** *Carychium indicum* Benson, 1849 (UMZC I.102335.A, syntype). **E.** *Carychium boysianum* Benson, 1864 (UMZC I.102435.H, holotype). **F.** *Coilostele scalaris* Benson, 1864 (UMZC I.103255.A, McAndrew collection).

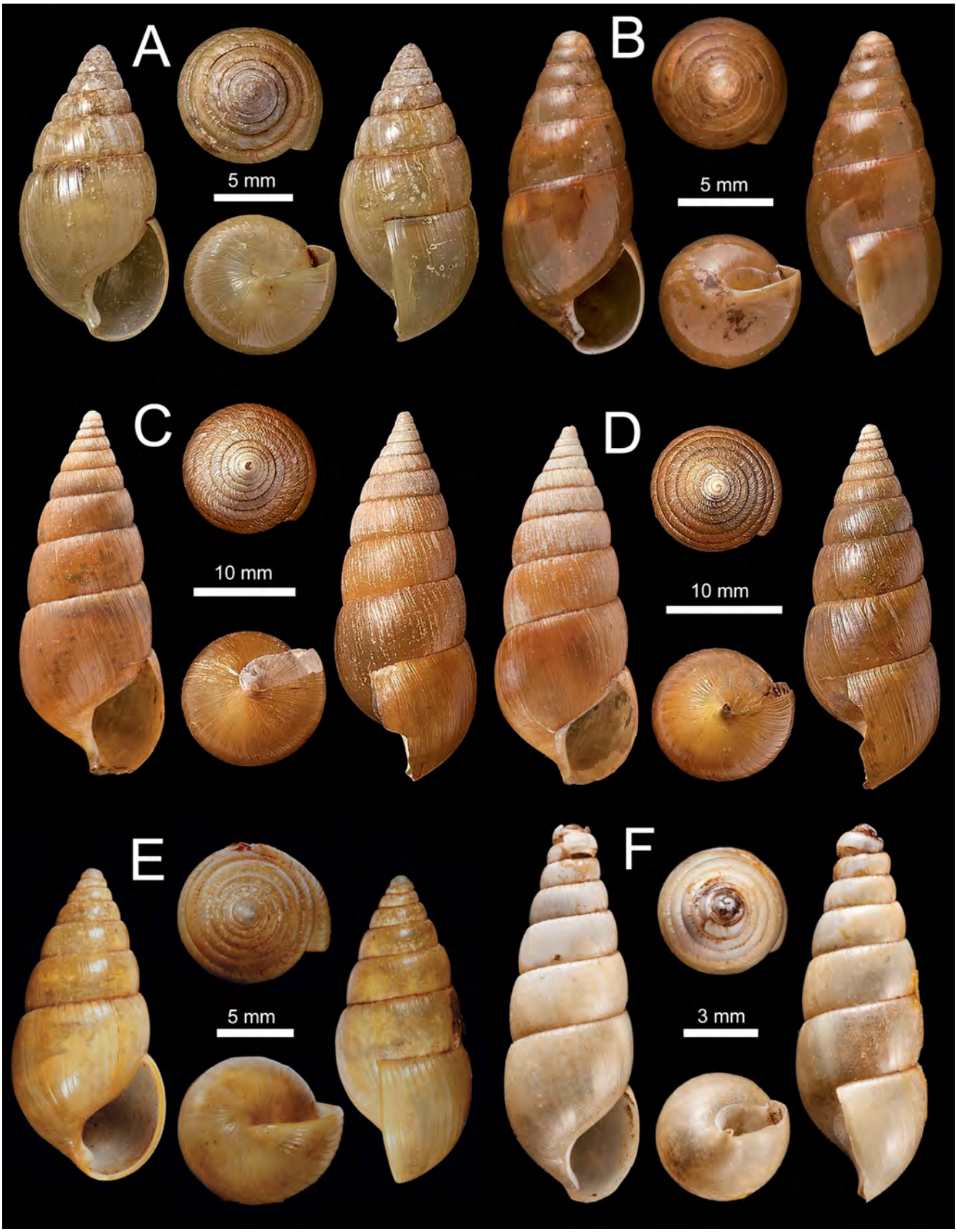


FIGURE 51. **A.** *Achatina arthuri* Benson, 1864 (NHMUK 1946.10.16.35, lectotype). **B.** *Achatina botellus* Benson, 1860 (NHMUK 1946.10.16.43, neotype). **C–D.** *Achatina chessoni* Benson, 1860 (C: NHMUK 1946.10.16.16, lectotype; D: NHMUK 1946.10.16.17-20, paralectotype). **E.** *Achatina crassilabris* Benson, 1836 (UMZC I.102430, Benson collection). **F.** *Achatina leptospira* Benson, 1865 (NHMUK 1946.10.16.13, syntype).

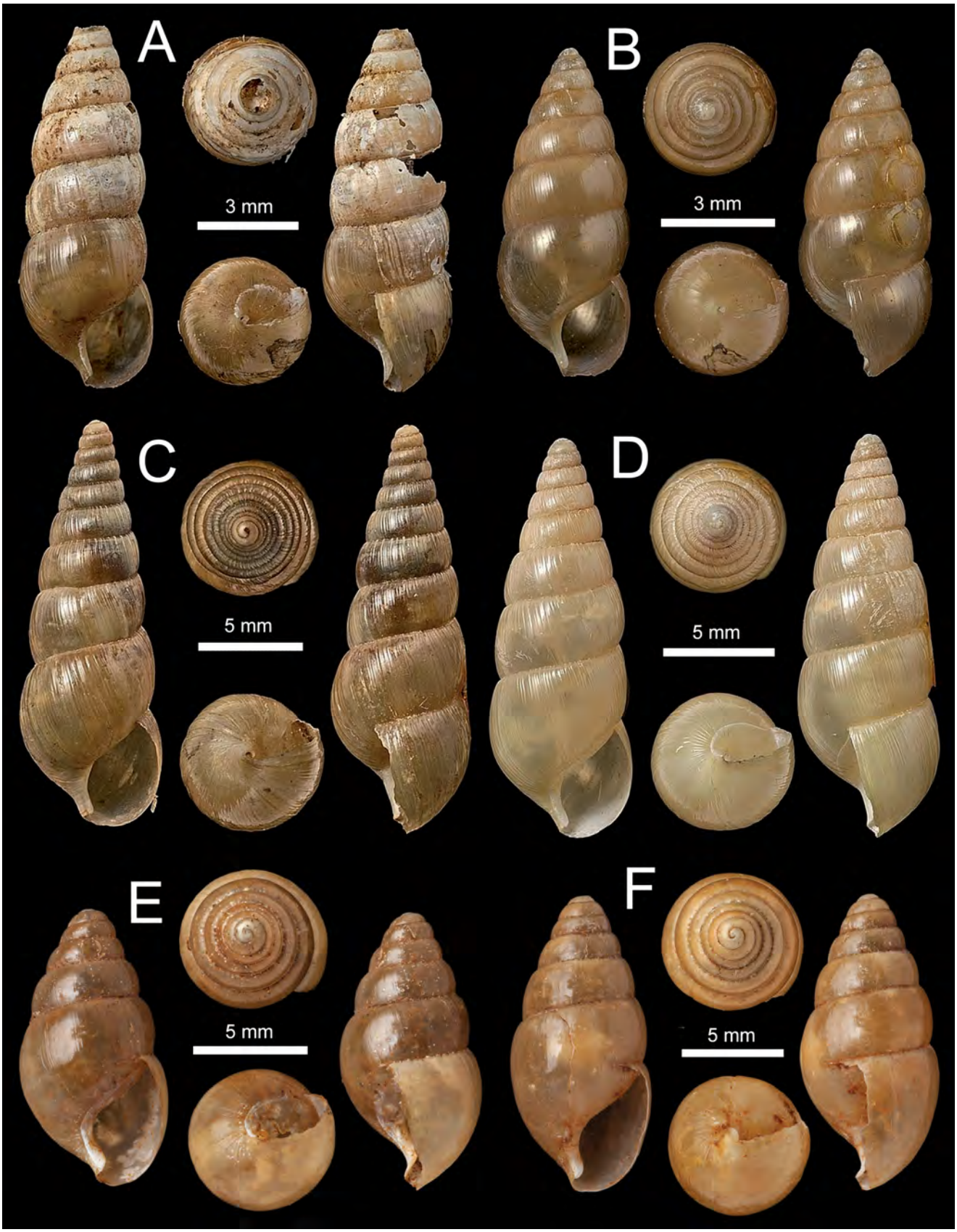


FIGURE 52. **A–B.** *Achatina fairbanki* Benson, 1865 (A: NHMUK 1946.10.16.41, lectotype; B: NHMUK 1946.10.16.42, paralectotype). **C–D.** *Achatina notigena* Benson, 1860 (C: NHMUK 1946.10.16.73, lectotype; D: NHMUK 1946.10.16.74-77, paralectotype). **E–F.** *Achatina panaetha* Benson, 1860 (E: NHMUK 1954.6.2.184; F: NHMUK 1954.6.2.185).

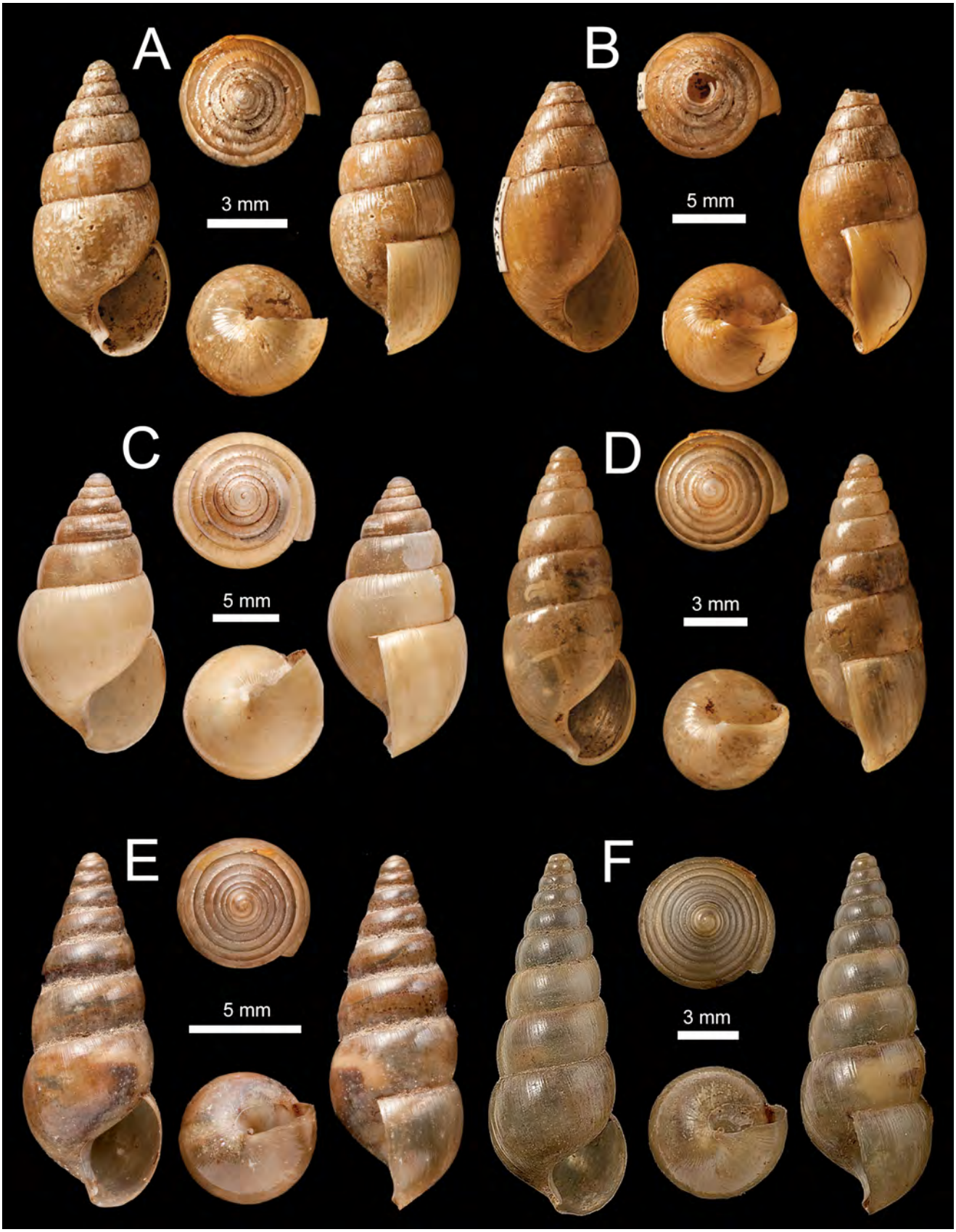


FIGURE 53. **A.** *Achatina orobia* Benson, 1860 (NHMUK 1946.10.16.82-83, syntype). **B.** *Achatina parabilis* Benson, 1856 (NHMUK 1946.10.16.84, syntype). **C.** *Achatina praelustris* Benson, 1860 (NHMUK 1946.10.16.55-57, syntype). **D.** *Achatina pyramis* Benson, 1860 (NHMUK 1946.10.16.65, syntype). **E–F.** *Achatina sarissa* Benson, 1860 (E: NHMUK 1946.10.16.69, lectotype; F: NHMUK 1946.10.16.70-72, paralectotype).

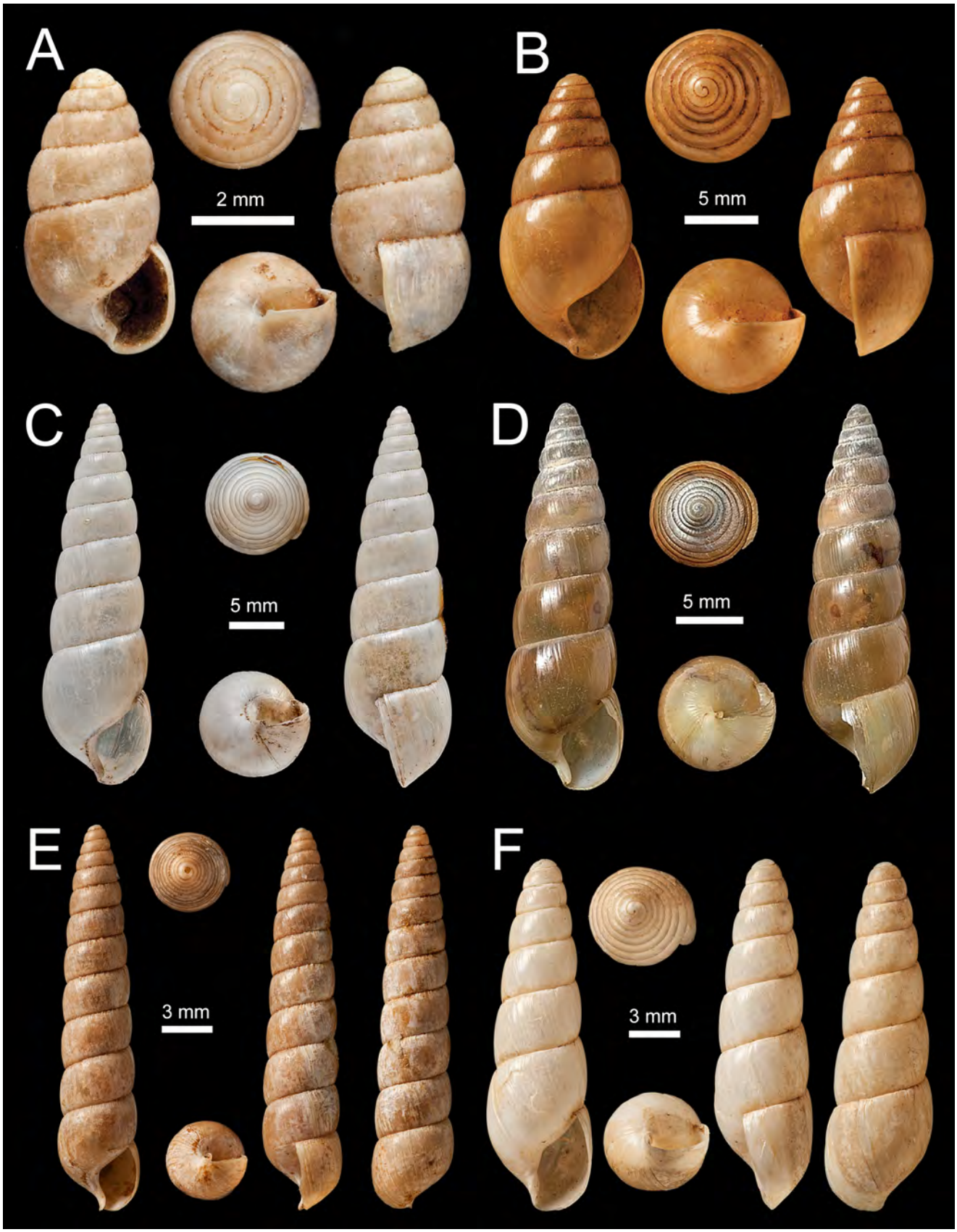


FIGURE 54. **A.** *Achatina scrutillus* Benson, 1860 (NHMUK 1888.12.4.1279, neotype). **B.** *Achatina serena* Benson, 1860 (NHMUK 1946.10.16.66-68, syntype). **C–D.** *Achatina vadalica* Benson, 1865 (C: NHMUK 1946.10.16.24, lectotype; D: NHMUK 1946.10.16.25-26, paralectotype). **E.** *Achatina veruina* Benson, 1853 (NHMUK 1912.8.16.306, neotype). **F.** *Achatina erecta* Benson, 1842 (NHMUK 1991104A, neotype).

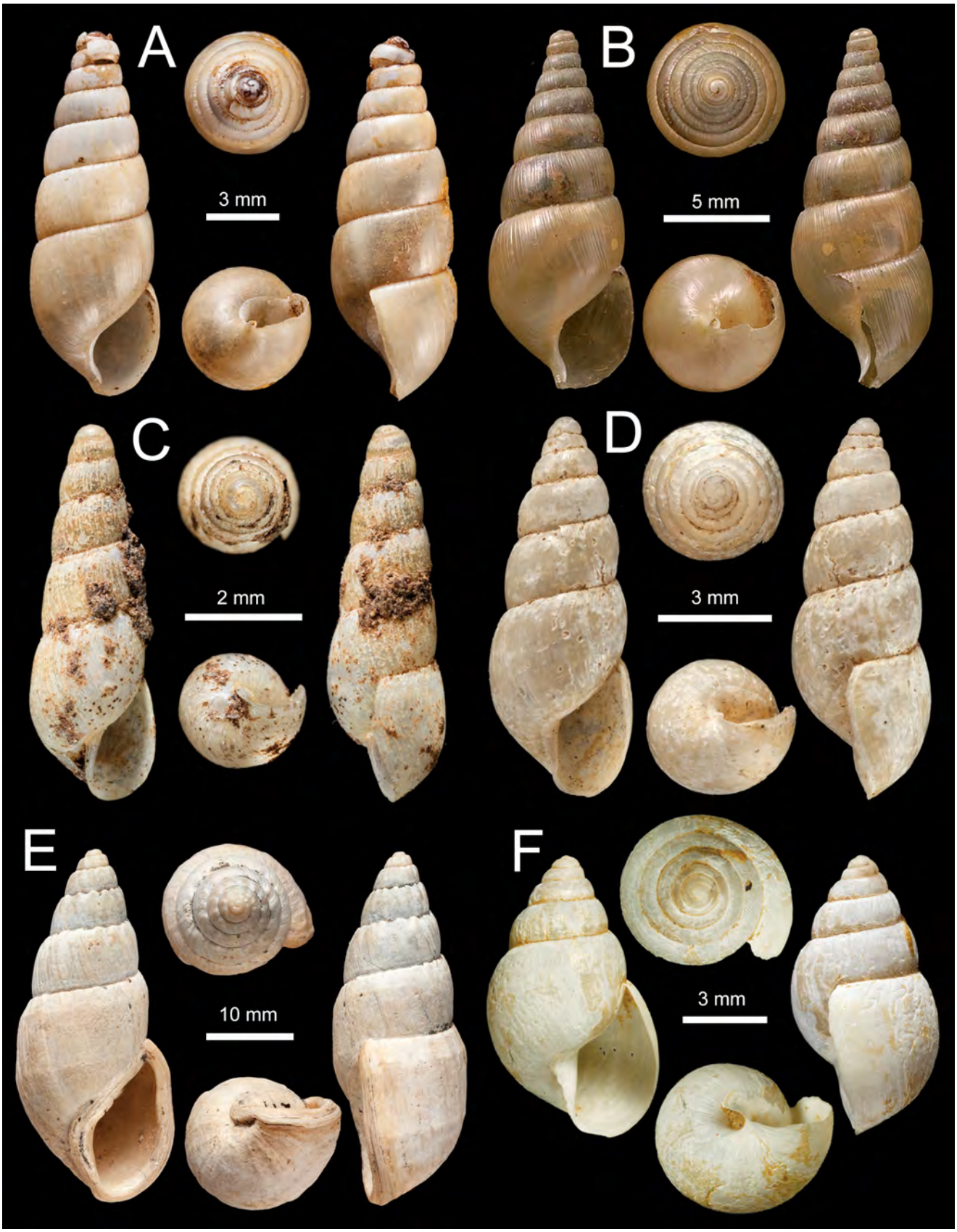


FIGURE 55. **A.** *Achatina hastula* Benson, 1860 (NHMUK 1906.1.1.880, neotype). **B.** *Achatina tenuispira* Benson, 1836 (UMZC I.102045, Benson collection). **C.** *Bulimus compressilabris* Benson, 1856 (MANCH EE.7707, syntype). **D.** *Spiraxis layardi* Benson, 1863 (UMZC I.103270, syntype). **E.** *Bulimus relegatus* Benson, 1851 (UMZC I.105005, syntype). **F.** *Bulimus putus* Benson, 1857 (UMZC I.102795, holotype).

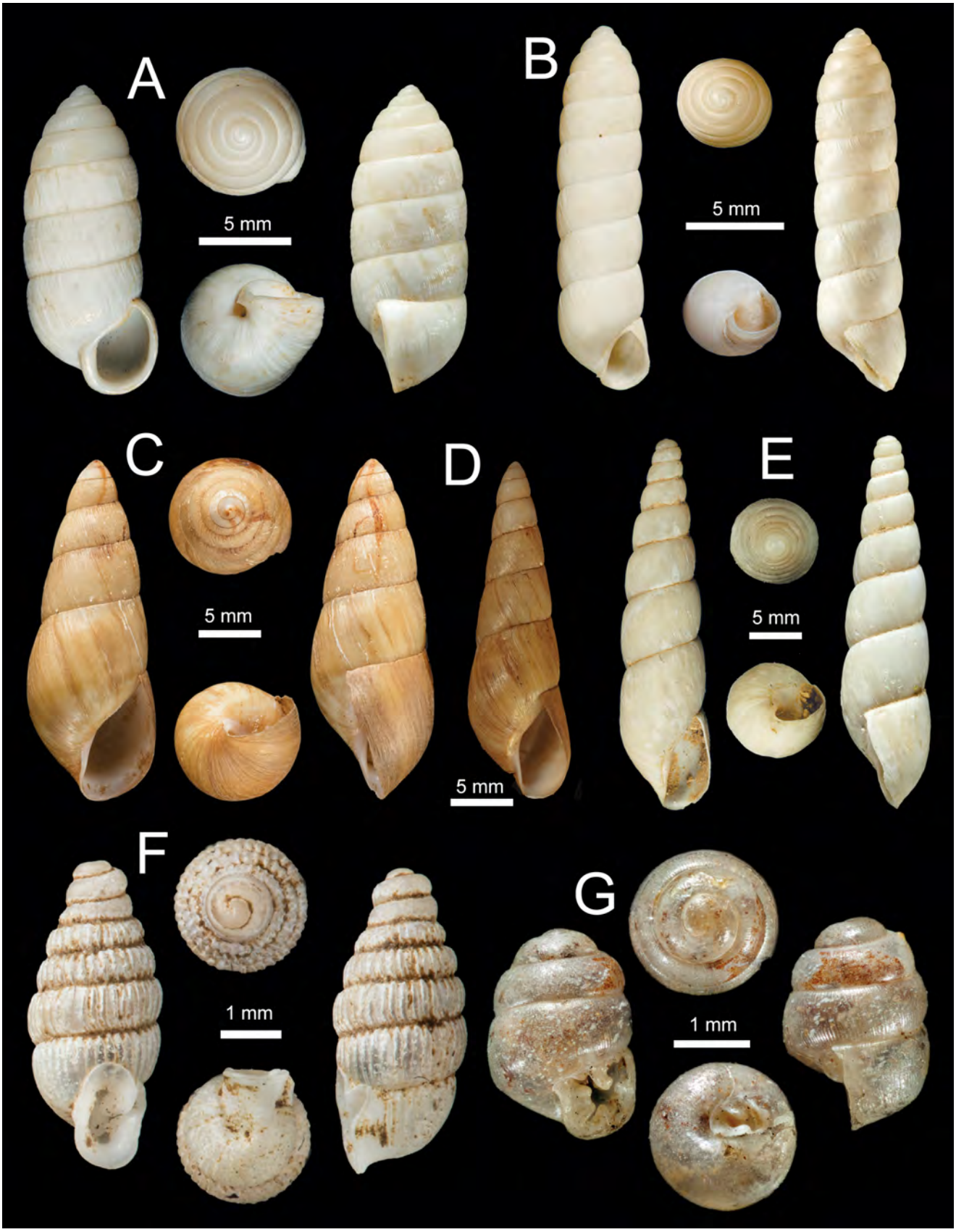


FIGURE 56. **A.** *Bulimus estellus* Benson, 1857 (UMZC I.102820, syntype). **B.** *Bulimus pertica* Benson, 1857 (UMZC I.102825, syntype). **C.** *Spiraxis haughtoni* Benson, 1863 (UMZC I.103425.A, syntype). **D.** *Spiraxis haughtoni* var. *oxynter* Benson, 1863 (UMZC I.103425.D, Benson collection). **E.** *Spiraxis walkeri* Benson, 1863 (UMZC I.103115.A, syntype). **F.** *Pupa* (*Ennea*) *vara* Benson, 1859 (NHMUK 1888.12.4.604-606, neotype). **G.** *Pupa ofella* Benson, 1864 (UMZC I.104665, holotype).

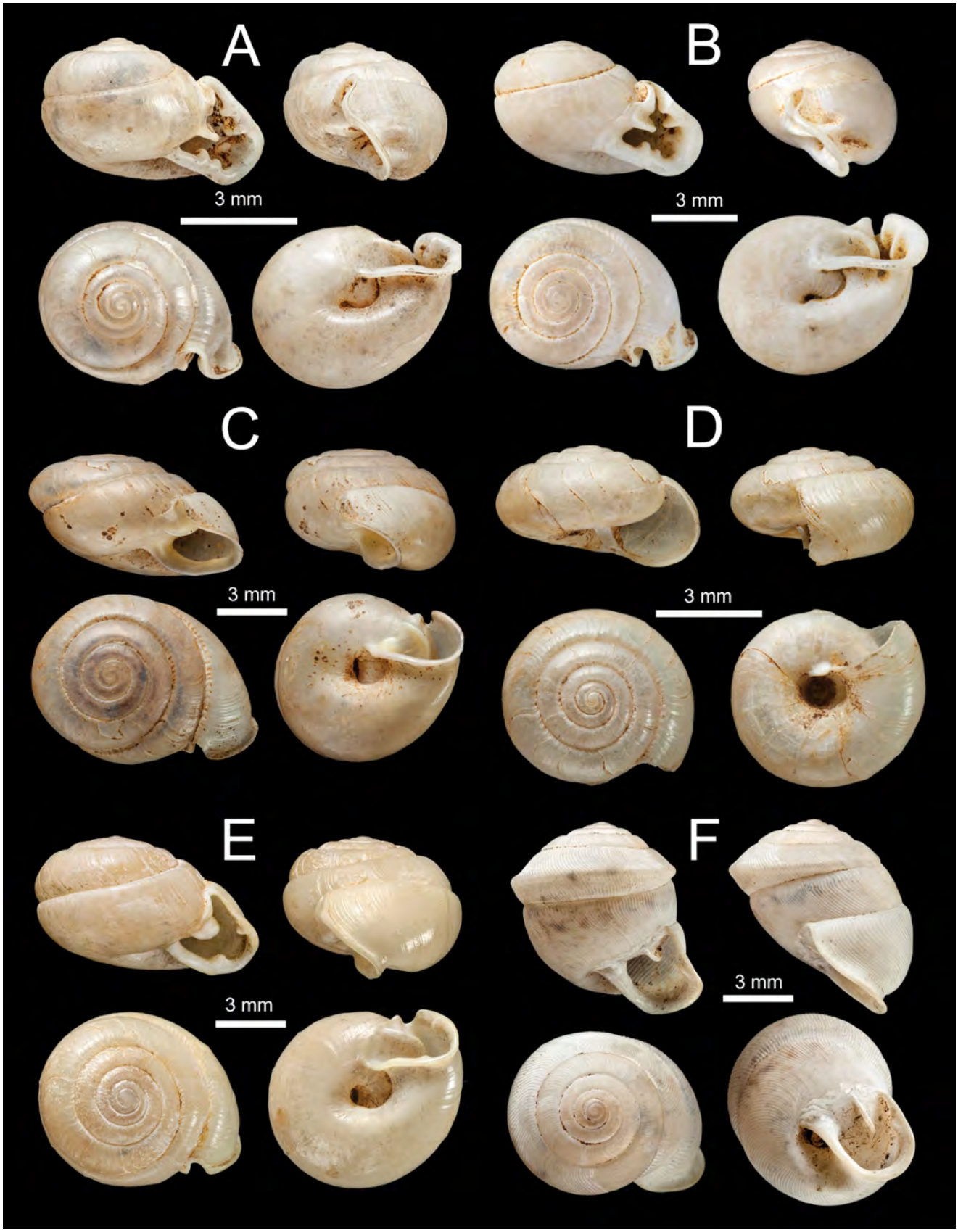


FIGURE 57. A–B. *Streptaxis theobaldi* Benson, 1859 (A: UMZC I.102535, syntype; B: NHMUK 1888.12.4.784, Theobald collection). **C–D.** *Streptaxis layardiana* Benson, 1853 (C: UMZC I.104976, McAndrew collection; D: UMZC I.104977, McAndrew collection). **E.** *Streptaxis cingalensis* Benson, 1853 (UMZC I.103945.A, neotype). **F.** *Streptaxis sankeyi* Benson, 1859 (UMZC I.102740.A, neotype).

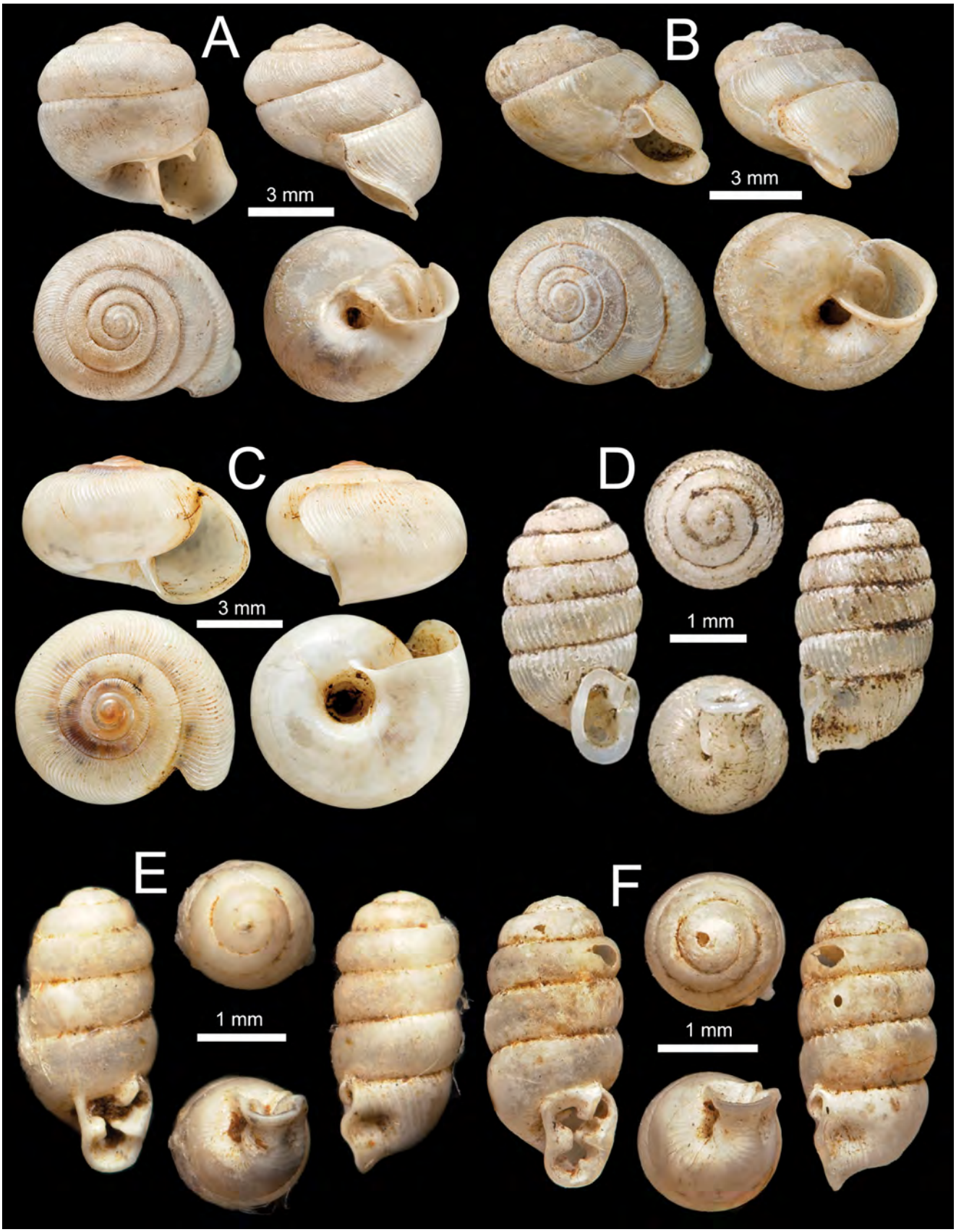


FIGURE 58. **A–B.** *Streptaxis andamanica* Benson, 1860 (A: UMZC I.103160.A, Benson collection; B: NHMUK 1888.12.4.787, Theobald collection). **C.** *Helix bombax* Benson, 1859 (UMZC I.102470.A, holotype). **D.** *Ennea stenopylis* Benson, 1860 (UMZC I.103135, syntype). **E–F.** *Pupa planguncula* Benson, 1863 (E: UMZC I.103310.B, lectotype; F: UMZC I.103310.A, paralectotype).

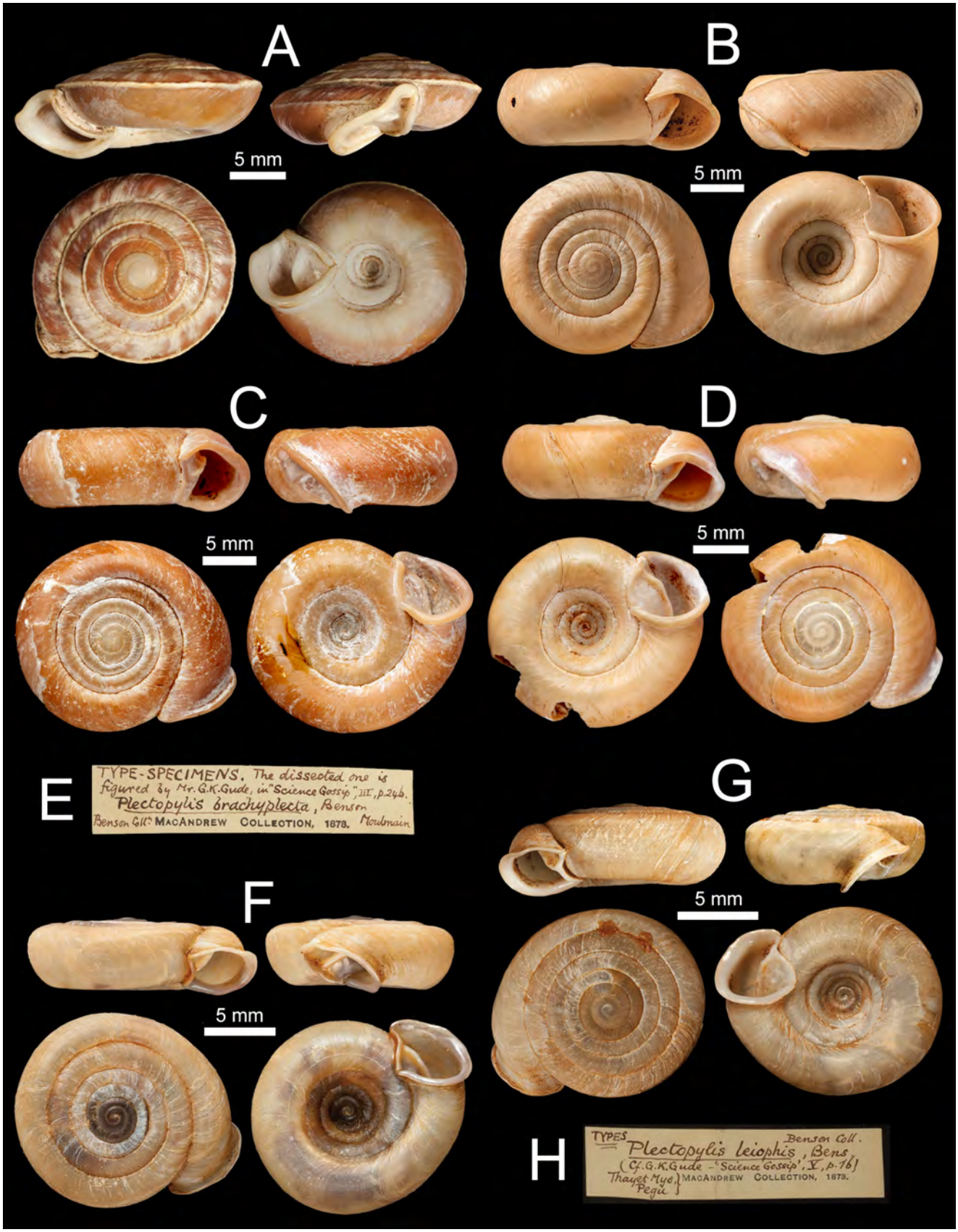


FIGURE 59. **A.** *Helix cyclaspis* Benson, 1859 (UMZC I.102700.A, neotype). **B–E.** *Helix brachyplecta* Benson, 1863 (B: NHMUK 1954.6.2.282, J.S. Hawkins collection; C: UMZC I.103145.A, lectotype; D: UMZC I.103145.B paralectotype; E: labels that accompany C and D). **F.** *Helix* (*Plectopylis*) *refuga var. dextrorsa* Benson, 1860 (UMZC I.104955.A, syntype). **G–H.** *Helix leiophis* Benson, 1860 (G: UMZC I.103265.A, syntype; H: label that accompanies G).



FIGURE 60. **A.** *Helix pinacis* Benson, 1859 (UMZC I.102755, syntype). **B.** *Helix plectostoma* Benson, 1836 (UMZC I.102155, syntype). **C.** *Helix bisculpta* Benson, 1851 (NHMUK 1912.8.16.204-205). **D.** Label that accompanies B. **E.** *Helix tollini* Benson, 1856 (UMZC I.102885.A, syntype). **F.** *Helix sabuletorum* Benson, 1851 (UMZC I.103760.A, syntype).

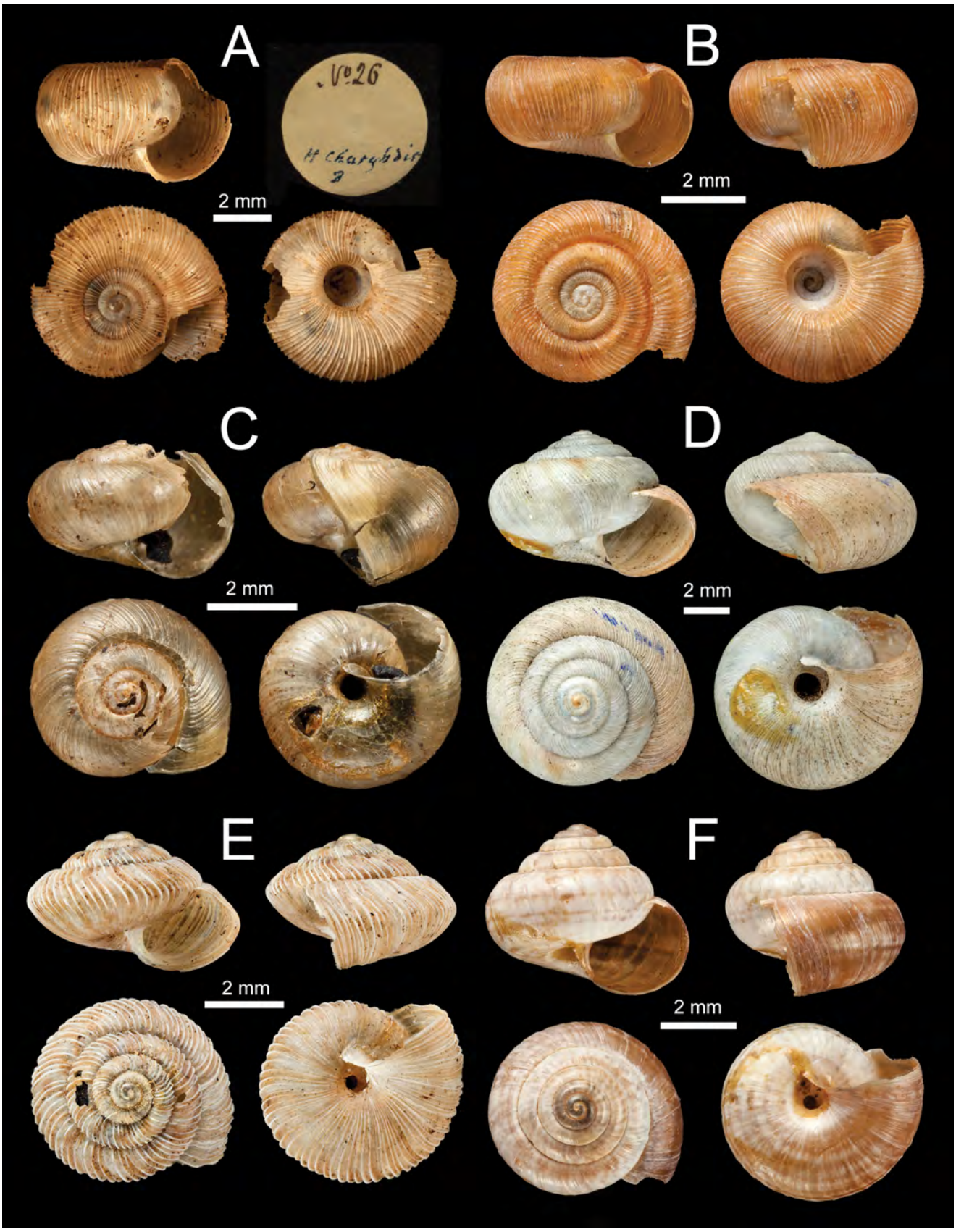


FIGURE 61. **A.** *Helix charybdis* Benson, 1856 (UMZC I.104230, syntype). **B.** *Helix vorticialis* Benson, 1850 (UMZC I.103605.A, lectotype). **C.** *Helix omphalion* Benson, 1864 (UMZC I.103190.A, syntype). **D.** *Helix perplicata* Benson, 1851 (UMZC I.103730, syntype). **E.** *Helix browningii* Benson, 1864 (UMZC I.103225.A, Benson collection). **F.** *Helix paludicola* Benson, 1850 (UMZC I.103615.A, syntype).

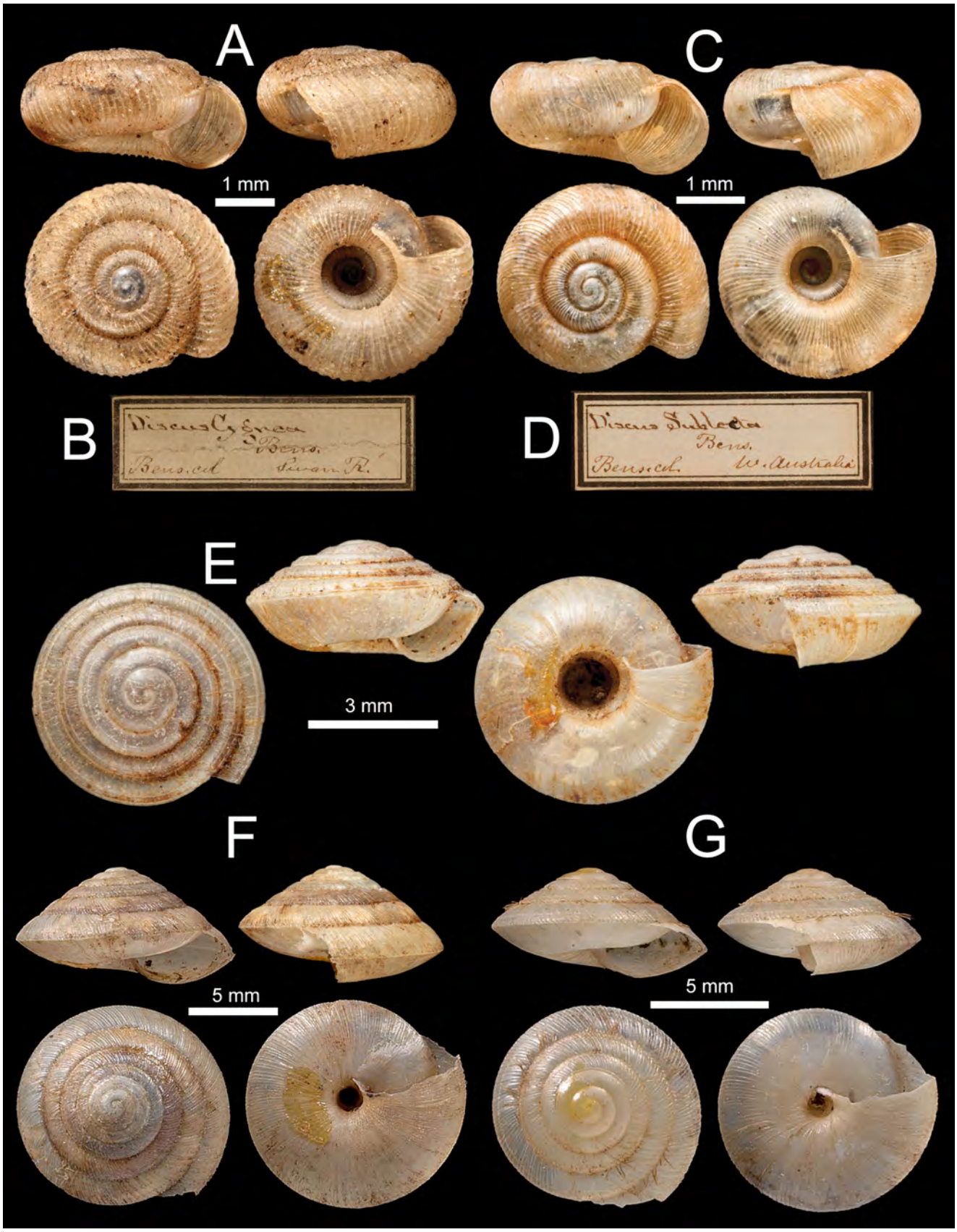


FIGURE 62. **A.** *Helix cygnea* Benson, 1853 (UMZC I.103775.A, syntype). **B.** *Helix sublesta* Benson, 1853 (UMZC I.103770.A, syntype). **C.** Label for A. **D.** Label for B. **E.** *Helix puteolus* Benson, 1853 (UMZC I.104565.A, syntype). **F–G.** *Helix crinigera* Benson, 1850 (E: UMZC I.103580.A, lectotype; F: UMZC I.103580.B, paralectotype).

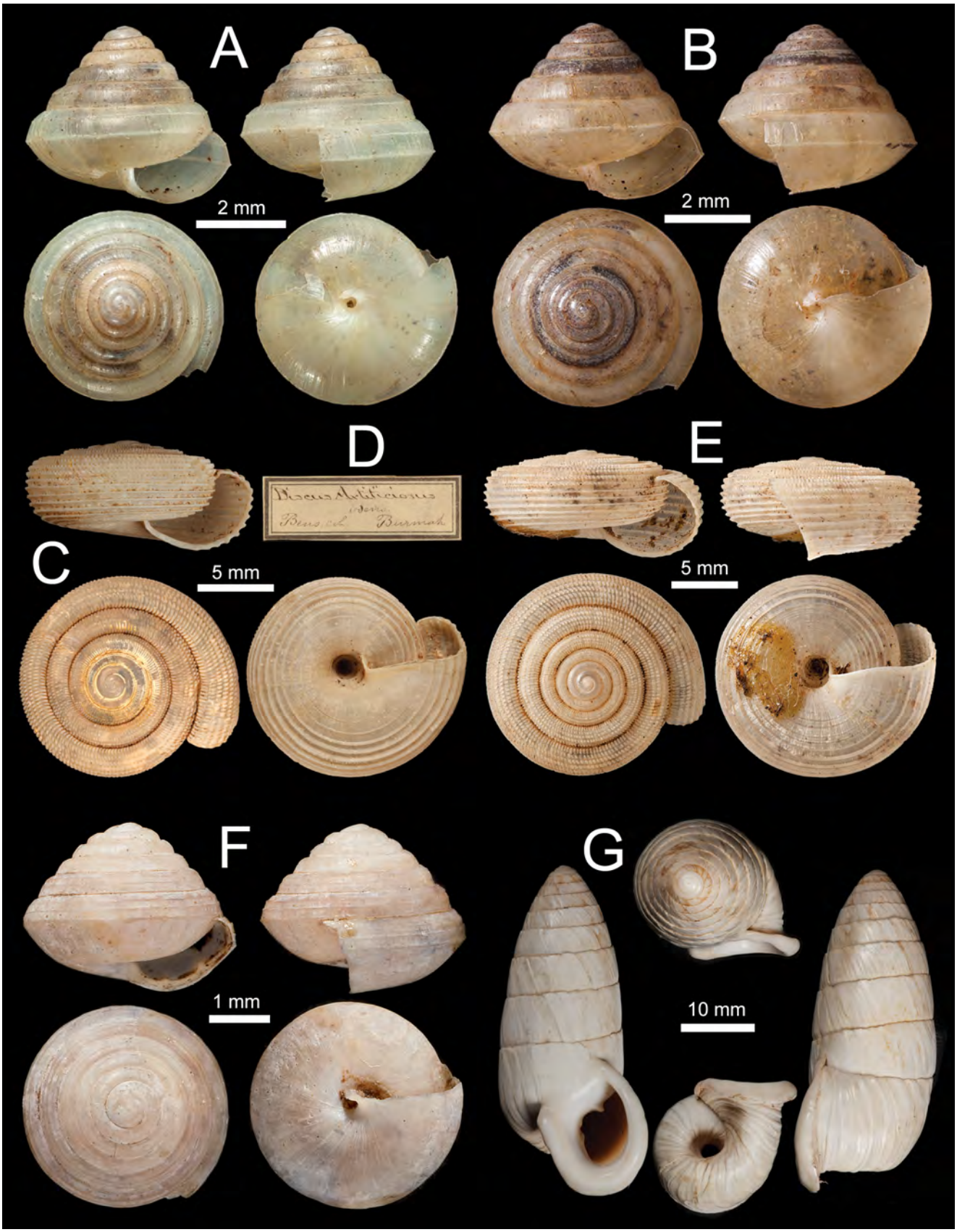


FIGURE 63. **A–B.** *Helix mononema* Benson, 1853 (A: NHMUK 1912.8.16.349, neotype; B: NHMUK 1912.8.16.350, Edgar Layard collection). **C–E.** *Helix artificiosa* Benson, 1856 (C: UMZC I.103035.A, syntype; D: label that accompanies C; E: NHMUK 1888.12.4.629-631, Theobald collection). **E.** *Helix bidenticulata* Benson, 1852 (UMZC I.103915, lectotype). **F.** *Pupa regia* Benson, 1849 (UMZC I.105000.A, syntype).

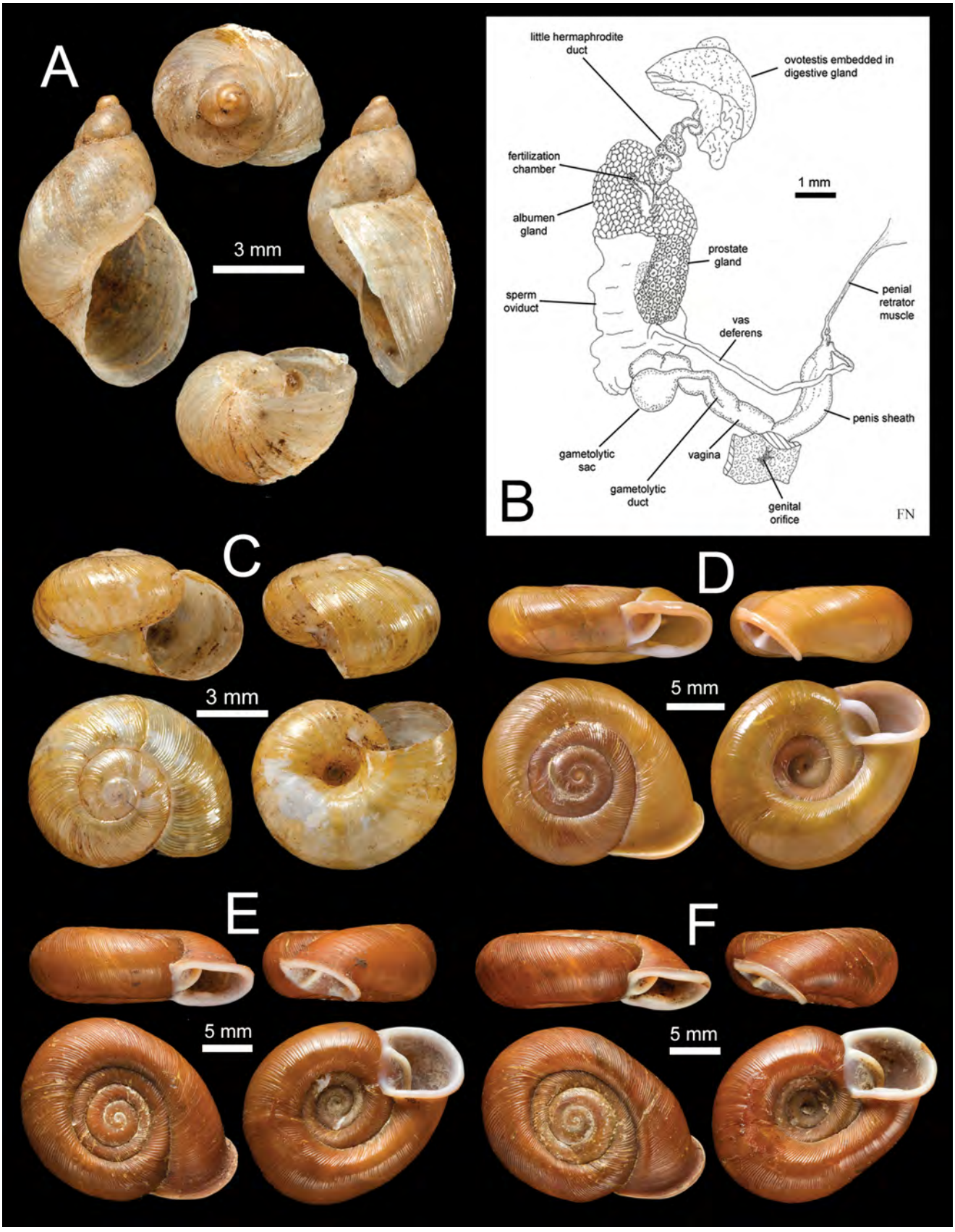


FIGURE 64. **A–B.** *Succinea orientalis* Benson, 1851 (C: NHMUK 20180282/1; D: anatomical drawing by F. Naggs). **C.** *Helix dumeticola* Benson, 1851 (UMZC I.104960.A, lectotype). **D.** *Helix* (*Corilla*) *odontophora* Benson, 1865 (UMZC I.103295.A, McAndrew collection). **E–F.** *Helix anax* Benson, 1865 (E: UMZC I.103150.C, lectotype; F: UMZC I.103150.A, paralectotype).

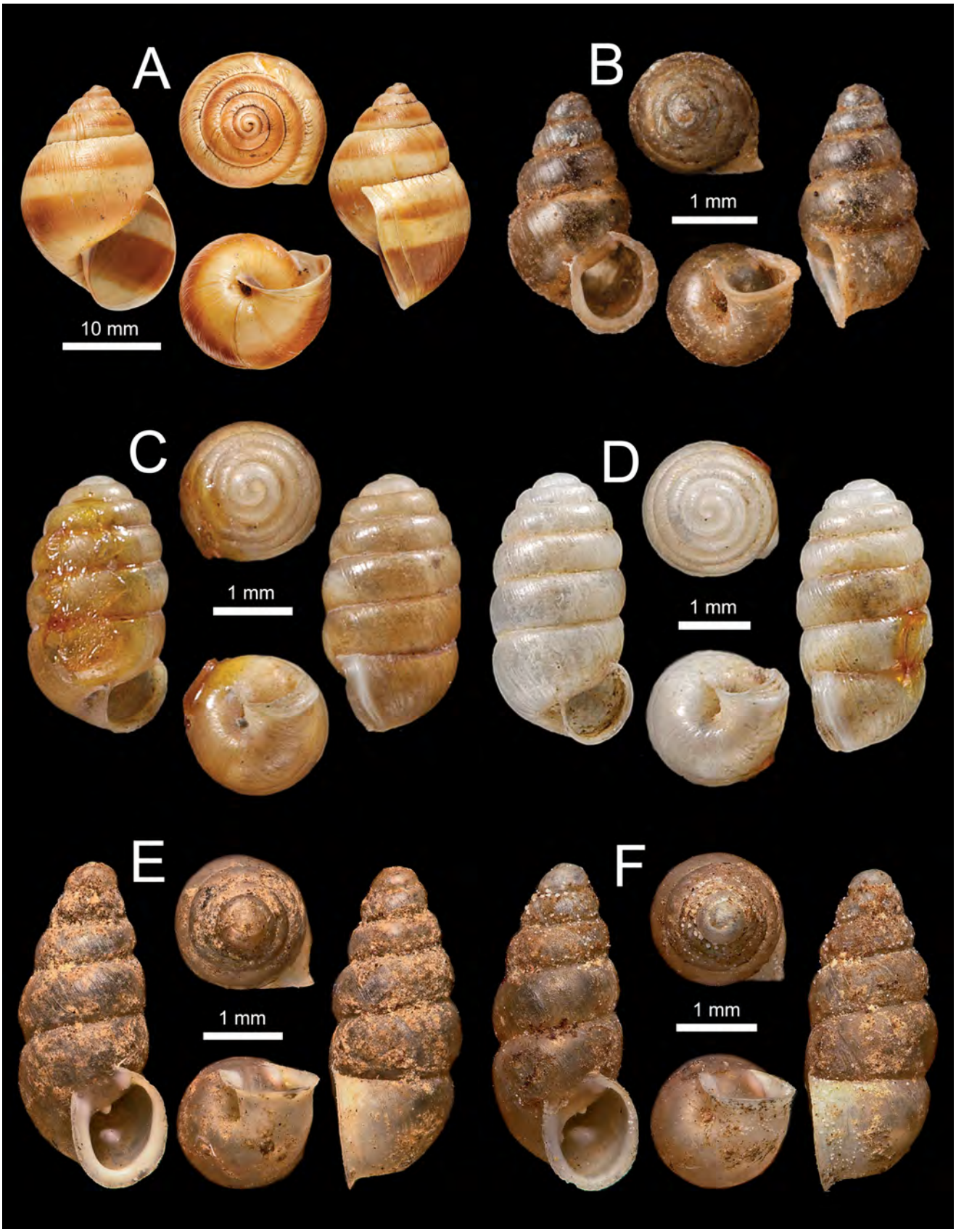


FIGURE 65. **A.** *Bulimus baconi* Benson, 1854 (UMZC I.103865, syntype). **B.** *Bulimus gemmula* Benson, 1856 (NHMUK 20150118/1, syntype). **C–D.** *Pupa eurina* Benson, 1864 (C: UMZC I.103110.A, syntype; D: UMZC I.103110.B, syntype). **E–F.** *Pupa muscerda* Benson, 1853 (E: UMZC I.103977.A, lectotype; F: UMZC I.103977.B, paralectotype).

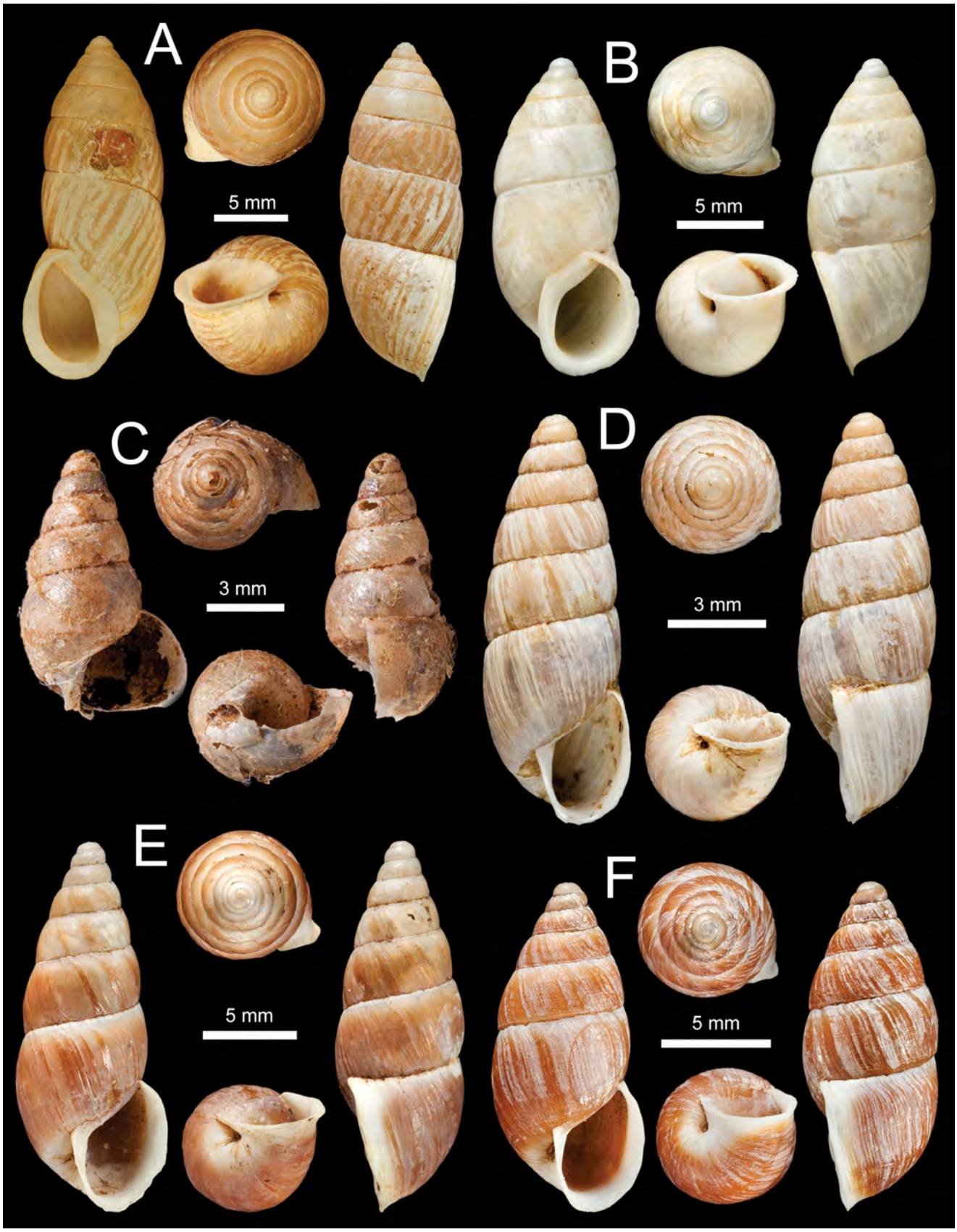


FIGURE 66. **A.** *Bulimus domina* Benson, 1857 (UMZC I.102785.A, syntype). **B.** *Bulimus salsicola* Benson, 1857 (UMZC I.102800, lectotype). **C.** *Bulimus panos* Benson, 1853 (NHMUK 1912.8.16.326, neotype). **D.** *Bulimus smithei* Benson, 1865 (UMZC I.103100, syntype). **E–F.** *Bulimus stalix* Benson, 1863 (E: UMZC I.103275.A, neotype; F: UMZC I.103275.B, R. McAndrew collection).

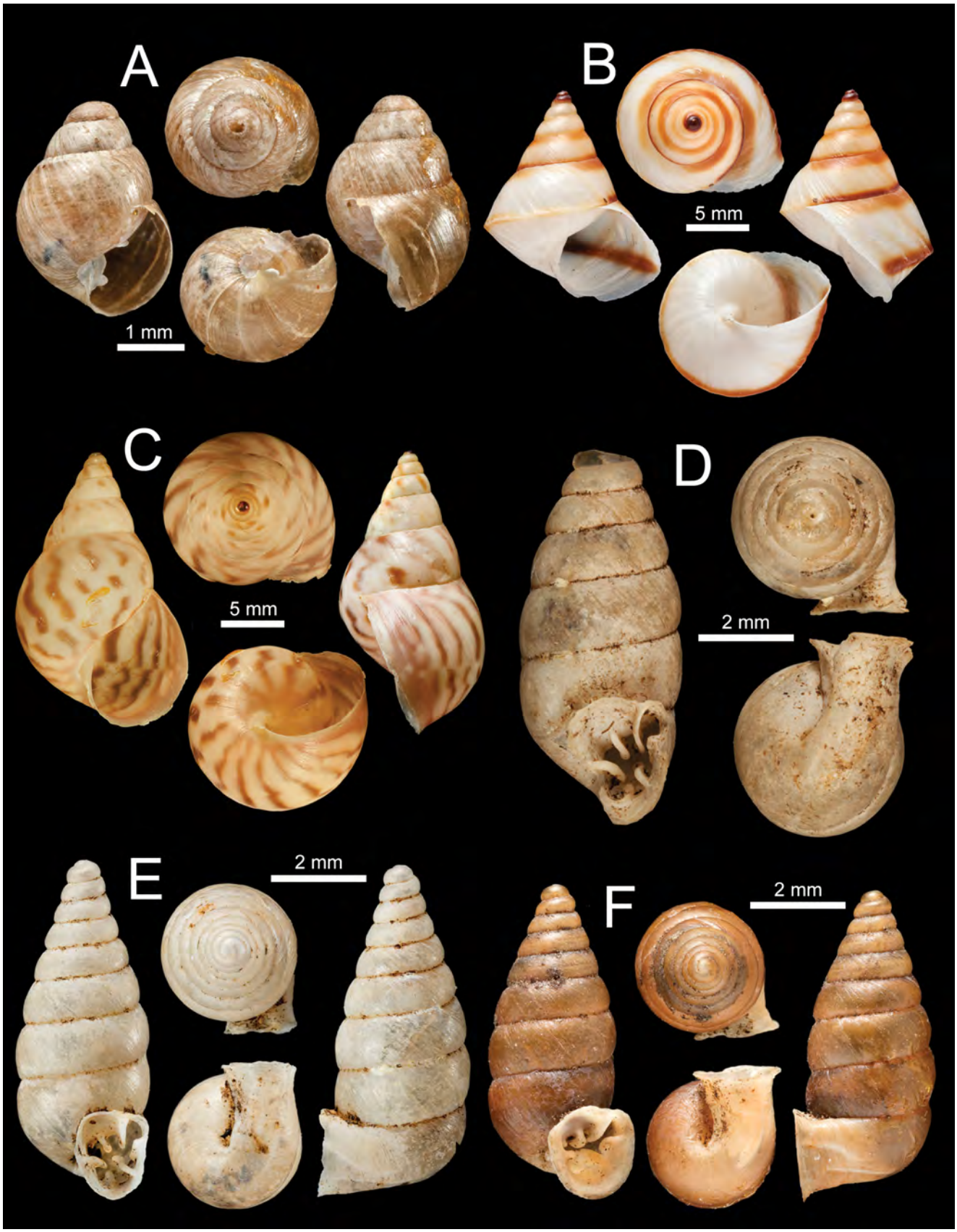


FIGURE 67. **A.** *Tornatellina cernica* Benson, 1850 (UMZC I.104940.A, neotype). **B.** *Bulimus arenicola* Benson, 1856 (UMZC I.104930, syntype). **C.** *Bulimus sanguineus* Benson, 1857 (UMZC I.102815.A, syntype). **D–E.** *Pupa layardi* Benson, 1856 (D: UMZC I.102925.A, holotype; E: UMZC I.102925.B, Benson collection). **F.** *Pupa layardi* var. *minor* Benson, 1864 (UMZC I.102920.A, syntype).

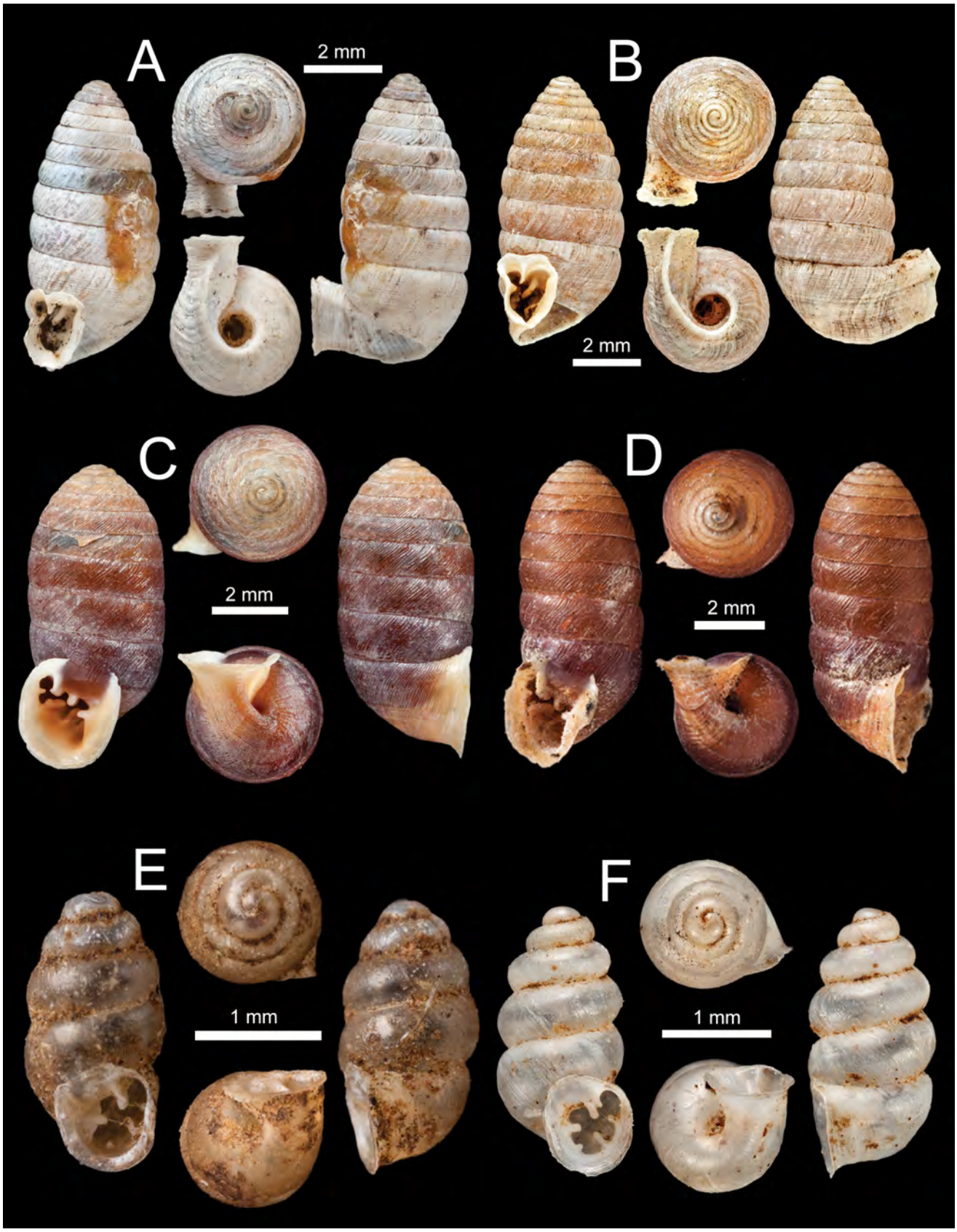


FIGURE 68. **A–B.** *Pupa fryana* Benson, 1864 (A: UMZC I.104965.A, syntype; B: NHMUK 1937.12.30.2835, Connolly collection). **C–D.** *Pupa pamphorodon* Benson, 1864 (C: UMZC I.104980.A, syntype; D: NHMUK 1912.8.16.294, E. Layard collection). **E.** *Pupa acarus* Benson, 1856 (NHMUK 1912.8.16.370, neotype). **F.** *Pupa avanica* Benson, 1863 (NHMUK 1906.2.2.187/1, neotype).

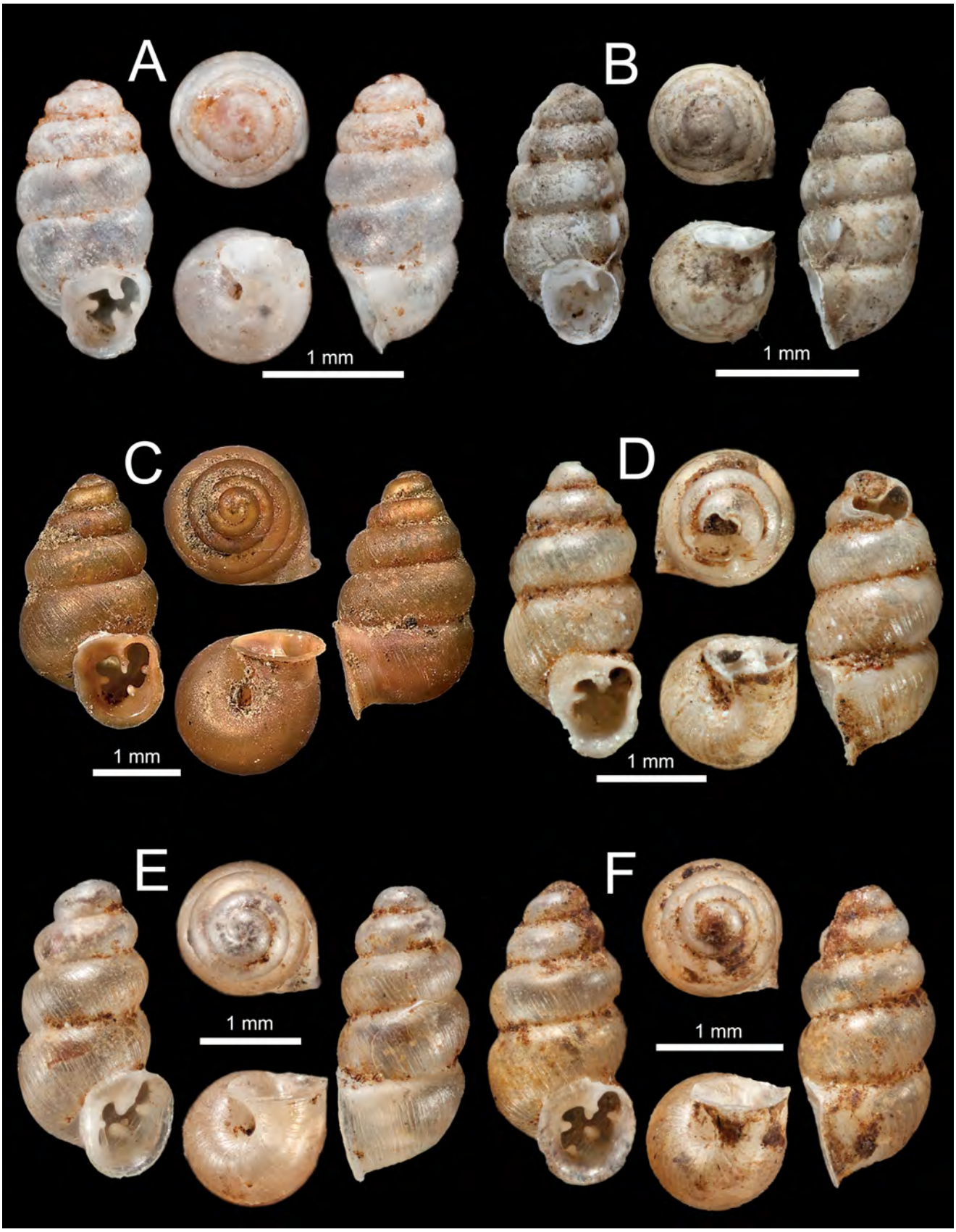


FIGURE 69. **A.** *Pupa huttoniana* Benson, 1849 (UMZC I.102345.B, lectotype). **B.** *Pupa thibetica* Benson, 1864 (NHMUK 1857.3.11.25/1, syntype). **C.** *Pupa bathyodon* Benson, 1863 (NHMUK 19991573, lectotype). **D.** *Pupa serrula* Benson, 1863 (UMZC I.104910, holotype). **E–F.** *Pupa mimula* Benson, 1853 (E: UMZC I.104480.A, syntype; F: NHMUK 1912.8.16.327, E.L. Layard collection).

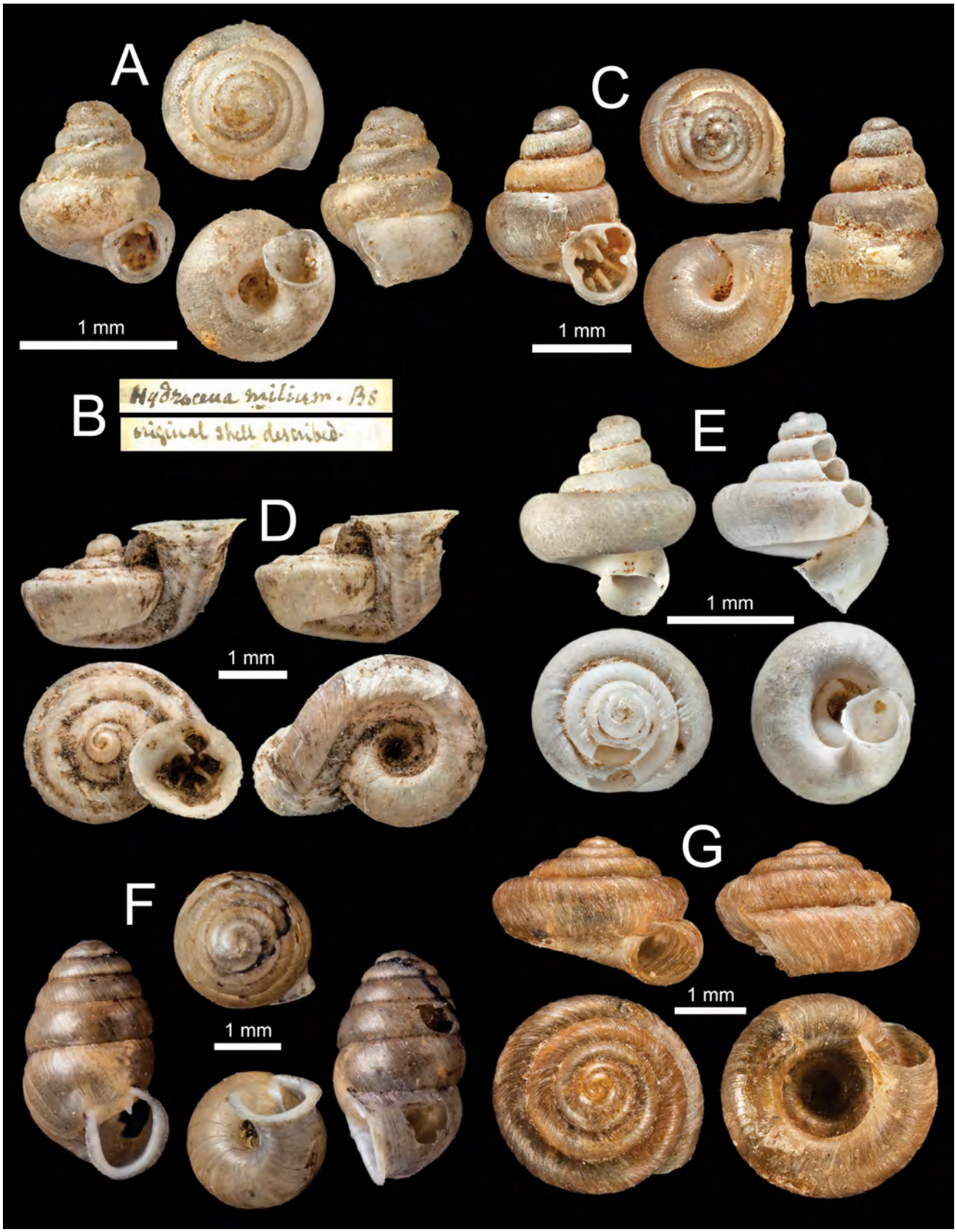


FIGURE 70. A–B. *Cyclostoma milium* Benson, 1853 (A: UMZC I.103805, syntype; B: label associated with A). **C.** *Pupa plicidens* Benson, 1849 (UMZC I.102325.A, syntype). **D.** *Tanystoma tubiferum* Benson, 1856 (NHMUK 1954.6.2.568, syntype). **E.** *Clostophis sankeyi* Benson, 1860 (UMZC I.103320, holotype). **F.** *Pupa dadion* Benson, 1864 (NHMUK 1912.8.16.373-375, syntype). **G.** *Helix humilis* Benson, 1838 (UMZC I.102010.A, lectotype).

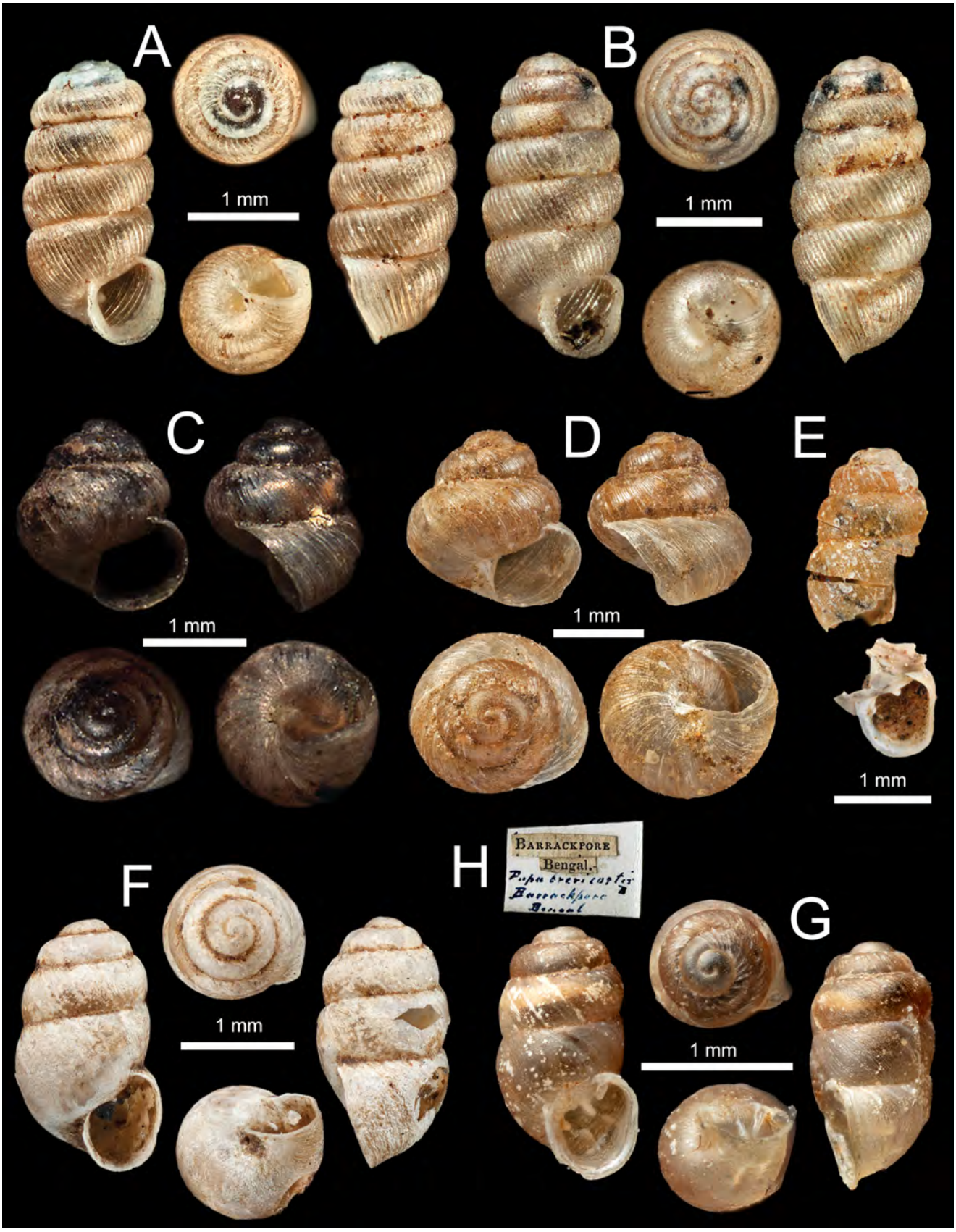


FIGURE 71. **A.** *Pupa riveriana* Benson, 1854 (UMZC I.103860.A, syntype). **B.** *Pupa himalayana* Benson, 1863 (UMZC I.104385.A, syntype). **C.** *Helix miccyla* Benson, 1860 (UMZC I.103315, syntype). **D.** *Helix orcula* Benson, 1850 (UMZC I.103765.A). **E.** *Pupa seriola* Benson, 1863 (NHMUK 20180579, H.F. Blanford collection). **F.** *Pupa diopsis* Benson, 1863 (NHMUK 1888.12.4.691, holotype). **G–H.** *Pupa brevicostis* Benson, 1849 (G: UMZC I.102320.A, syntype; H. original Benson label).

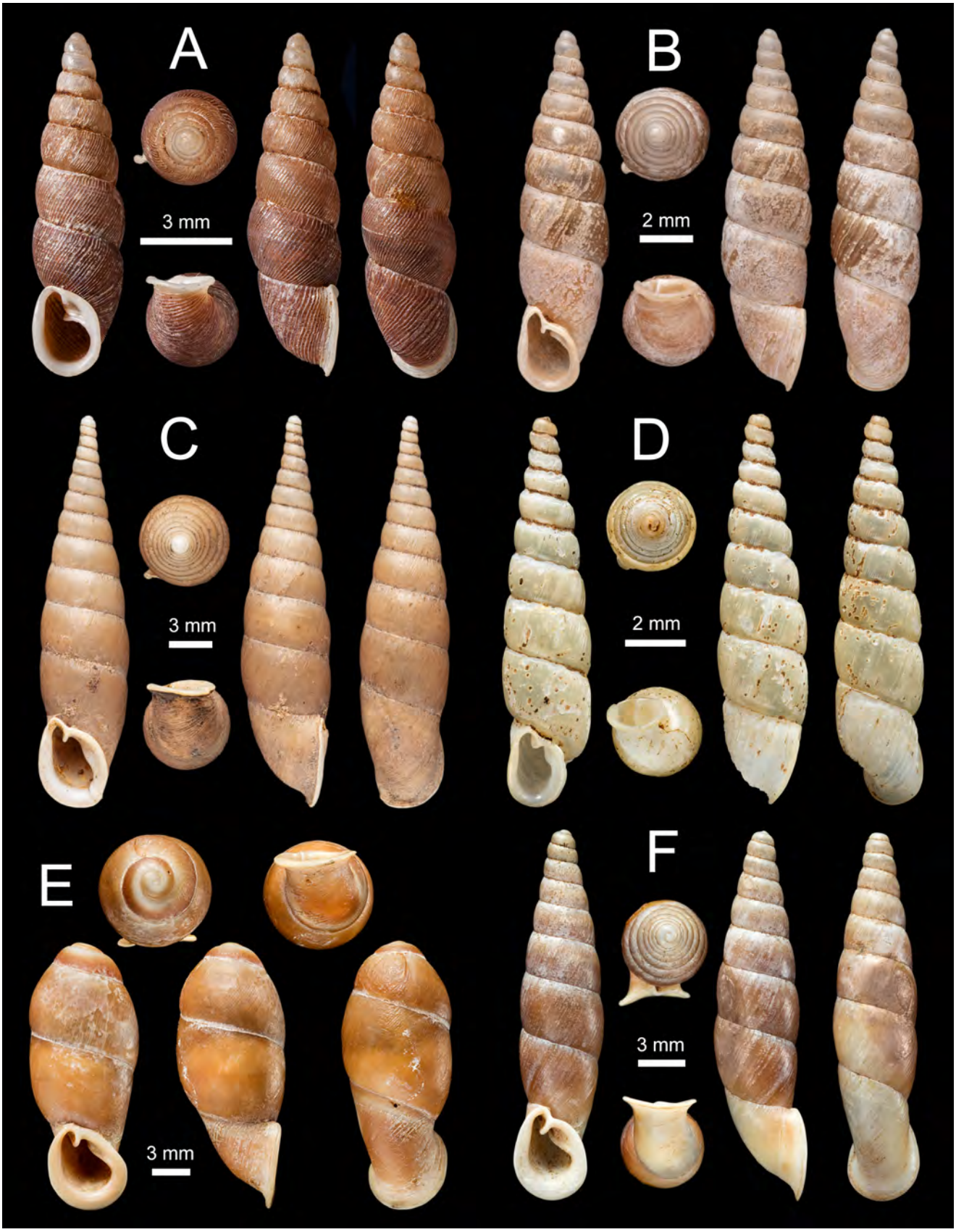


FIGURE 72. **A.** *Clausilia ceylanica* Benson, 1863 (NHMUK 1954.6.2.1062, neotype). **B.** *Clausilia aculus* Benson, 1842 (OUMNH.ZC.MO25557-01, lectotype). **C.** *Clausilia pluviatilis* Benson (NHMUK 1842.9.30.21, syntype). **D.** *Clausilia Iös* Benson, 1852 (UMZC I.103825.A, syntype). **E.** *Clausilia bulbus* Benson, 1863 (UMZC I.103230, syntype). **F.** *Clausilia loxostoma* Benson, 1836 (UMZC I.102030.A, lectotype).

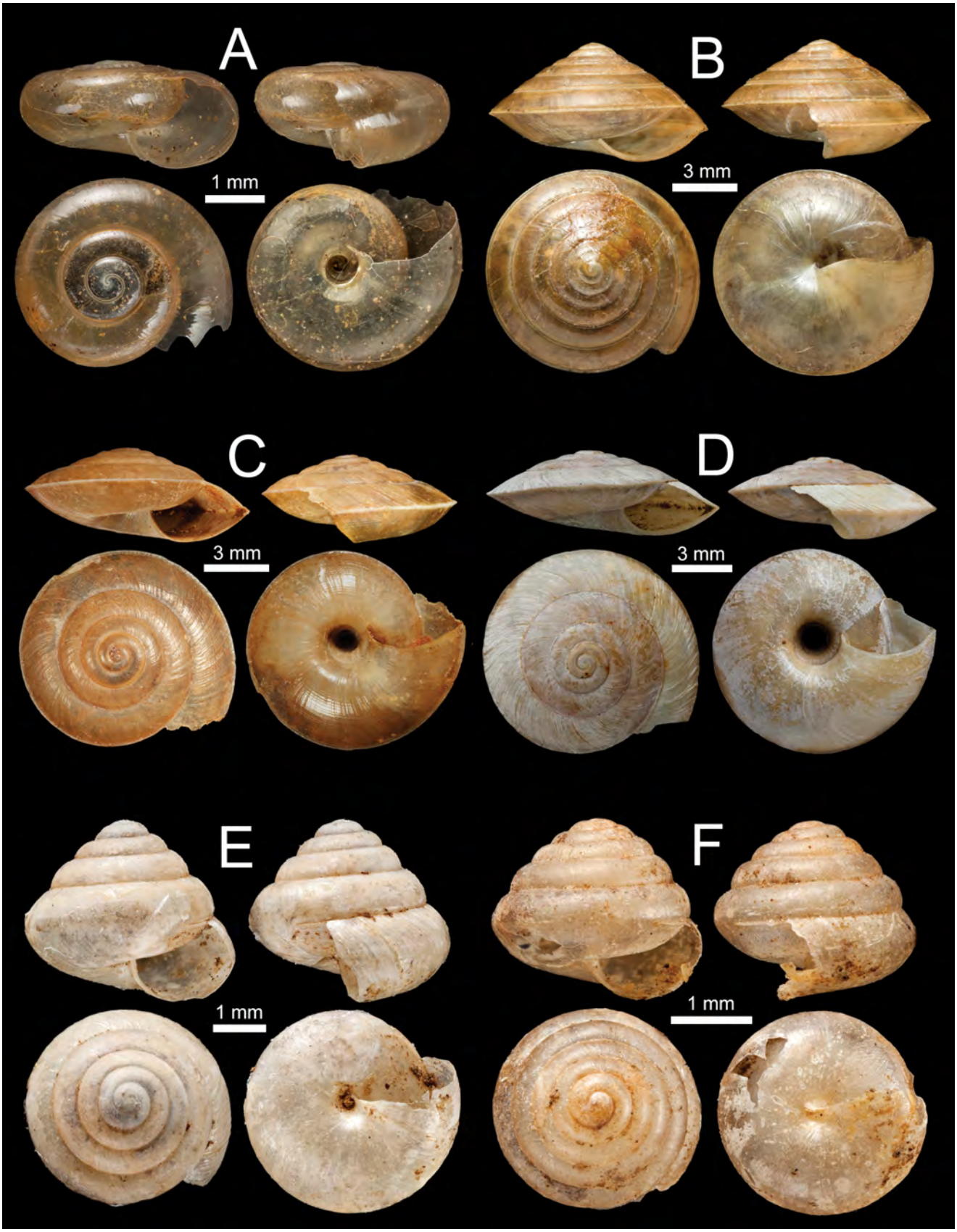


FIGURE 73. **A.** *Helix remota* Benson, 1851 (NHMUK 1912.8.16.362-364, syntype). **B.** *Helix lychnia* Benson, 1852 (UMZC I.104450.A, syntype). **C.** *Helix cantoriana* Benson, 1861 (UMZC I.104260, holotype). **D.** *Helix sanis* Benson, 1861 (UMZC I.103140.A, neotype). **E.** *Helix bullula* Benson, 1838 (UMZC I.102005.A, syntype). **F.** *Helix nana* Benson, 1838 (UMZC I.102060, McAndrew collection).

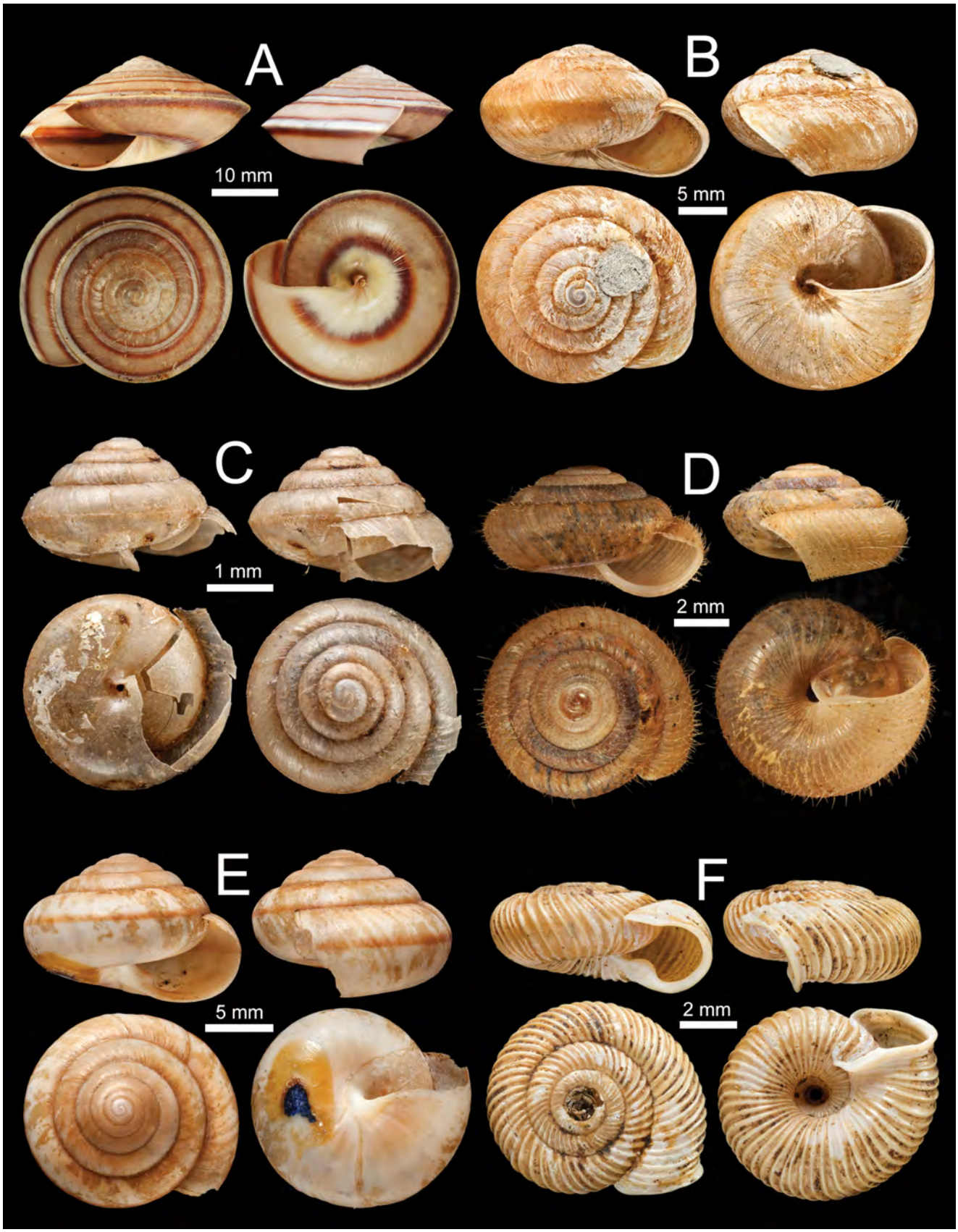


FIGURE 74. **A.** *Helix regalis* Benson, 1850 (UMZC I.104710.A, McAndrew collection). **B.** *Helix naninoides* Benson, 1842 (NHMUK 1842.9.30.2, syntype). **C.** *Helix barclayi* Benson, 1850 (UMZC I.100035, lectotype). **D.** *Helix setiliris* Benson, 1859 (UMZC I.104865.A, syntype). **E.** *Helix albidens* Benson, 1853 (UMZC I.104045.A, syntype). **F.** *Helix caldwelli* Benson, 1859 (UMZC I.104255.A, syntype).

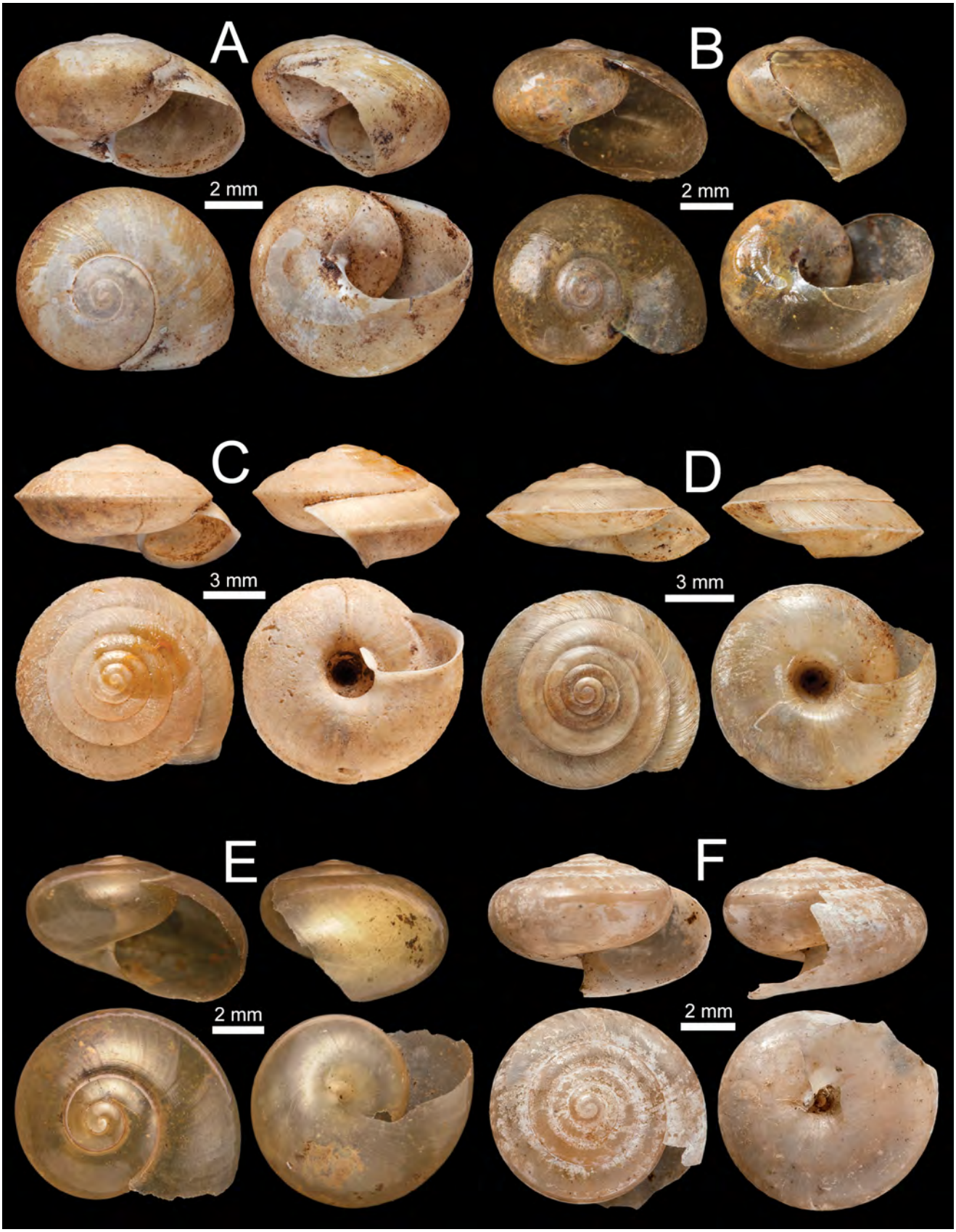


FIGURE 75. **A.** *Helix levicula* Benson, 1859 (NHMUK 1888.12.4.506, holotype). **B.** *Vitrina salius* Benson, 1859 (UMZC I.102705, syntype). **C.** *Helix castra* Benson, 1852 (UMZC I.103925, syntype). **D.** *Helix galerus* Benson, 1856 (UMZC I.103055, Benson collection). **E.** *Helix regulata* Benson, 1860 (UMZC I.103308.A, syntype). **F.** *Helix vilipensa* Benson, 1853 (UMZC I.103965, lectotype).

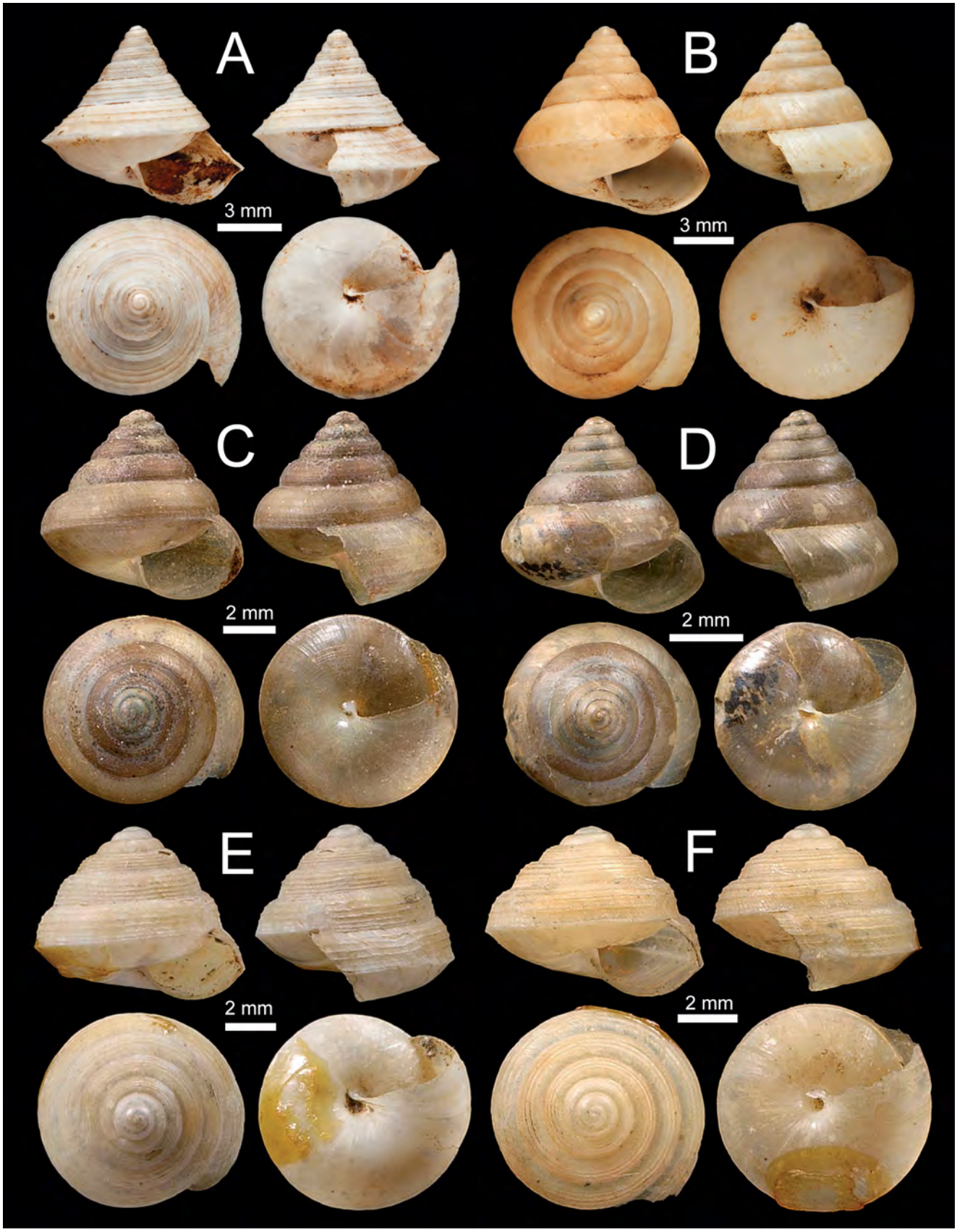


FIGURE 76. **A.** *Helix arx* Benson, 1859 (UMZC I.102575.A, neotype). **B.** *Helix attegia* Benson, 1859 (UMZC I.102475.A, syntype). **C–D.** *Helix turbiniformis* Benson, 1838 (C: UMZC 102405.A, lectotype; D: UMZC I.102405.B, paralectotype). **E–F.** *Helix palmaria* Benson, 1864 (E: UMZC I.103075.A, lectotype; F: NHMUK 1906.3.3.66, paralectotype).

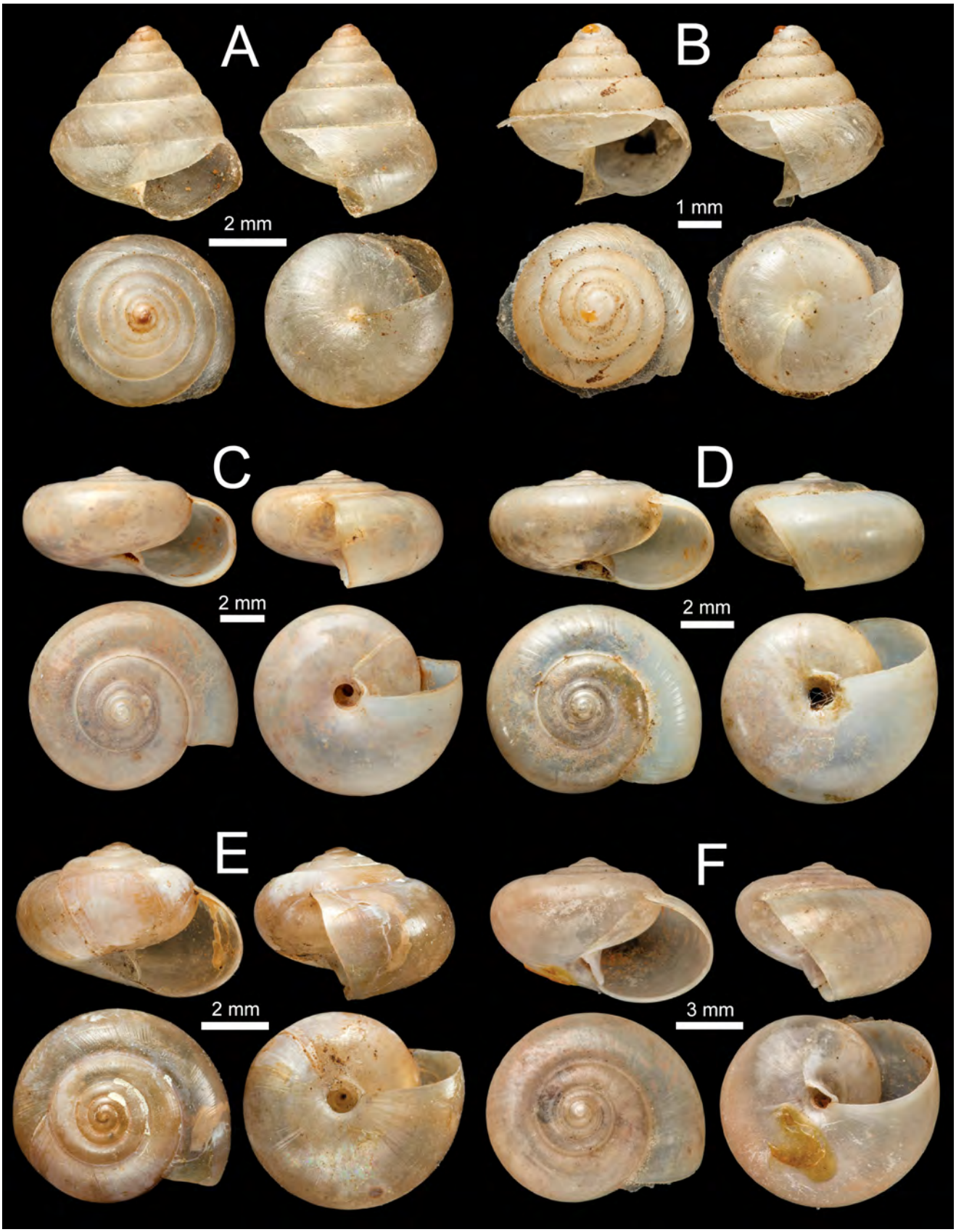


FIGURE 77. **A.** *Helix phyllophila* Benson, 1863 (UMZC I.103290.A, McAndrew collection). **B.** *Helix rimicola* Benson, 1859 (UMZC I.102685.A). **C–D.** *Helix calias* Benson, 1859 (C: UMZC I.102715.A, syntype; D: UMZC I.102680.A, R. McAndrew collection). **E.** *Helix forabilis* Benson, 1859 (UMZC I.102515.A, Benson collection). **F.** *Helix schistostelis* Benson, 1859 (UMZC I.102480.A, syntype).

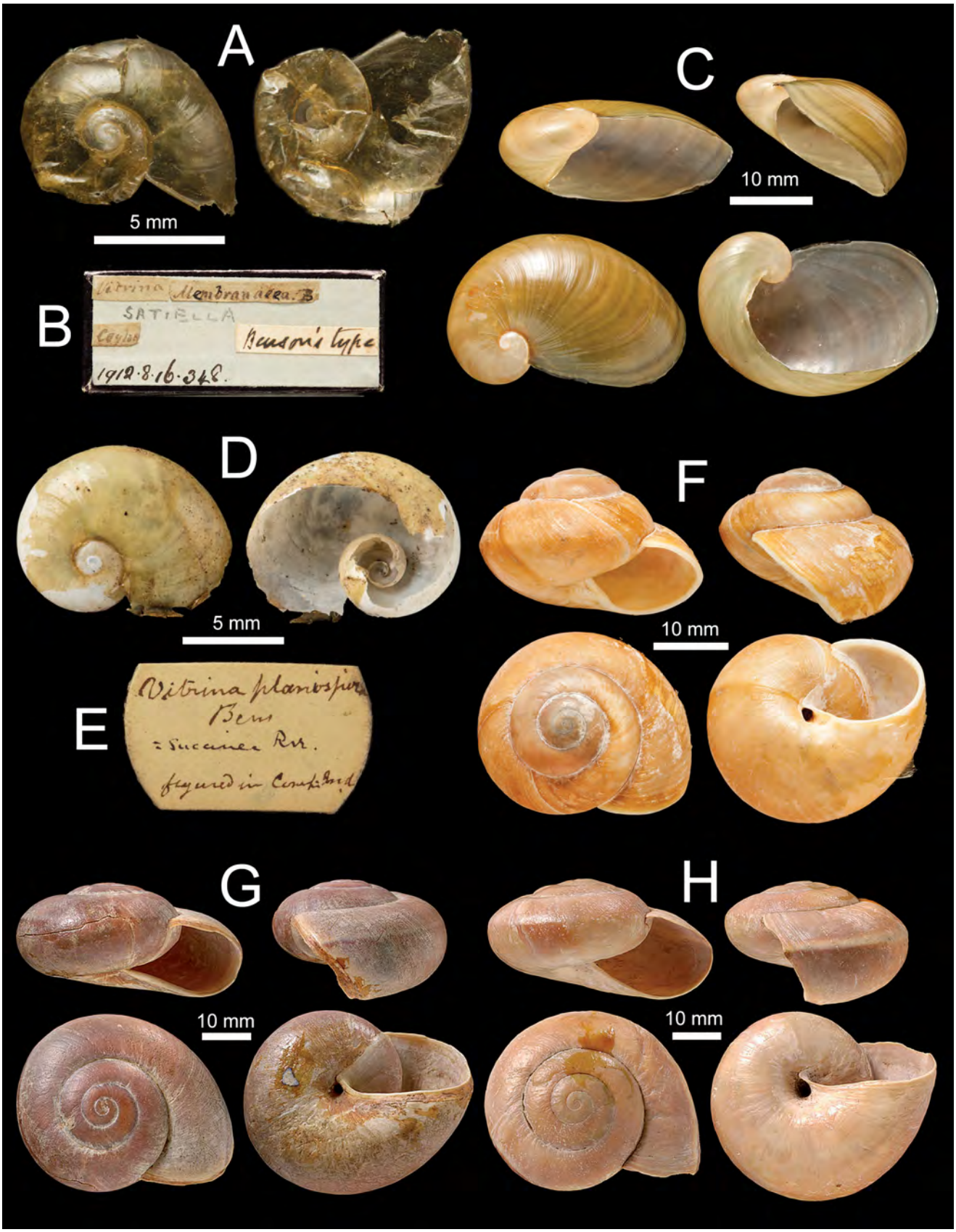


FIGURE 78. **A–B.** *Vitrina membranacea* Benson, 1853 (A: NHMUK 1912.8.16.348, syntype; B: label that accompanies A). **C.** *Vitrina gigas* Benson, 1836 (UMZC I.102110.A, syntype). **D–E.** *Vitrina planospira* Benson, 1859 (D: NHMUK 1906.1.1.12, syntype; E: label that accompanies D). **E.** *Helix haughtoni* Benson, 1863 (UMZC I.104355.A, syntype). **F–G.** *Helix basilessa* Benson, 1865 (F: UMZC I.103420.A, lectotype; G: UMZC I.103420.B, paralectotype).

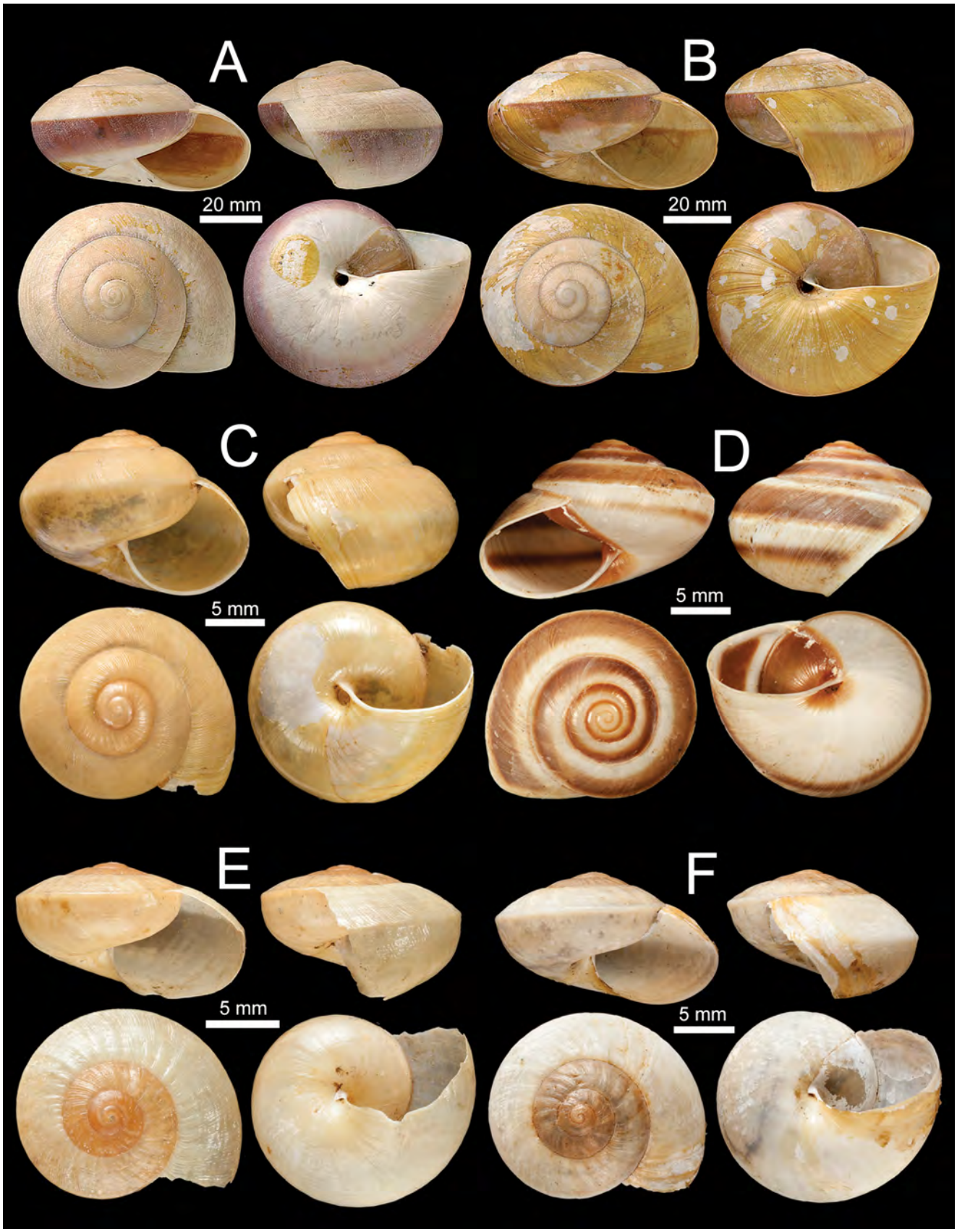


FIGURE 79. A–B. *Helix basileus* Benson, 1861 (A: UMZC I.103430.A, holotype; B: UMZC I.103430.B, Benson collection). **C.** *Helix cyix* Benson, 1860 (UMZC I.104315.A, syntype). **D.** *Helix laidlayana* Benson, 1856 (UMZC I.102860.A, syntype). **E–F.** *Helix ceraria* Benson, 1853 (E: UMZC I.103955.A, syntype; F: UMZC I.103955.B, syntype).

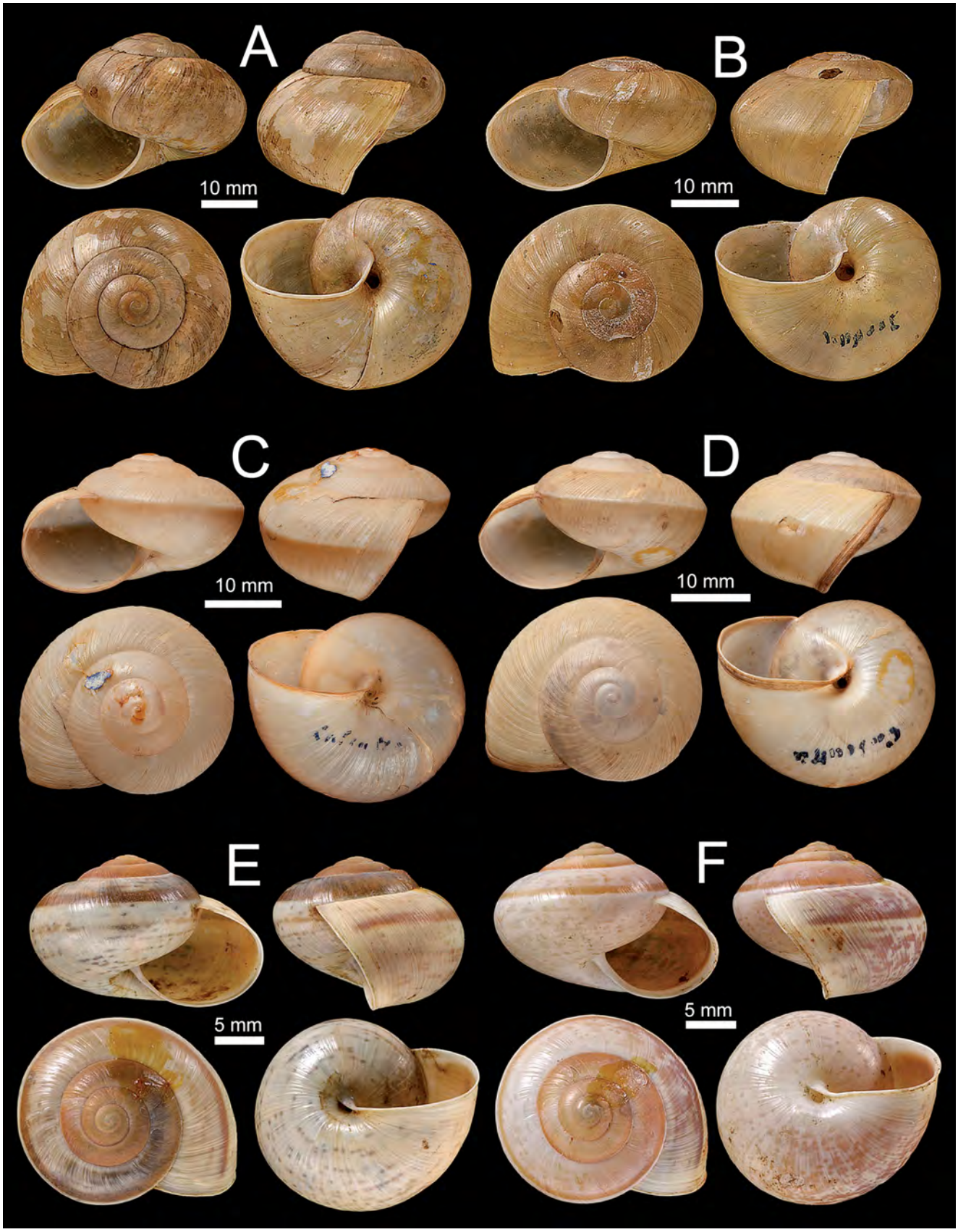


FIGURE 80. **A–B.** *Helix cysis* Benson, 1852 (A: UMZC I.103895.A, lectotype; B: UMZC I.103895.B paralectotype). **C–D.** *Helix interrupta* Benson, 1834 (C: UMZC I.102100.A, lectotype; D: UMZC I.102100.B, paralectotype). **E–F.** *Helix solata* Benson, 1848 (E: UMZC I.102420.A, lectotype; F: UMZC I.102420.B, paralectotype).

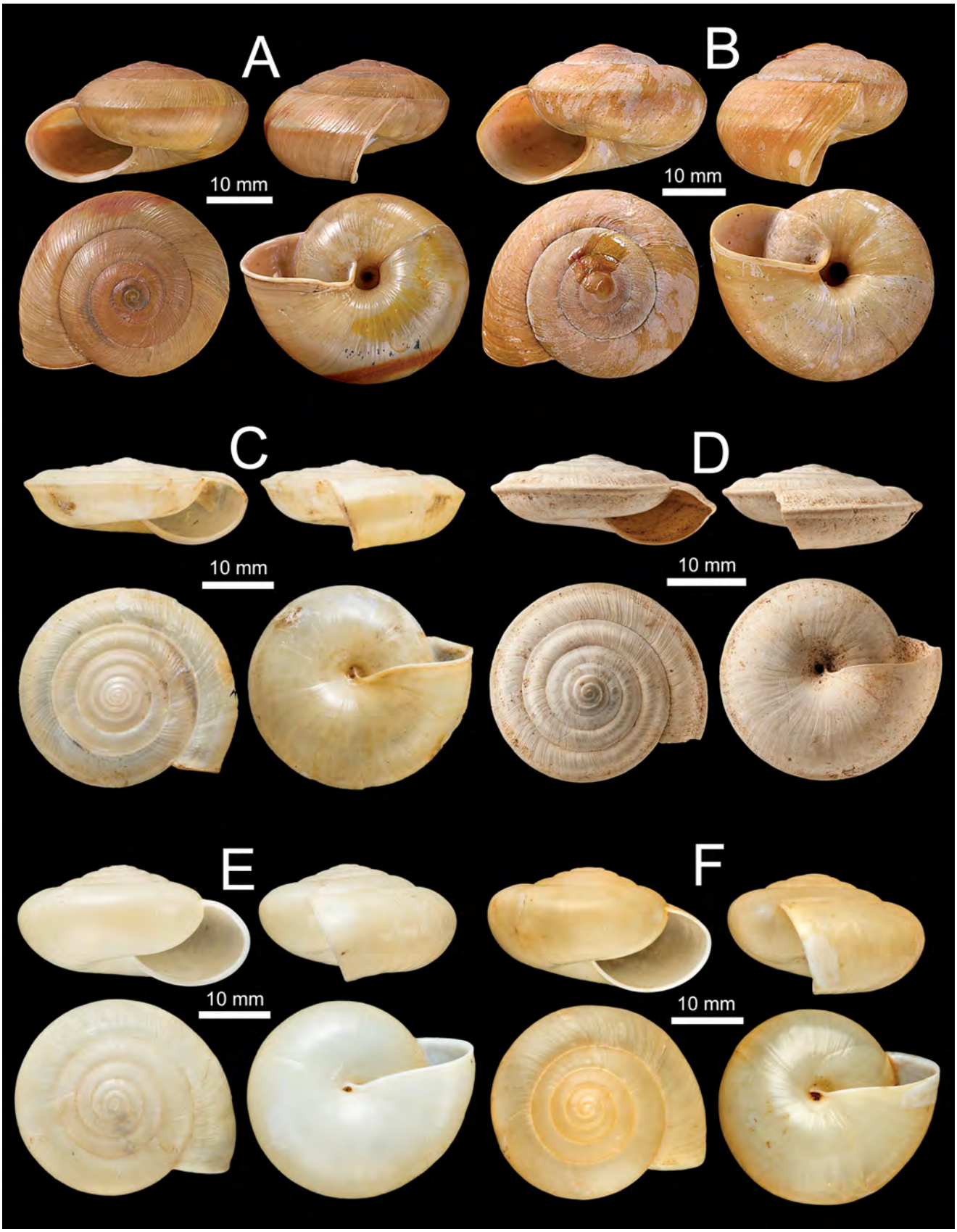


FIGURE 81. A–B. *Helix thyreus* Benson, 1852 (A: UMZC I.103905.A, lectotype; B: UMZC I.103905.B, paralectotype). **C–D.** *Helix gordoniae* Benson, 1863 (C: UMZC I.103415, lectotype; D: NHMUK 1954.6.2.295, syntype?). **E–F.** *Helix textrina* Benson, 1856 (E: UMZC I.103245.A, syntype; NHMUK 1888.12.4.1481-1483, Theobald collection).

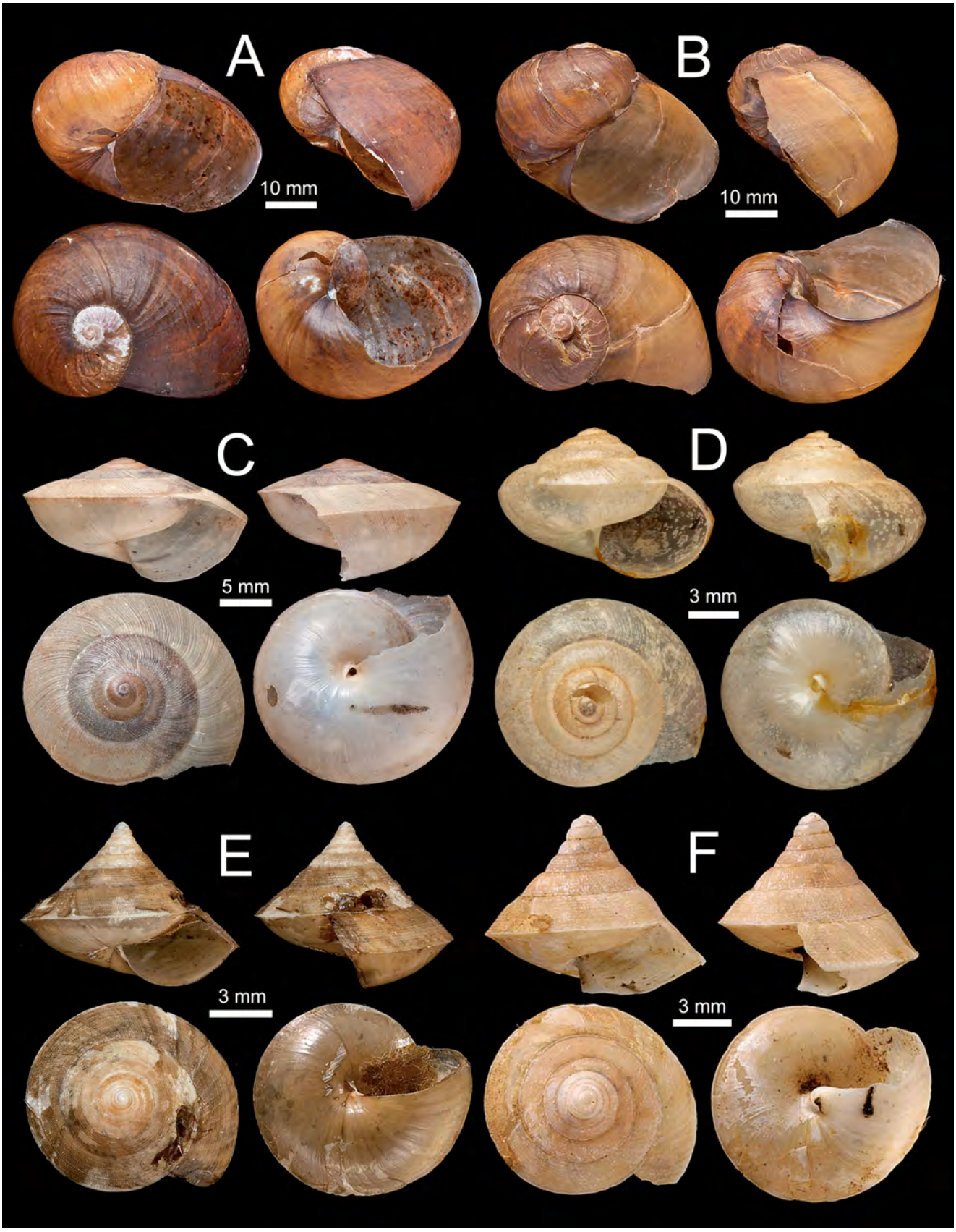


FIGURE 82. **A–B.** *Helix ampulla* Benson, 1850 (A: UMZC I.103585.A, lectotype; B: UMZC I.103585.B, paralectotype). **C.** *Helix acuducta* Benson, 1850 (UMZC I.103645, lectotype). **D.** *Helix baconi* Benson, 1850 (UMZC I.103700, holotype). **E–F.** *Helix cacuminifera* Benson, 1850 (E: UMZC I.103600.A, lectotype; F: UMZC I.103600.B, paralectotype).

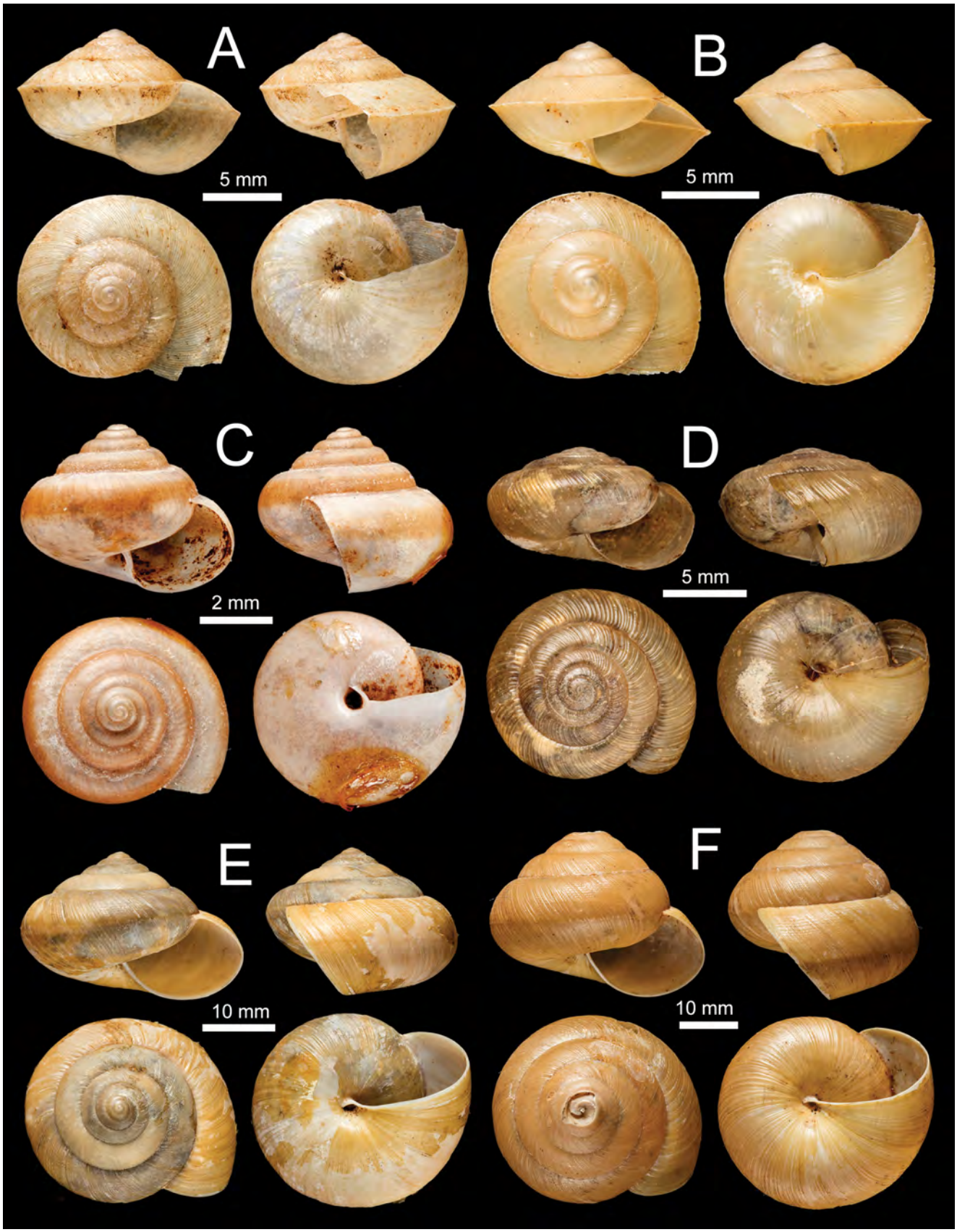


FIGURE 83. **A–B.** *Helix cingalensis* Benson, 1860 (A: UMZC I.103520.A, syntype; B: UMZC I.103520.B, syntype). **C.** *Helix cassidula* Benson, 1859 (UMZC I.104235, syntype). **D.** *Helix marcida* Benson, 1853 (NHMUK 1912.8.16.300-302, E.L. Layard collection). **E–F.** *Helix rosamonda* Benson, 1860 (E: UMZC I.103526.A, syntype; F: UMZC I.103527, syntype).

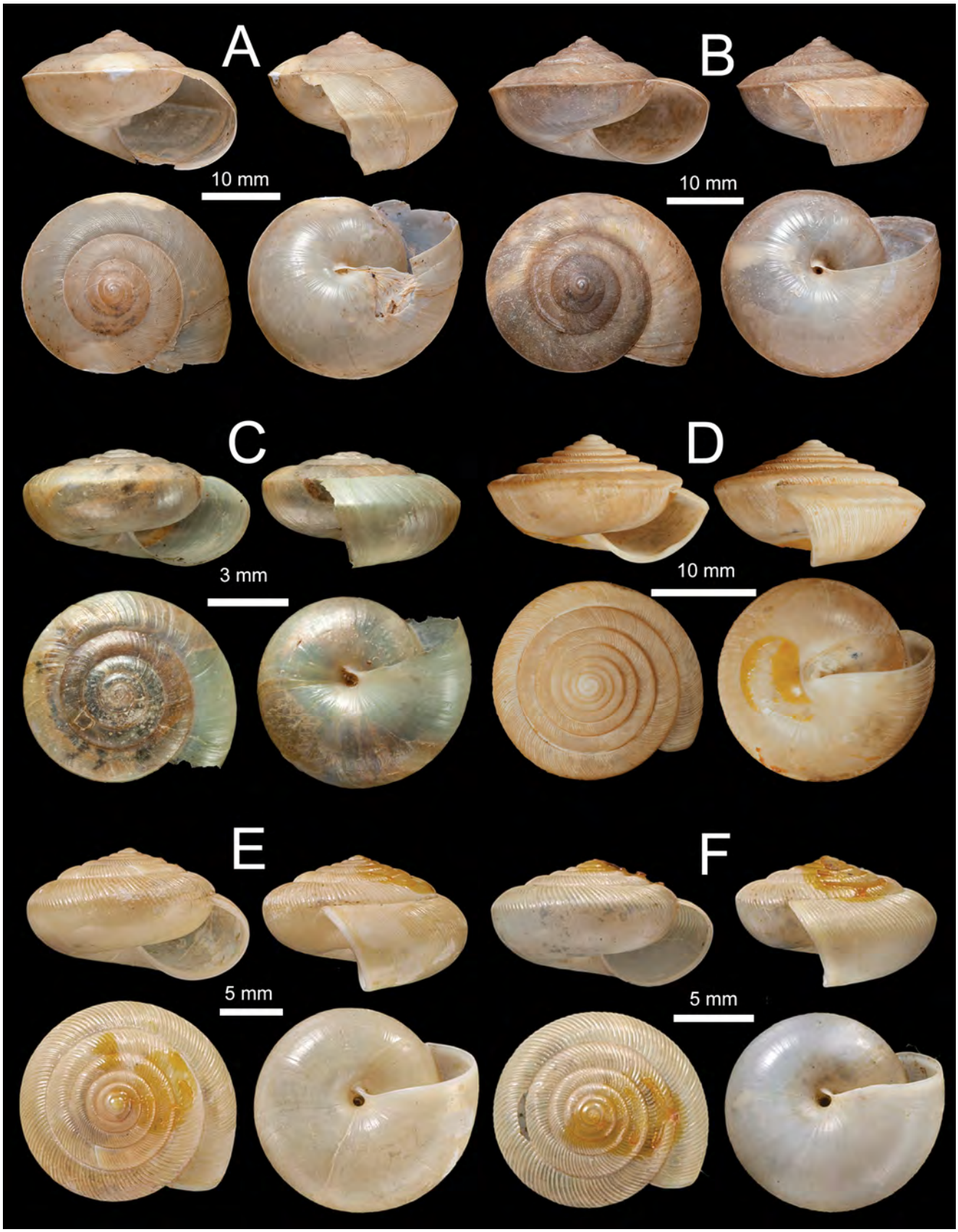


FIGURE 84. A–B. *Helix travancorica* Benson, 1865 (A: UMZC I.103530.A, holotype; B: UMZC I.103530.B, Benson collection). **C.** *Helix chloroplax* Benson, 1865 (UMZC I.103260, holotype). **D.** *Helix climacterica* Benson, 1836 (UMZC I.102025.A, holotype). **E–F.** *Helix ornatissima* Benson, 1859 (E: UMZC I.102500.A, syntype; F: UMZC I.102500.B, syntype).

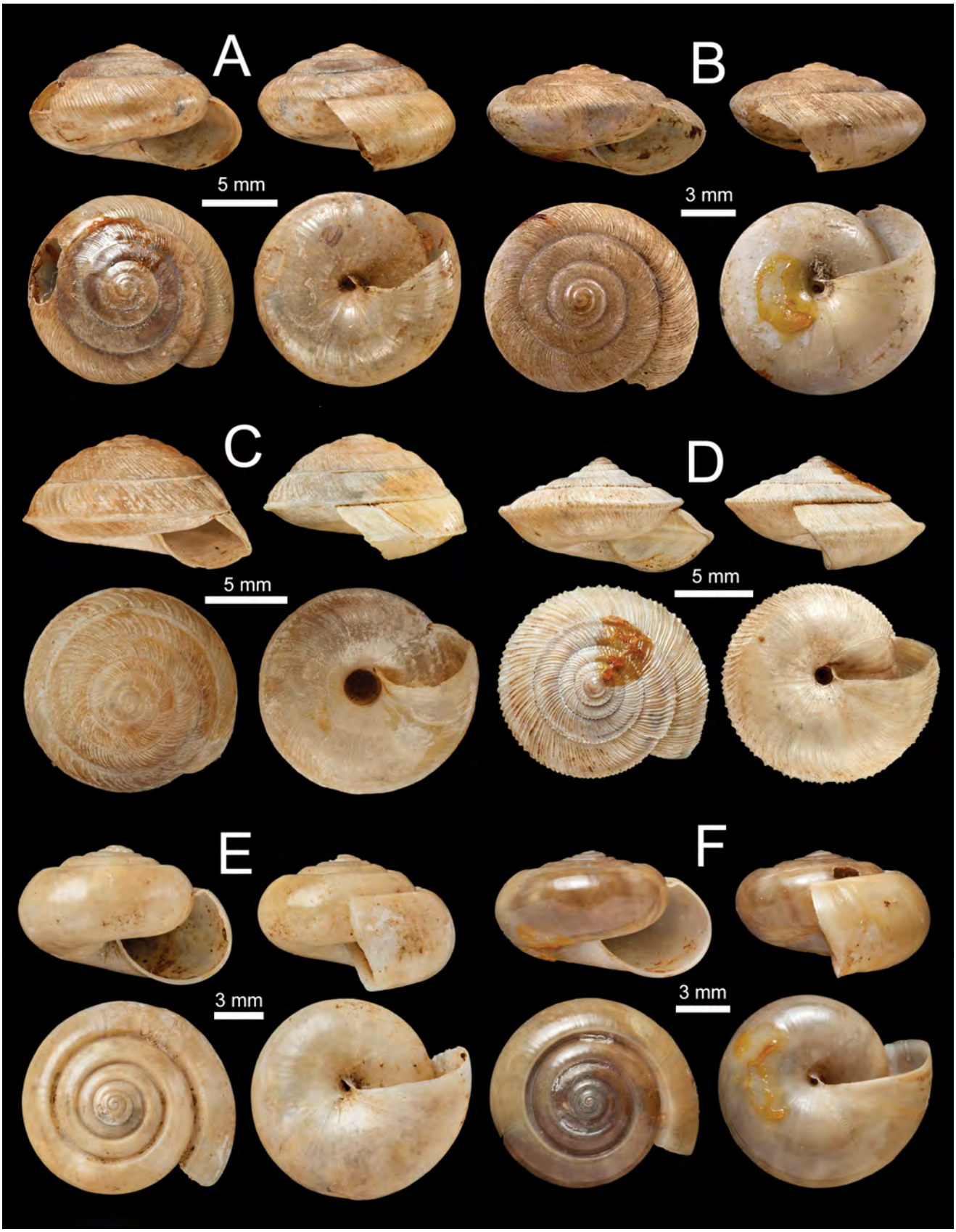


FIGURE 85. **A–B.** *Helix pansa* Benson, 1856 (A: UMZC I.102970.A, syntype; B: UMZC I.102970.B, syntype). **C.** *Helix hyba* Benson, 1861 (UMZC I.103435.A, syntype). **D.** *Helix serrula* Benson, 1836 (UMZC I.102090.A, Benson collection). **E–F.** *Helix convallata* Benson, 1856 (E: NHMUK 1888.12.4. 2080, neotype; UMZC I.102890.A, Benson collection).

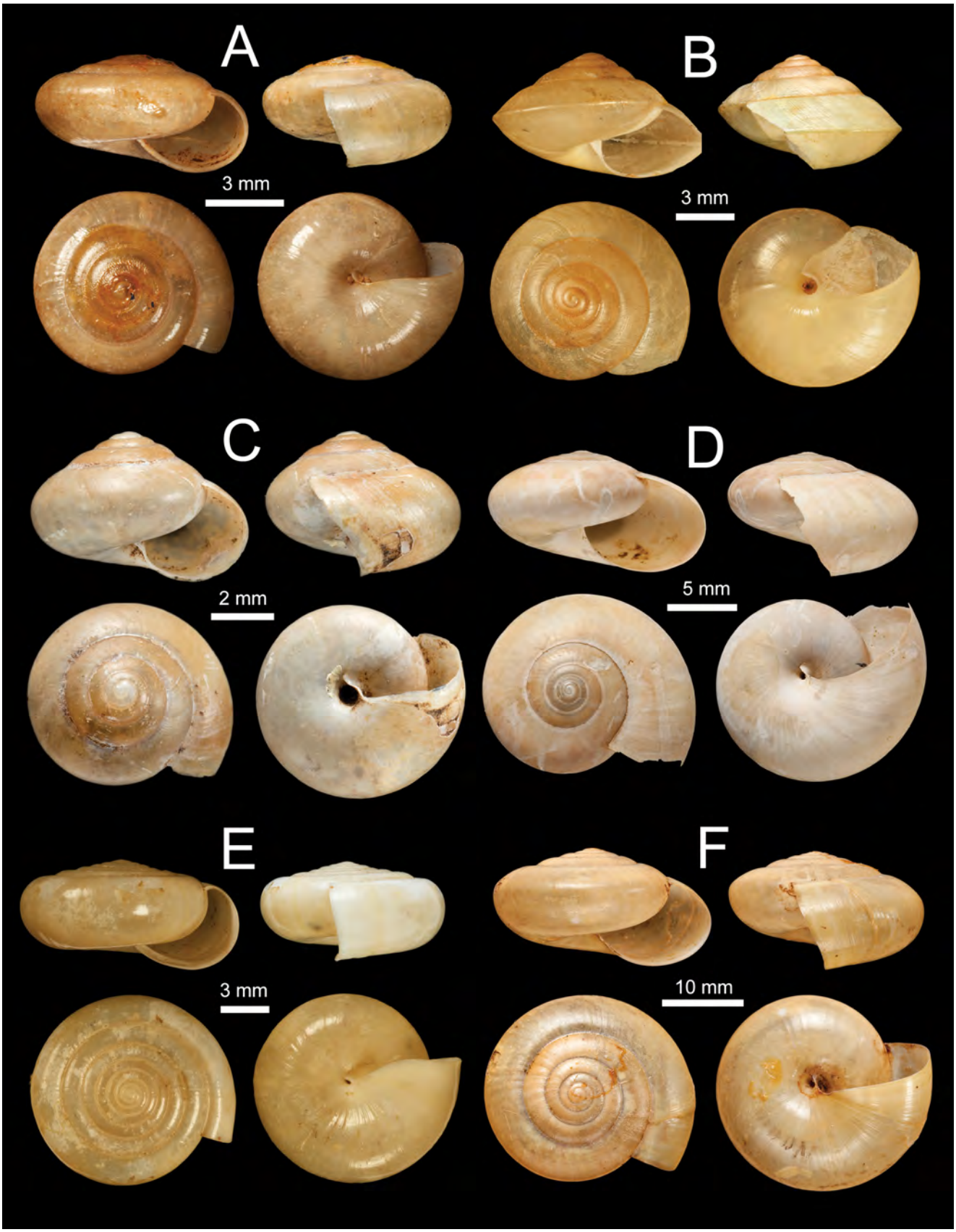


FIGURE 86. **A.** *Helix aspides* Benson, 1863 (UMZC I.103795.A, neotype. **B.** *Helix aulopis* Benson, 1863 (UMZC I.103355.A, holotype). **C.** *Helix causia* Benson, 1859 (UMZC I.102465.A, syntype). **D.** *Helix choinix* Benson, 1861 (UMZC I.103440.A, syntype). **E.** *Helix consepta* Benson, 1860 (NHMUK 1888.12.4.2052, neotype). **F.** *Nanina decussata* Benson, 1836 (UMZC I.102015.A, syntype).

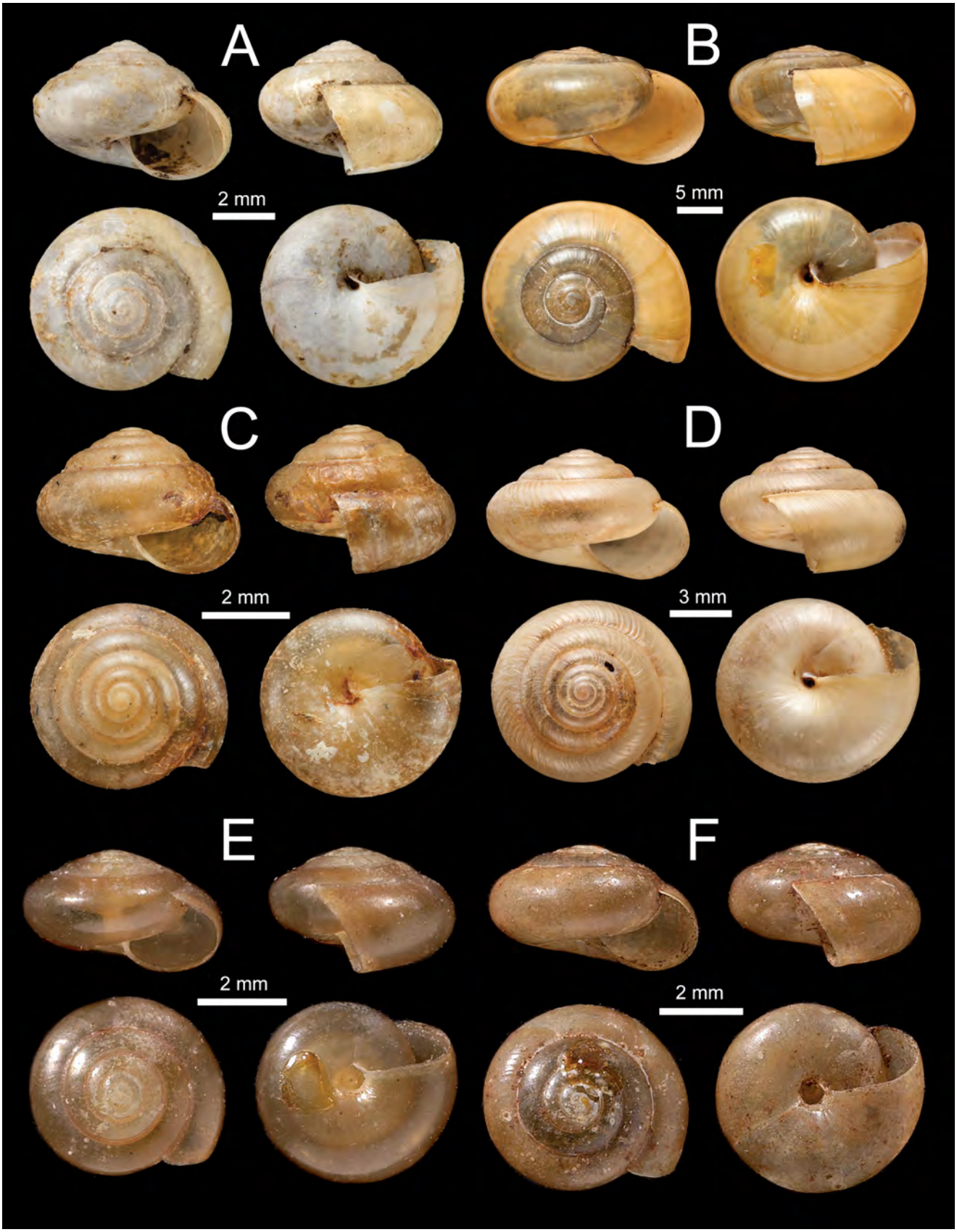


FIGURE 87. **A.** *Helix hodgsoni* Benson, 1859 (NHMUK 1906.1.1.18, holotype). **B.** *Helix lubrica* Benson, 1852 (UMZC I.103900.A, syntype). **C.** *Helix molecula* Benson, 1859 (UMZC I.102510.A, syntype). **D.** *Helix patane* Benson, 1859 (NHMUK 1906.1.1.63, holotype). **E–F.** *Helix neherensis* Benson, 1864 (E: UMZC I.103240.B, lectotype; F: UMZC I.103240.A, paralectotype).

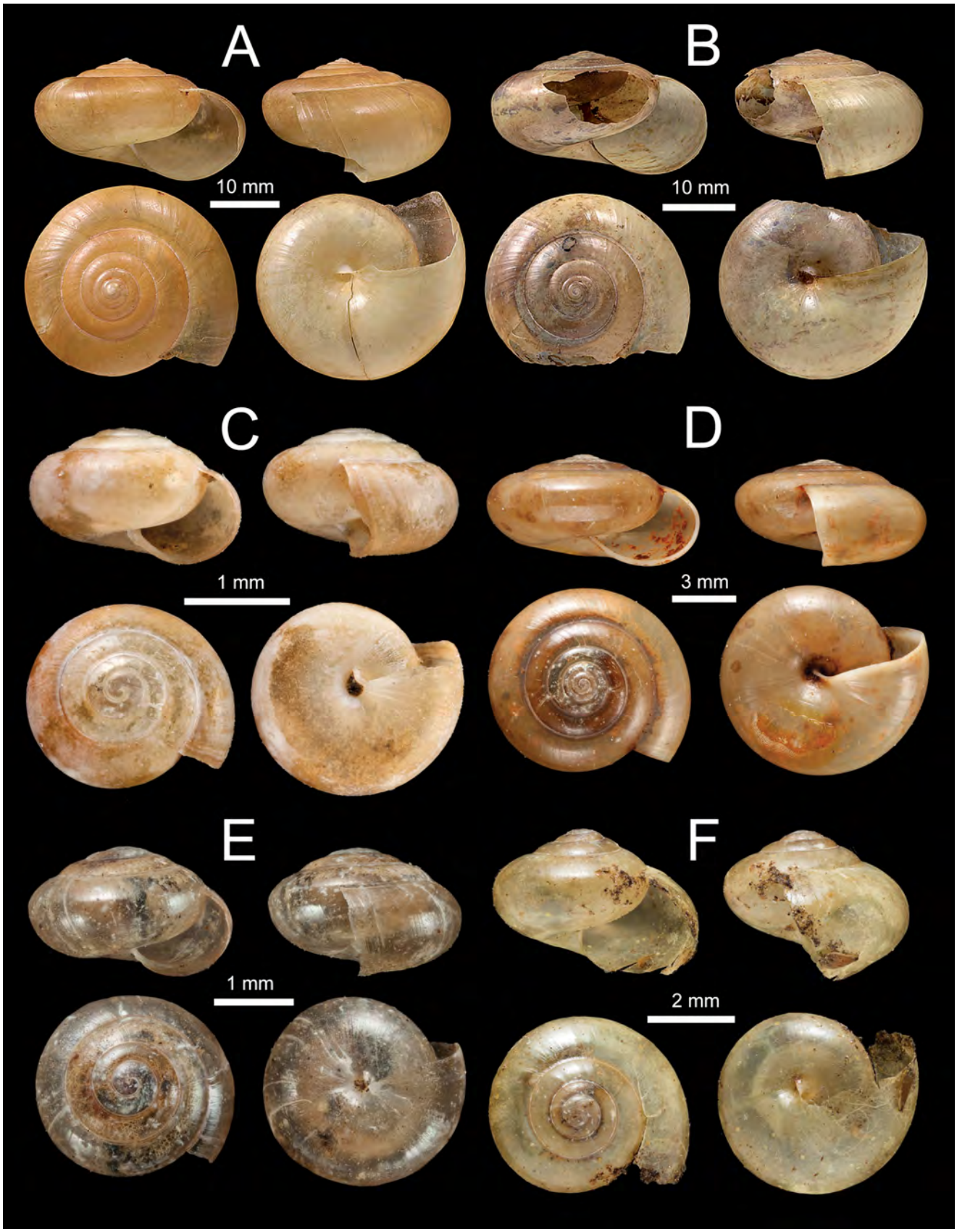


FIGURE 88. **A–B.** *Helix pedina* Benson, 1865 (A: UMZC I.103085, lectotype; B: UMZC I.103080, paralectotype). **C.** *Helix pauxillula* Benson, 1859 (UMZC I.102495.A, syntype). **D.** *Helix petasus* Benson, 1859 (UMZC I.102720.A, syntype). **E.** *Helix planiuscula* Benson, 1838 (UMZC I.102095.A, syntype). **F.** *Helix rorida* Benson, 1859 (UMZC I.102565, syntype).

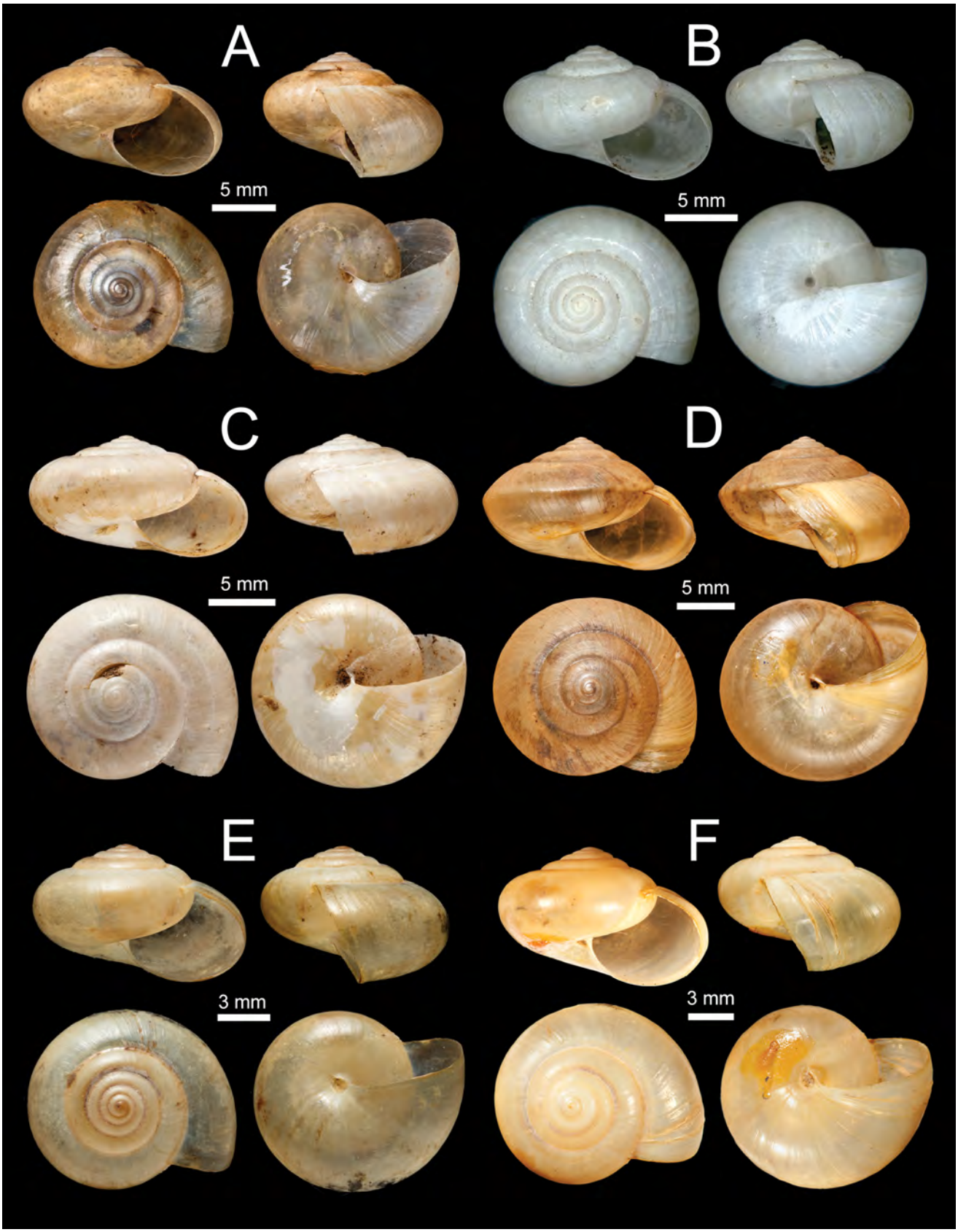


FIGURE 89. **A–B.** *Helix subjecta* Benson, 1852 (A: UMZC I.105240, syntype; B: NZSI M.3656/1, Asiatic Society collection). **C.** *Helix sequax* Benson, 1859 (UMZC I.102750.A, syntype). **D.** *Helix tugurium* Benson, 1852 (UMZC I.103935.A, syntype). **E.** *Helix lecythis* Benson, 1852 (UMZC I.103880, syntype). **F.** *Nanina vesicula* Benson, 1838 (UMZC I.102190, syntype).

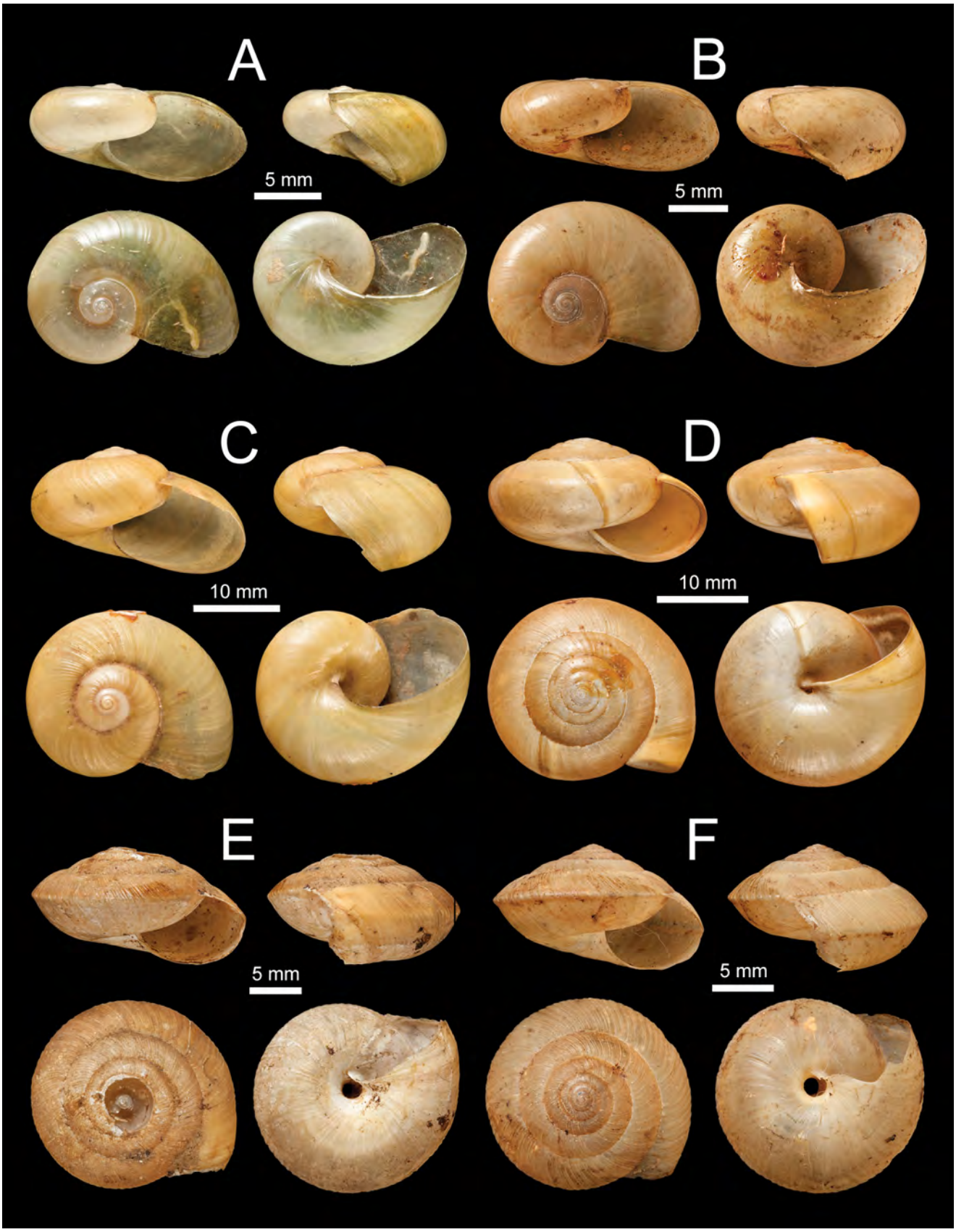


FIGURE 90. **A–B.** *Vitrina scutella* Benson, 1859 (A: UMZC I.102760, lectotype; B: NHMUK 1888.12.4.796, Theobald collection). **C.** *Helicarion cassida* Benson, 1838 (UMZC I.102080, syntype). **D.** *Nanina monticola* Benson, 1838 (UMZC I.102150.A, syntype). **E–F.** *Helix camura* Benson, 1859 (E: NHMUK 1906.2.2.73/1, neotype; F: NHMUK 1906.2.2.73/2, W.T. Blanford collection).

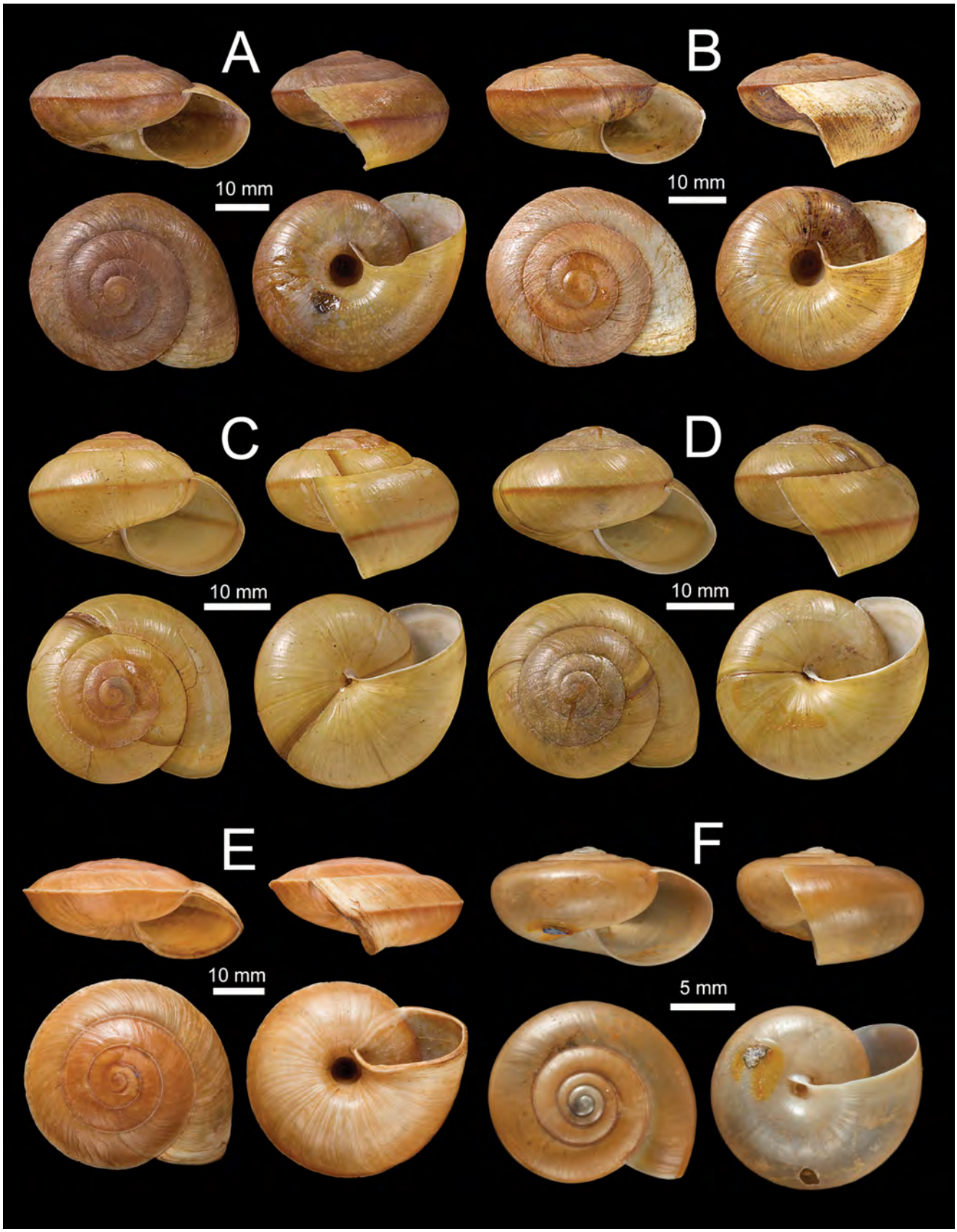


FIGURE 91. **A–B.** *Helix cycloplax* Benson, 1852 (UMZC I.103930.A, McAndrew collection; B: UMZC I.103930.B, McAndrew collection). **C–D.** *Helix orobia* Benson, 1848 (C: UMZC I.102410.A, syntype; D: UMZC I.102410.B, syntype). **E.** *Helix oxytes* Benson, 1836 (UMZC I.102145.A, syntype). **F.** *Helix acerra* Benson, 1859 (UMZC I.102545, Benson collection).

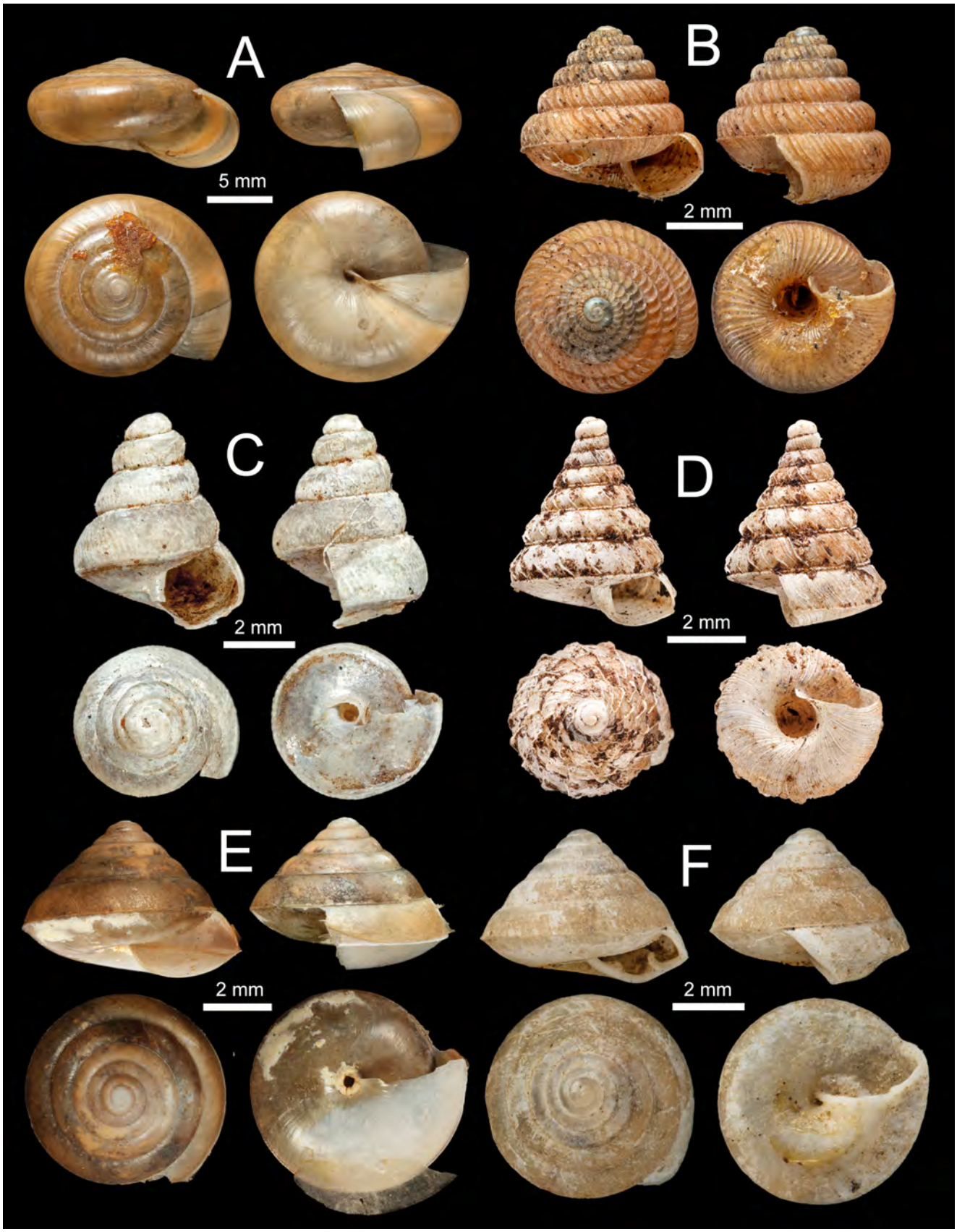


FIGURE 92. **A.** *Nanina splendens* Benson, 1838 (UMZC I.102065.A, syntype). **B.** *Helix bascauda* Benson, 1859 (NHMUK 1903.7.1.1703/1). **C.** *Helix corys* Benson, 1859 (NHMUK 1906.2.1.156, holotype). **D.** *Helix macropleuris* Benson, 1859 (NHMUK 1906.2.2.155/1, neotype). **E–F.** *Helix diplodon* Benson, 1859 (E: UMZC I.102505.A, syntype; F: NHMUK 1888.12.4.522, Theobald collection).

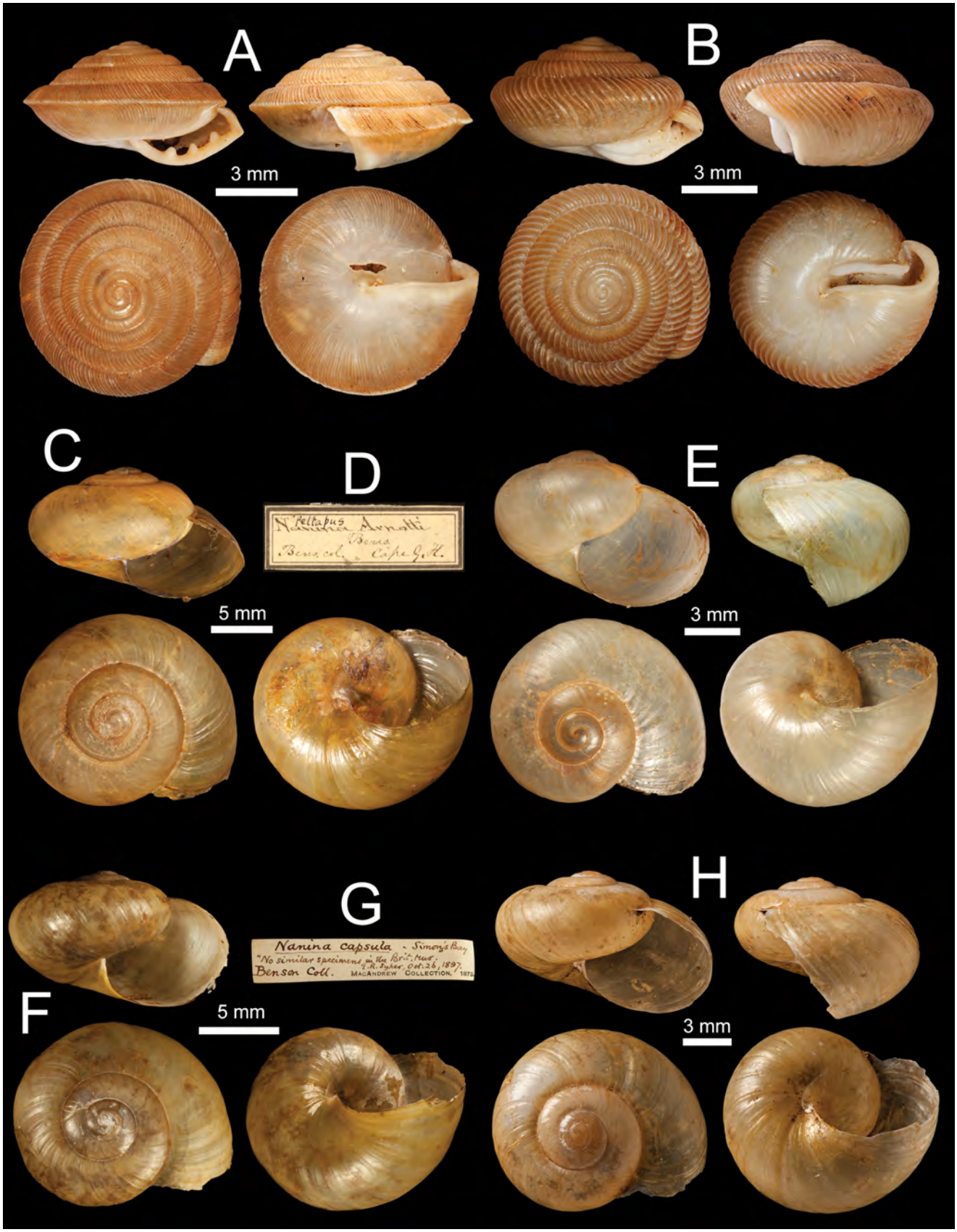


FIGURE 93. **A.** *Helix capessens* Benson, 1856 (UMZC I.103040.A, syntype). **B.** *Helix pylaica* Benson, 1856 (UMZC I.102940.A, Benson collection). **C–D.** *Helix arnotti* Benson, 1864 (C: UMZC I.103155.A, syntype; D: label that accompanies C). **E.** *Helix hudsoniae* Benson, 1864 (UMZC I.103370.A, syntype). **F–H.** *Helix capsula* Benson, 1864 (F: UMZC I.104335.A, syntype; G: label that accompanies F; H: NHMUK 1954.6.2.117, J.S. Hawkins collection).

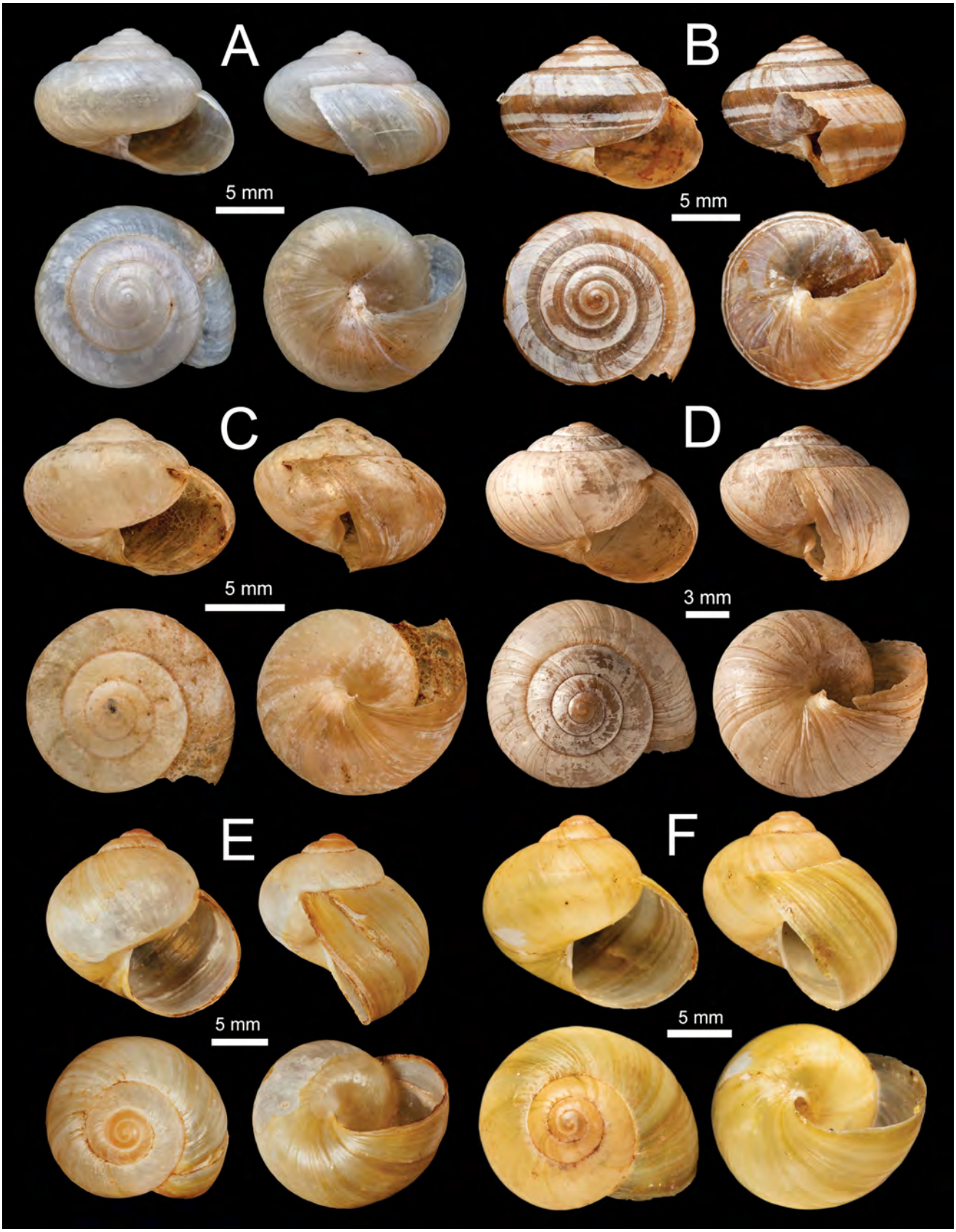


FIGURE 94. **A–B.** *Helix cotyledonis* Benson, 1850 (A: UMZC I.103590.A, syntype; B: NHMUK 1859.10.12.22/1, syntype). **C–D.** *Helix phytostylus* Benson, 1864 (C: UMZC I.103125.A, neotype; D: NHMUK 1912.8.16.277, E.L. Layard collection). **E–F.** *Helix trotteriana* Benson, 1848 (E: UMZC I.102395.A, syntype; F: NHMUK 20190443, syntype).

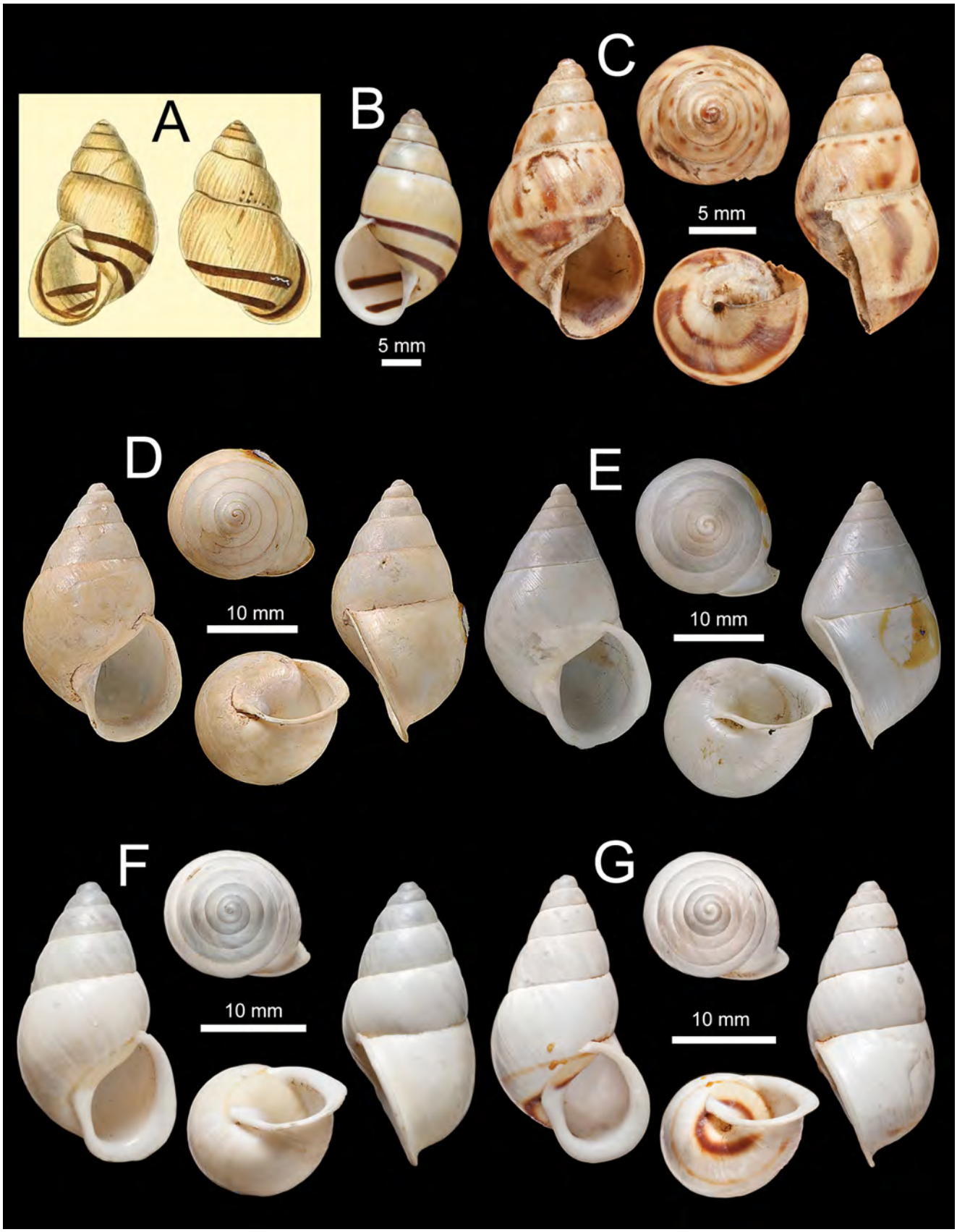


FIGURE 95. A–B. *Bulimus sinensis* Benson, 1851 (A: illustration of holotype from Pfeiffer, 1853 [in 1840–1865], Pl. 20, figs 1–2; B: UMZC I.104925.A, Benson collection). **C.** *Bulimus theobaldianus* Benson, 1857 (NHMUK 1907.11.21.64, Hanley collection). **D–E.** *Bulimus physalis* Benson, 1857 (C: UMZC I.102805.A, lectotype; D: UMZC I.102805.B, paralectotype). **F–G.** *Bulimus fuscoventris* Benson, 1856 (E: UMZC I.103010.A, syntype; F: UMZC I.103010.B, syntype).

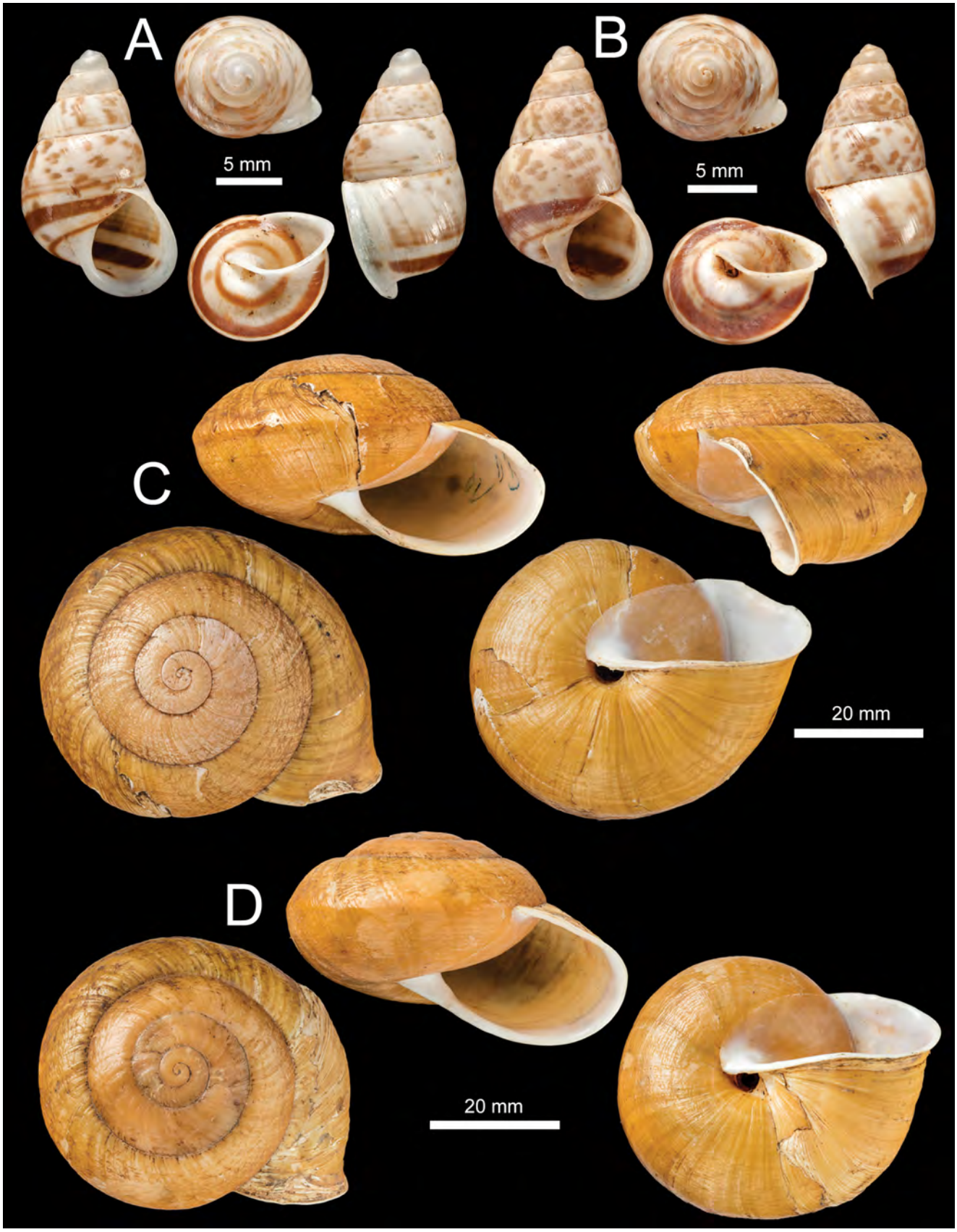


FIGURE 96. **A–B.** *Bulimus rufopictus* Benson, 1856 (A: UMZC I.103060.A, syntype; B: UMZC I.103060.B, syntype). **C–D.** *Helix ochthoplax* Benson, 1860 (C: NHMUK 1888.12.4.2003, holotype; D: NHMUK 1906.1.1.720, W.T. Blanford collection).

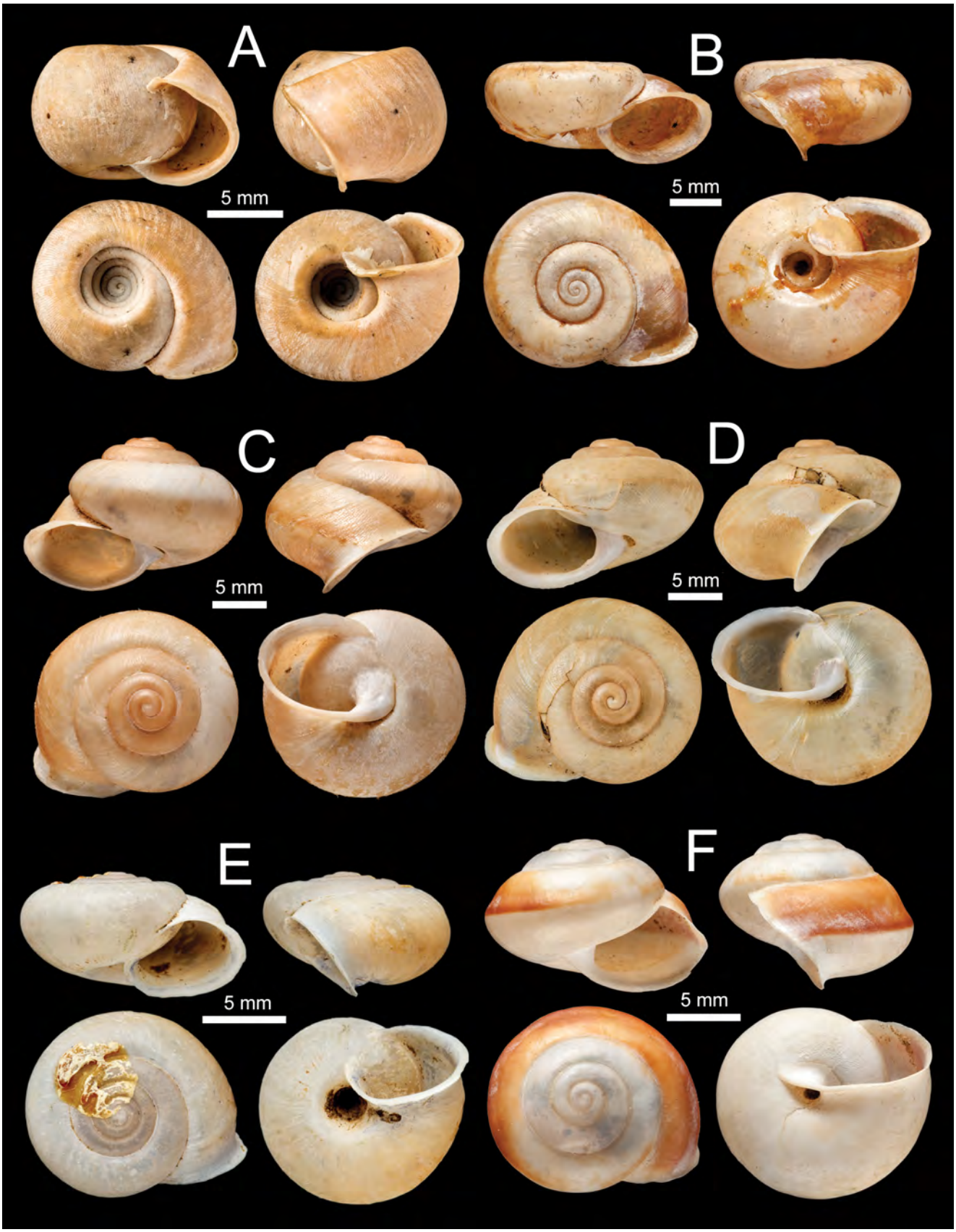


FIGURE 97. **A.** *Helix bifoveata* Benson, 1856 (NHMUK 1888.12.4.1454, neotype). **B.** *Helix delibrata* Benson, 1836 (UMZC I.102050, syntype). **C–D.** *Helix cyclotrema* Benson, 1863 (C: UMZC I.104320, syntype; D: NHMUK 1888.12.4.572, Theobald collection). **E.** *Helix helferi* Benson, 1860 (UMZC I.103405, holotype). **F.** *Helix hemiopta* Benson, 1863 (UMZC I.103120.A, syntype).

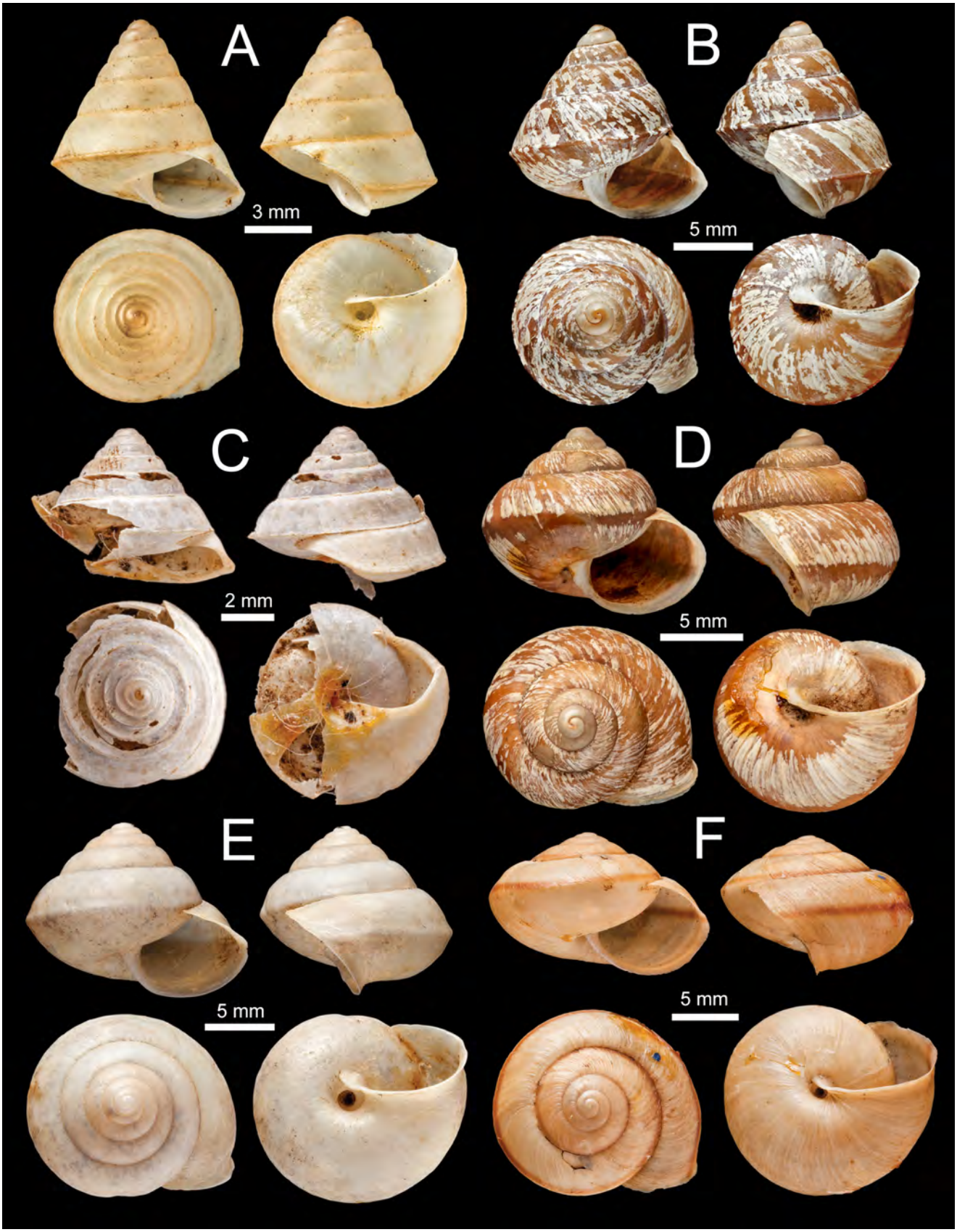


FIGURE 98. **A.** *Helix acris* Benson, 1859 (NHMUK 1888.12.4.623, holotype). **B.** *Helix capitium* Benson, 1848 (UMZC I.102385/2, paralectotype). **C.** *Helix galea* Benson, 1859 (NHMUK 1888.12.4.511, holotype). **D.** *Helix hariola* Benson, 1856 (UMZC I.104370/2, paralectotype). **E.** *Helix scenoma* Benson, 1863 (UMZC I.103180, holotype). **F.** *Helix scenoma* var. *depressa* Benson, 1863 (UMZC I.103185, syntype).

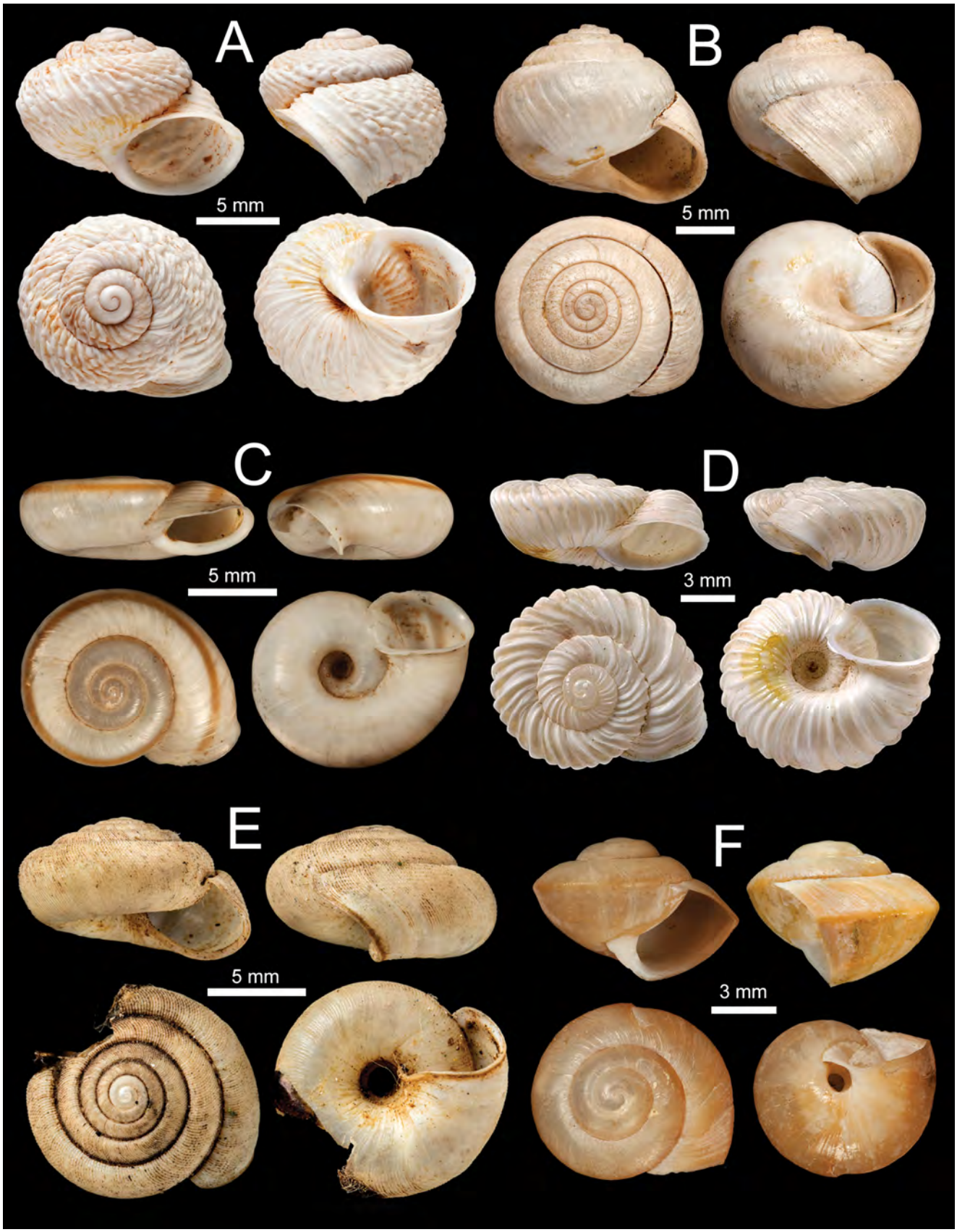


FIGURE 99. **A.** *Helix plectilis* Benson, 1853 (UMZC I.103790.A, syntype). **B.** *Helix tescorum* Benson, 1853 (UMZC I.103785, holotype). **C.** *Helix contracta* Benson, 1864 (UMZC I.102310.A, syntype). **D.** *Helix crassicostata* Benson, 1848 (UMZC I.102380.A, lectotype). **E.** *Helix fritillata* Benson, 1863 (NHMUK 1888.12.4.1085, neotype). **F.** *Helix trochalia* Benson, 1861 (UMZC I.103340, syntype).

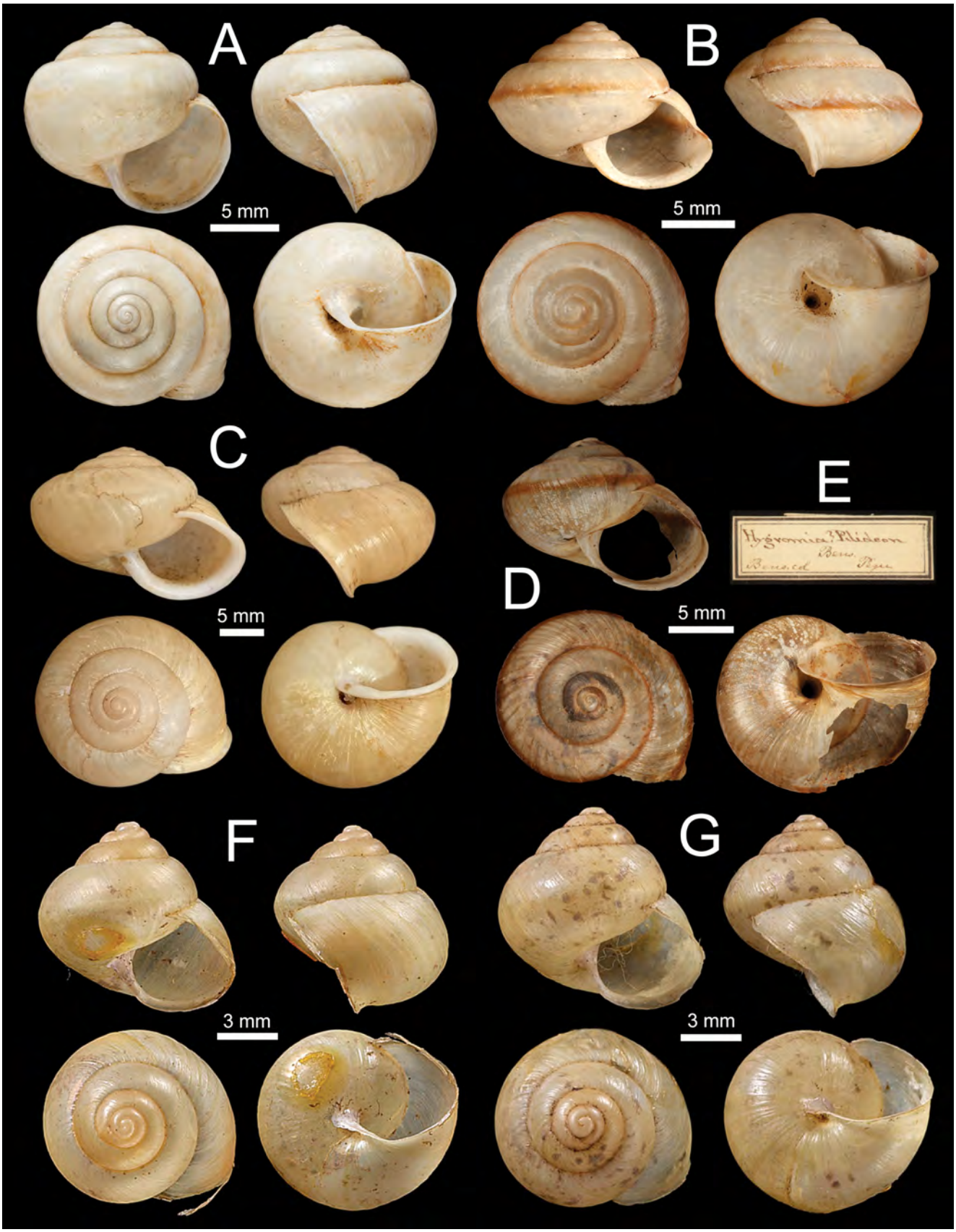


FIGURE 100. **A.** *Helix bolus* Benson, 1856 (UMZC I.102975.A, syntype). **B.** *Helix cestus* Benson, 1836 (NZSI M.18987/3, syntype). **C.** *Helix peguensis* Benson, 1860 (NHMUK 1906.2.2.296, neotype). **D–E.** *Helix pilidion* Benson, 1860 (D: UMZC I.103095, syntype; E. McAndrew label associated with D). **F–G.** *Helix radicicola* Benson, 1848 (E: UMZC I.102390.A, syntype; F: UMZC I. 102390.B, syntype).

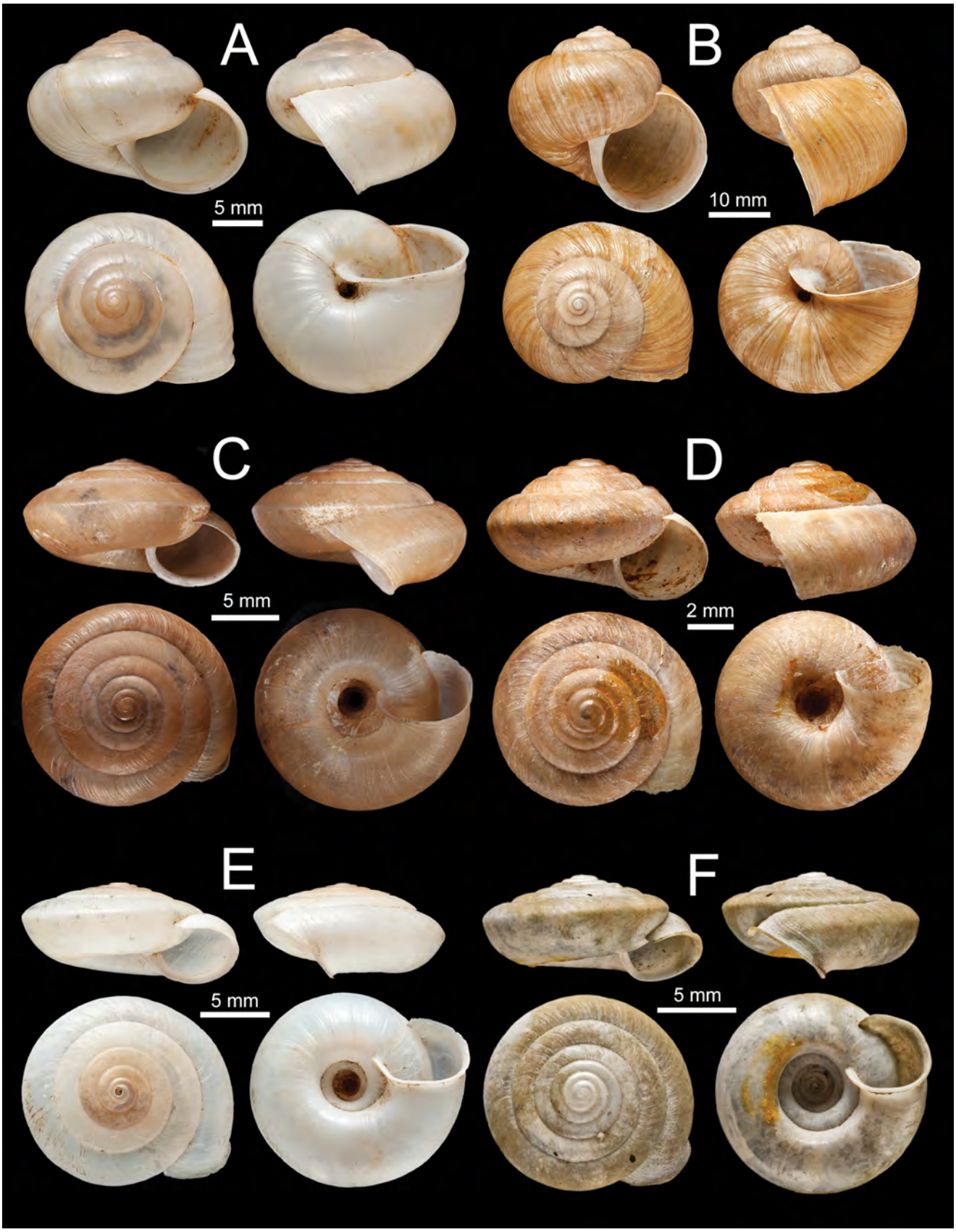


FIGURE 101. **A.** *Helix scalpturita* Benson, 1859 (UMZC I.104920.A, syntype). **B.** *Helix ravida* Benson, 1842 (UMZC I.104700.A, syntype). **C.** *Helix tapeina* Benson, 1836 (UMZC I.102035.A, Benson collection). **D.** *Helix orbicula* Benson, 1838 (UMZC I.102085.A, syntype). **E–F.** *Helix oldhami* Benson, 1859 (E: UMZC I.104645.A, lectotype; F: UMZC I.104645.B, paralectotype [identified as *Plectotropis tapeina* var. *akowtongensis* by Gude, 1914]).

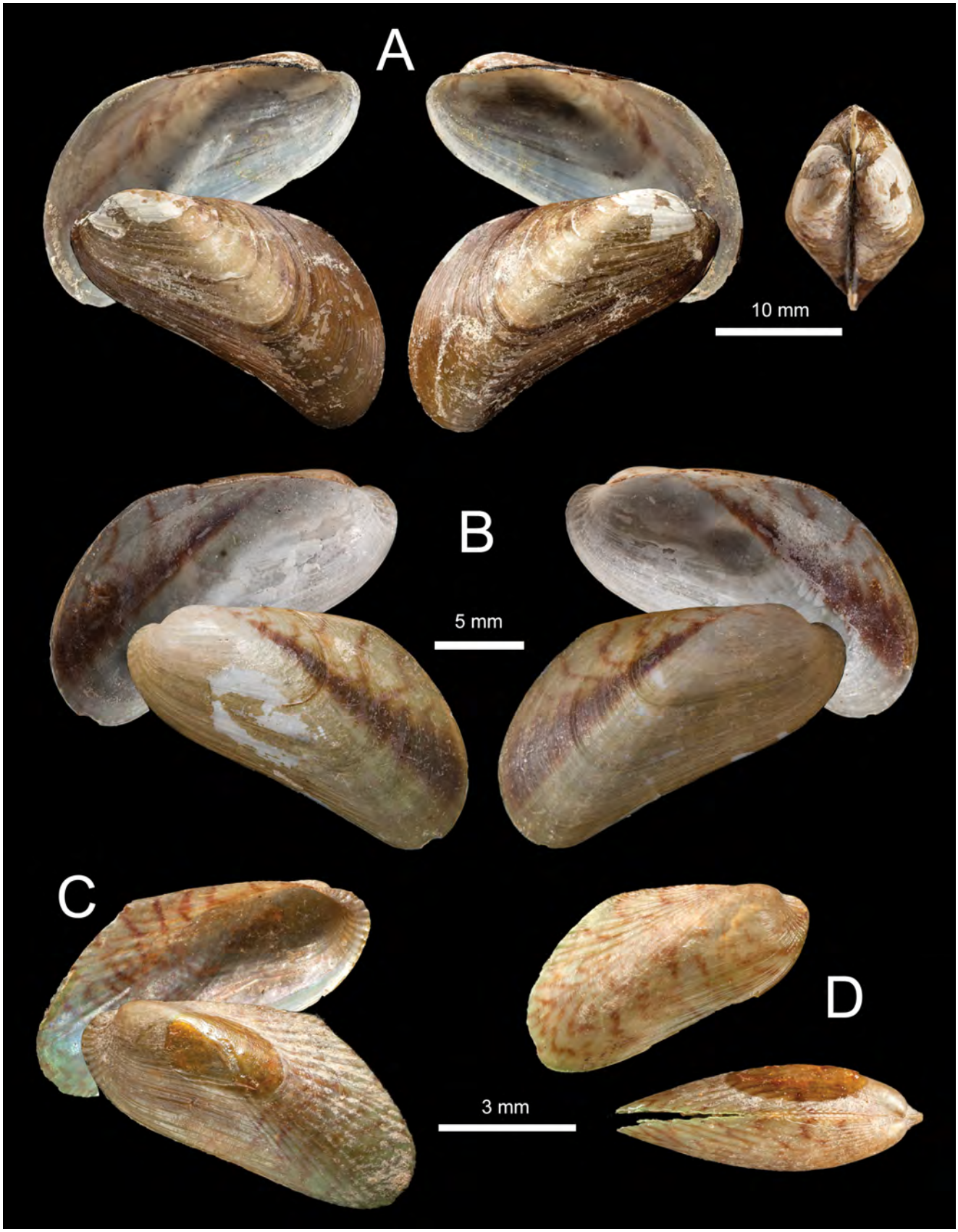


FIGURE 102. **A–B.** *Modiola senhousia* Benson, 1842 (A: OUMNH.ZC.MO25568, syntype; B: NHMUK 1985011/1, Cuming collection). **C–D.** *Modiola variegata* Benson, 1855 (B: UMZC I.105060.A, syntype; C: UMZC I.105060.B, syntype).

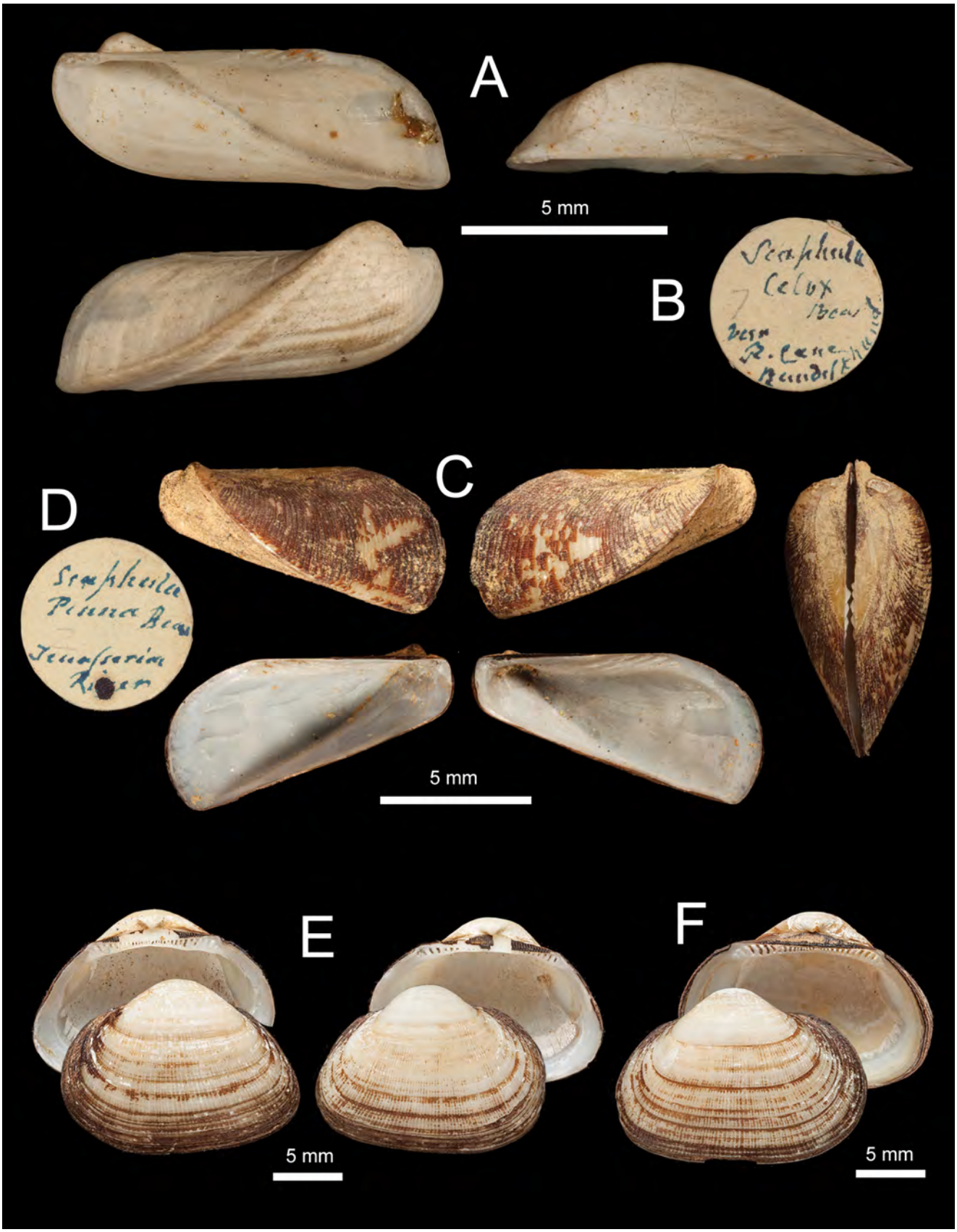


FIGURE 103. A–B. *Scaphula celox* Benson, 1836 (A: UMZC I.102245, syntype; B: label that accompanies A). **C–D.** *Scaphula pinna* Benson, 1856 (C: UMZC I.102955.A, syntype; D: label that accompanies C). **E–F.** *Arca galactodes* Benson, 1842 (E: UMZC I.105200.A, syntype; F: UMZC I.105200.B, syntype).

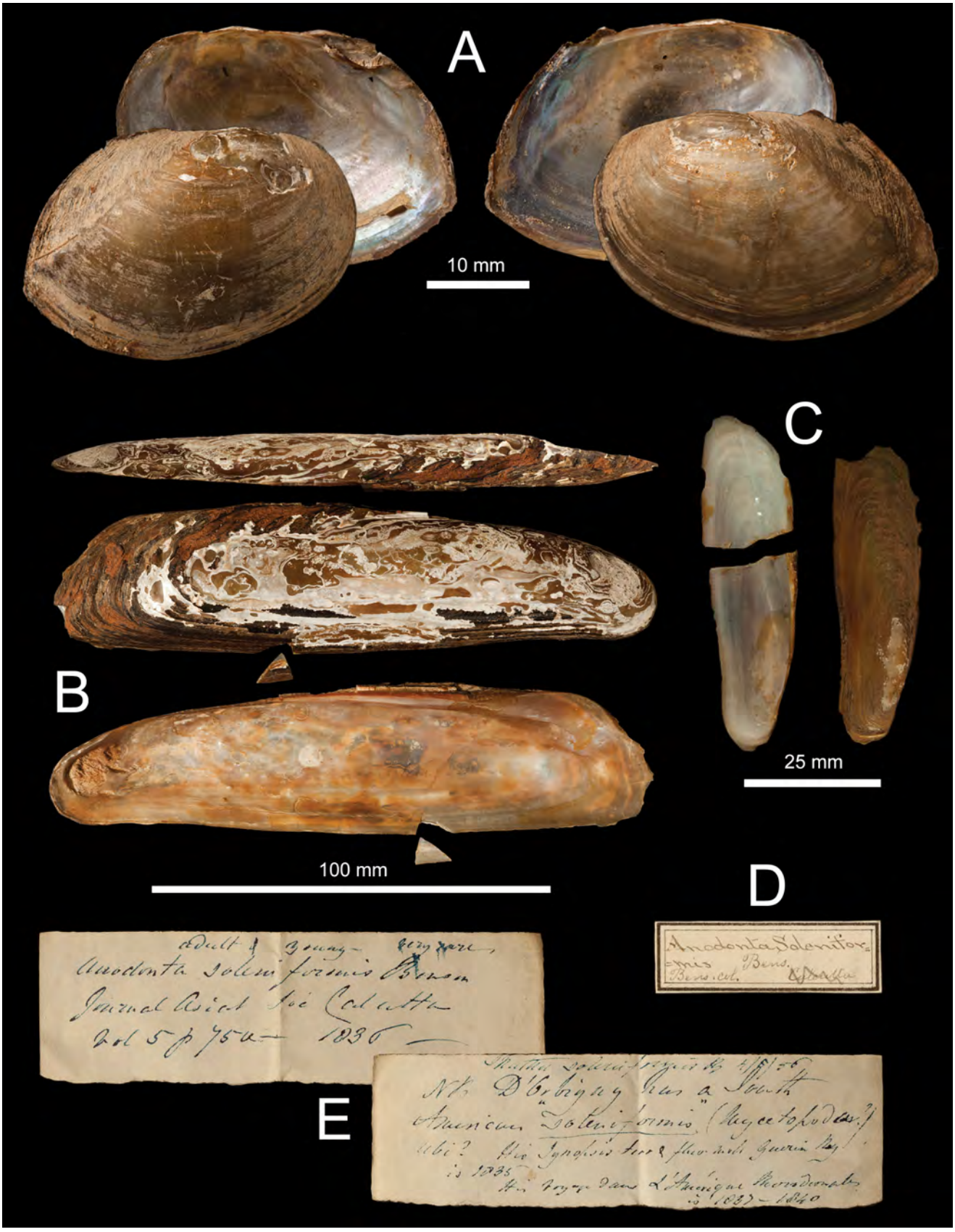


FIGURE 104. **A.** *Anodon gibbum* Benson, 1842 (NHMUK 1842.9.30.45-46, syntype). **B–E.** *Anodonta soleniformis* Benson, 1836 (B: UMZC I.102275.A, syntype; C: UMZC I.102275.B, juvenile syntype; D: label written by McAndrew; E: label written by Benson).

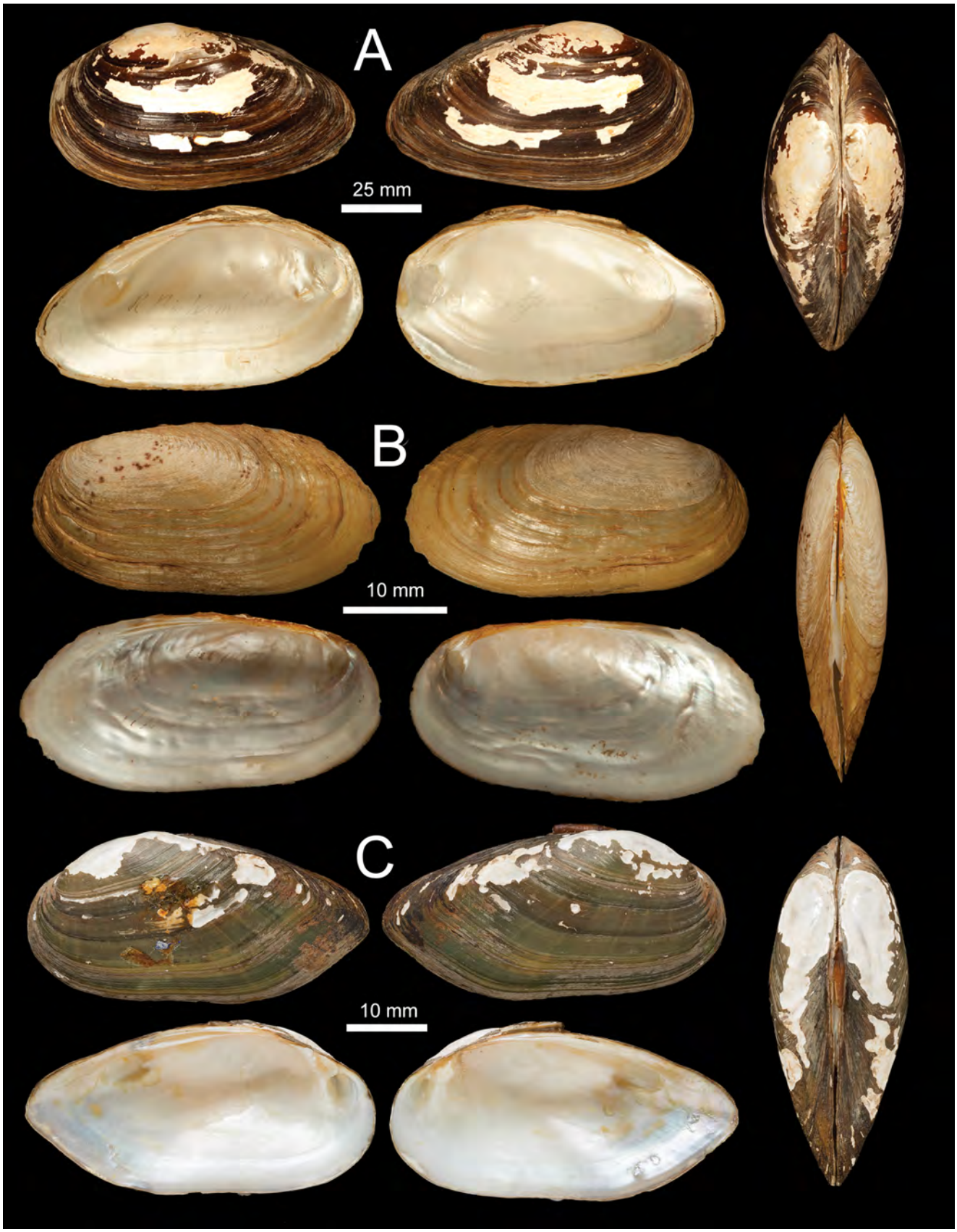


FIGURE 105. **A.** *Unio jenkinsianus* Benson, 1862 (UMZC I.103130, syntype). **B.** *Unio theca* Benson, 1862 (UMZC I.103220, holotype). **C.** *Unio pugio* Benson, 1862 (UMZC I.105040.A, Benson collection).

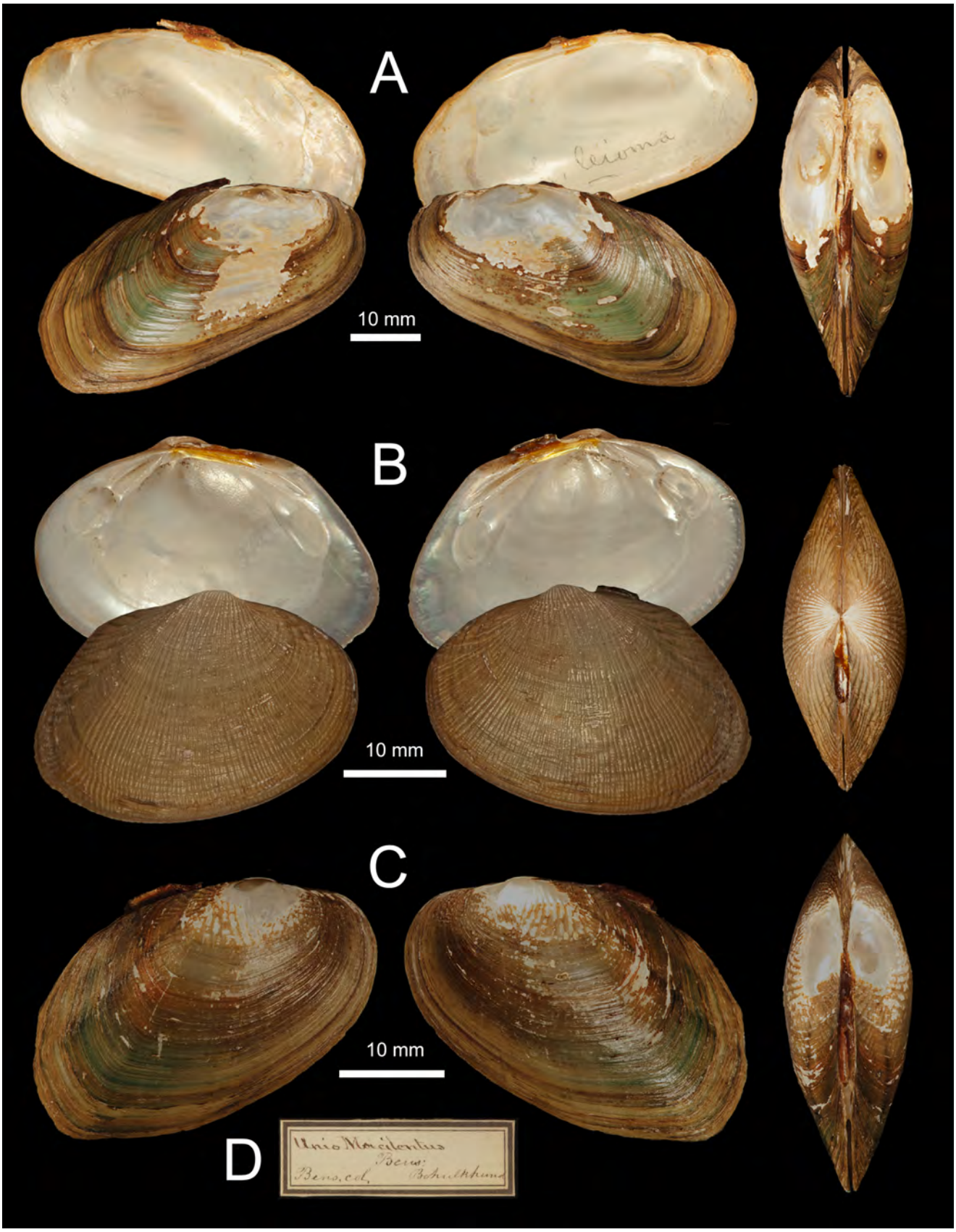


FIGURE 106. **A.** *Unio leioma* Benson, 1862 (UMZC I.103345, syntype). **B.** *Unio crispisulcatus* Benson, 1862 (UMZC I.103215.A, syntype). **C.** *Unio macilentus* Benson, 1862 (UMZC I.103385, syntype).

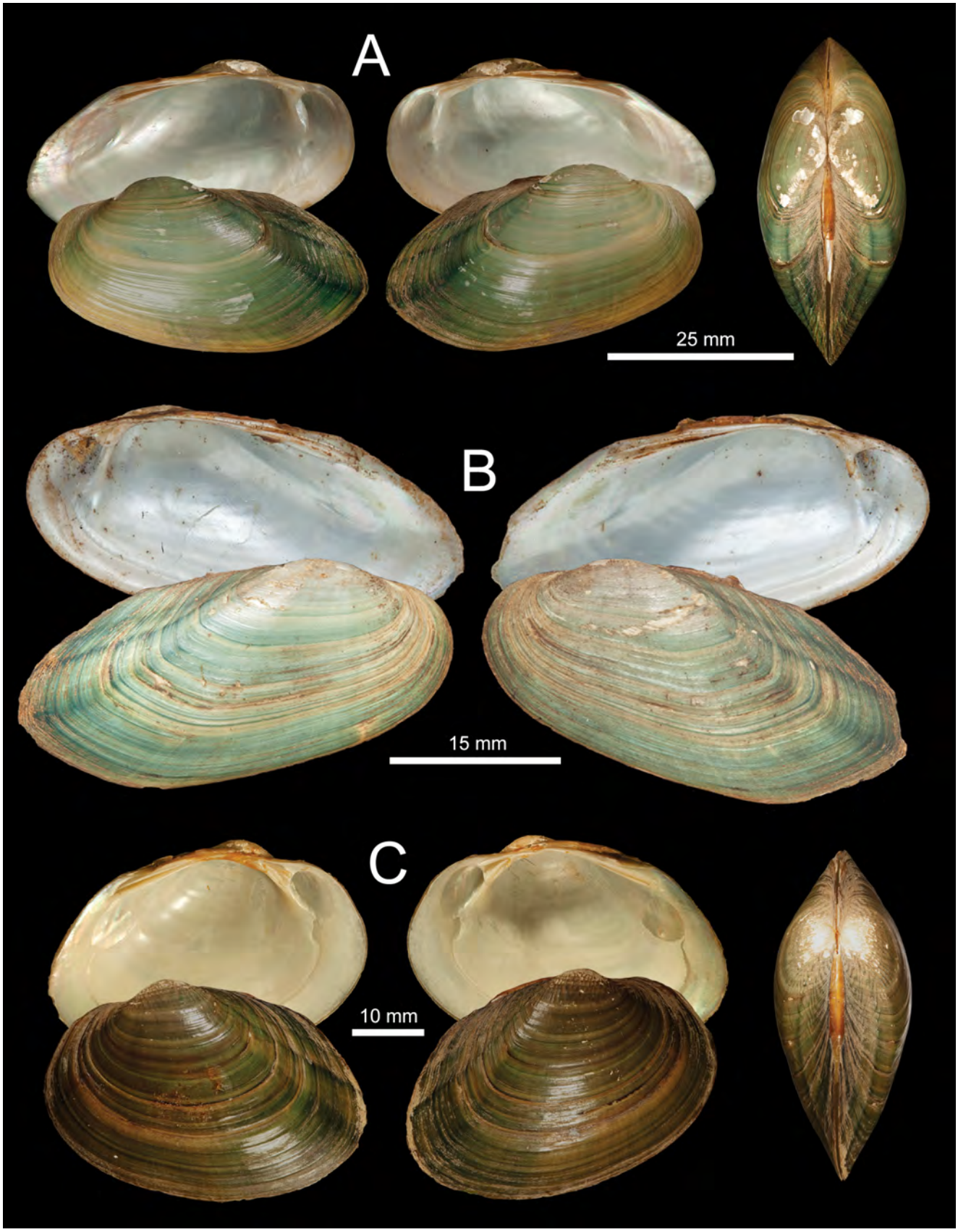


FIGURE 107. **A–B.** *Unio pachysoma* Benson, 1862 (A: UMZC I.103205.A, syntype; B: NHMUK 20150103, syntype). **C.** *Unio laevirostris* Benson, 1862 (UMZC I.103235.A, syntype).

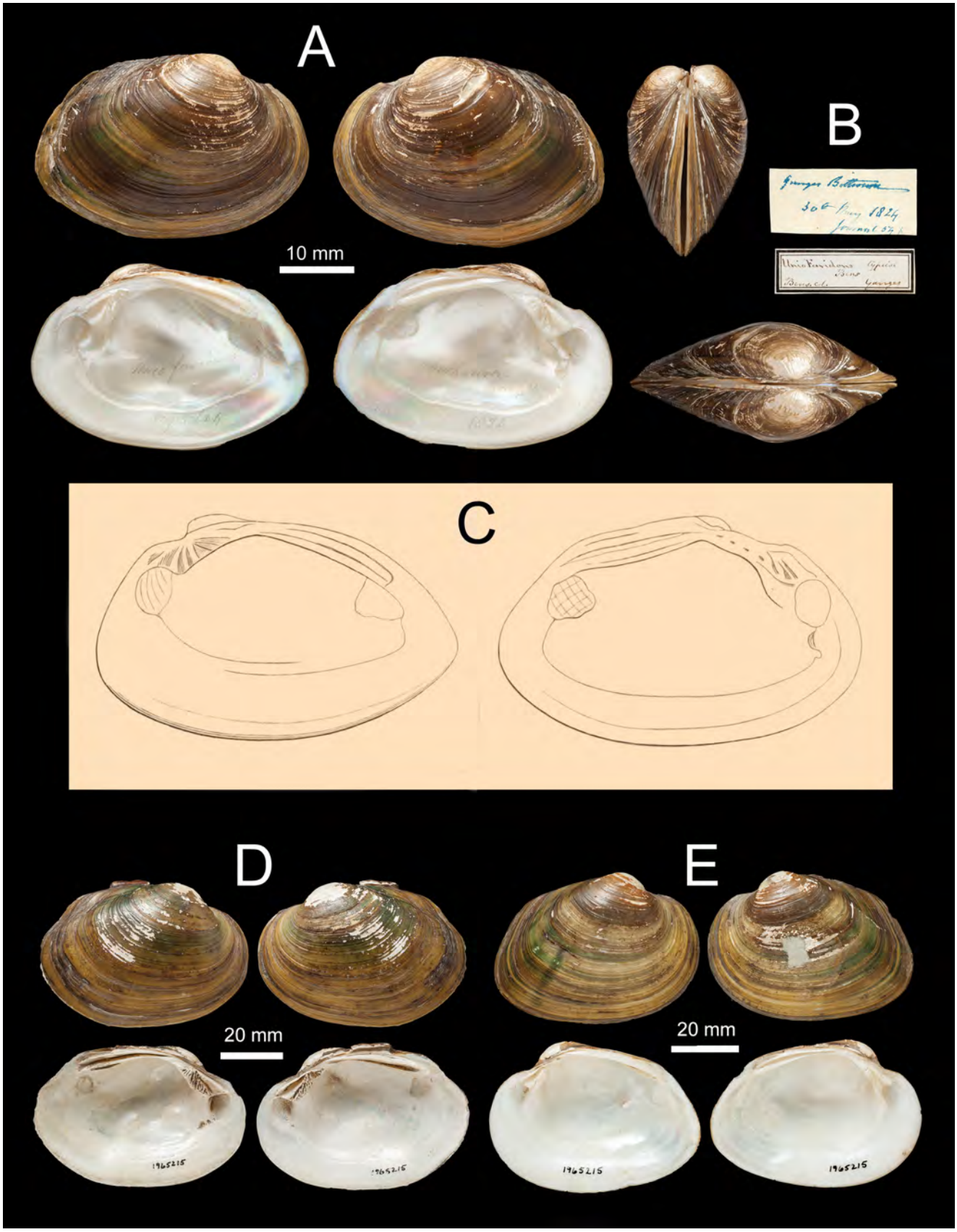


FIGURE 108. A–E. *Unio favidens* Benson, 1862 (A: UMZC. I.103450, holotype; B: original labels that accompany A; C: illustration of the holotype from Benson, 1829, Pl. VII, Fig. 1; D–E NHMUK 1965215/1 and NHMUK 1965215/2, Cuming collection).

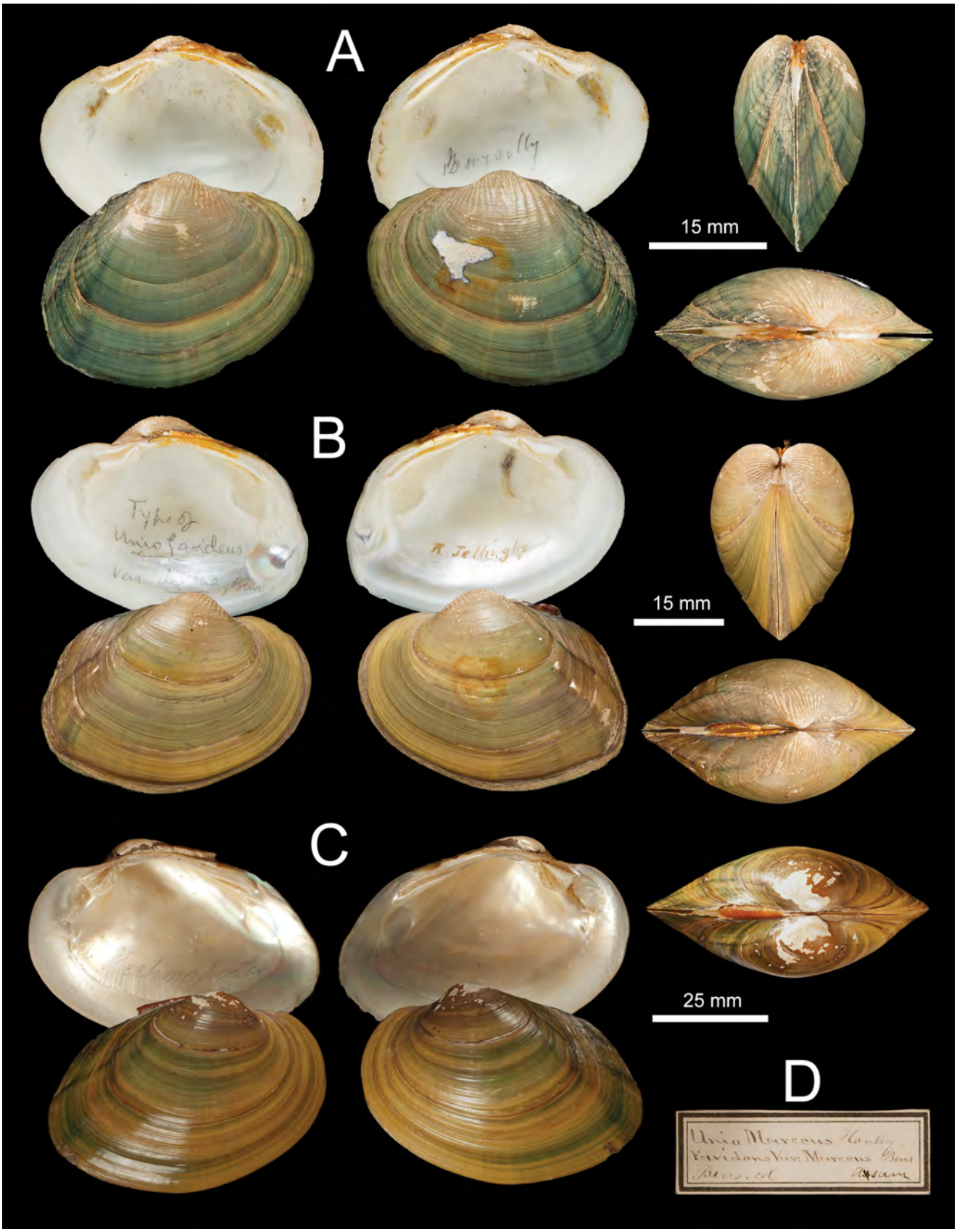


FIGURE 109. **A.** *Unio favidens* var. *chrysis* Benson, 1862 (UMZC I.105235, McAndrew collection). **B.** *Unio favidens* var. *deltae* Benson, 1862 (UMZC I.105025.A, holotype). **C–D.** *Unio favidens* var. *marcens* Benson, 1862 (C: UMZC I.103165.A, syntype; D. label that accompanies A).

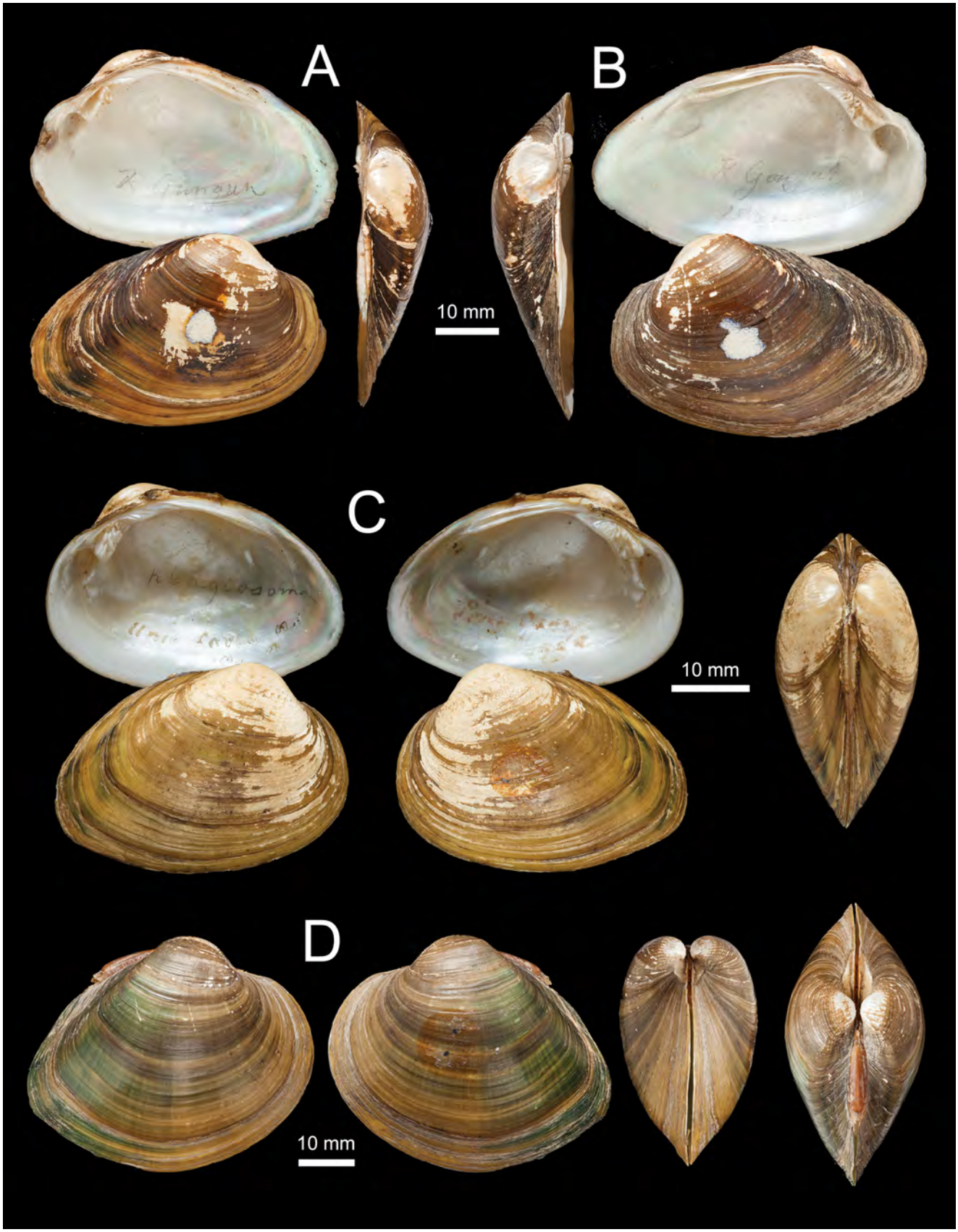


FIGURE 110. A–B. *Unio pinax* Benson, 1862 (A: UMZC I.105035.A, syntype; B: UMZC I.105035.B, syntype). **C.** *Unio plagiosoma* Benson, 1862 (UMZC I.103380, syntype). **D.** *Unio favidens* var. *trigona* Benson, 1862 (UMZC I.103475.A, syntype).

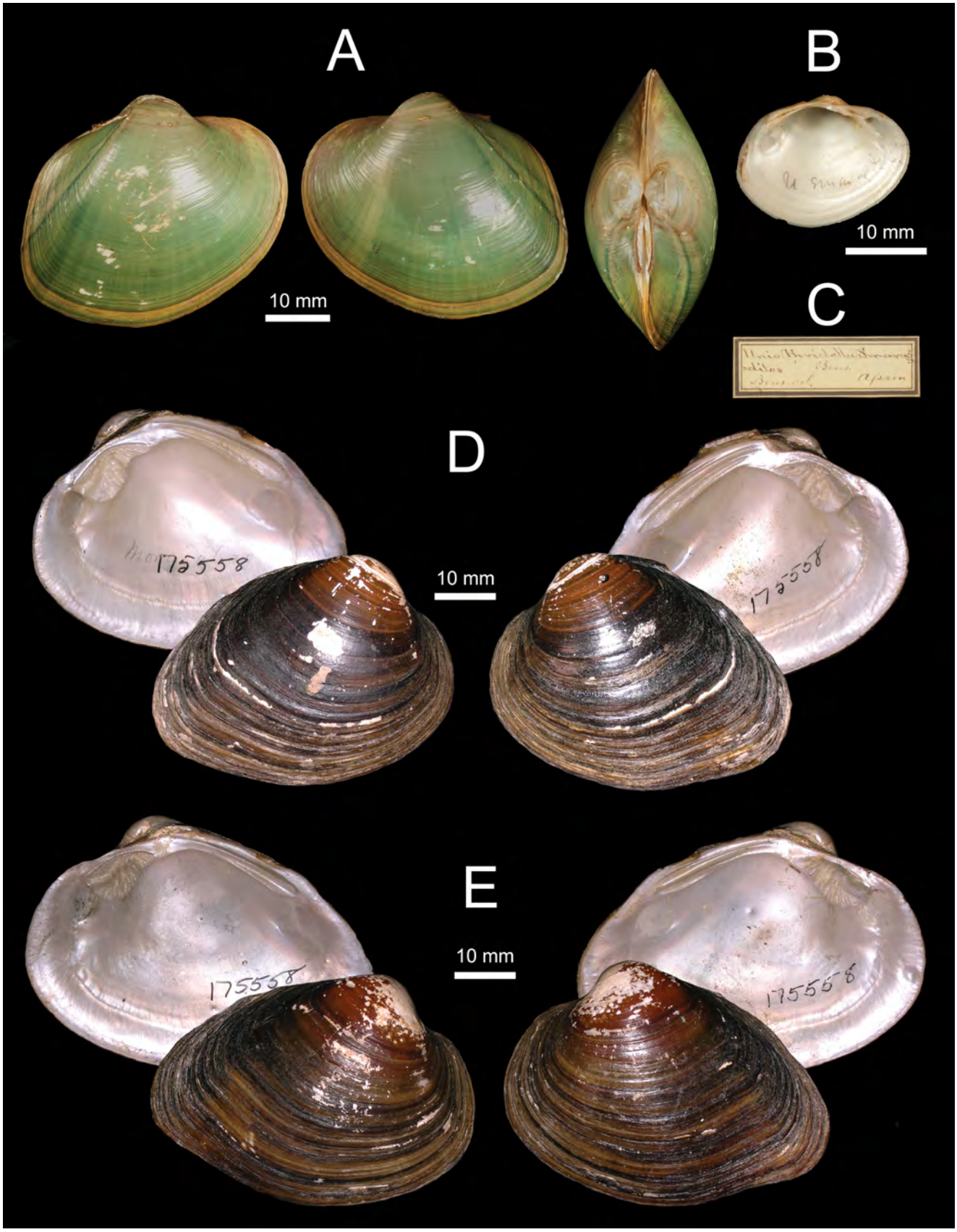


FIGURE 111. A–C. *Unio smaragdites* Benson, 1862 (A: UMZC I.103360.A, syntype; B: UMZC I.103360.B, syntype; C: label that accompanies A and B). **D–E.** *Unio triembolus* Benson, 1862 (D: MCZH 175558 specimen 1, syntype; E: MCZH 175558 specimen 2, ©President and Fellows of Harvard College).

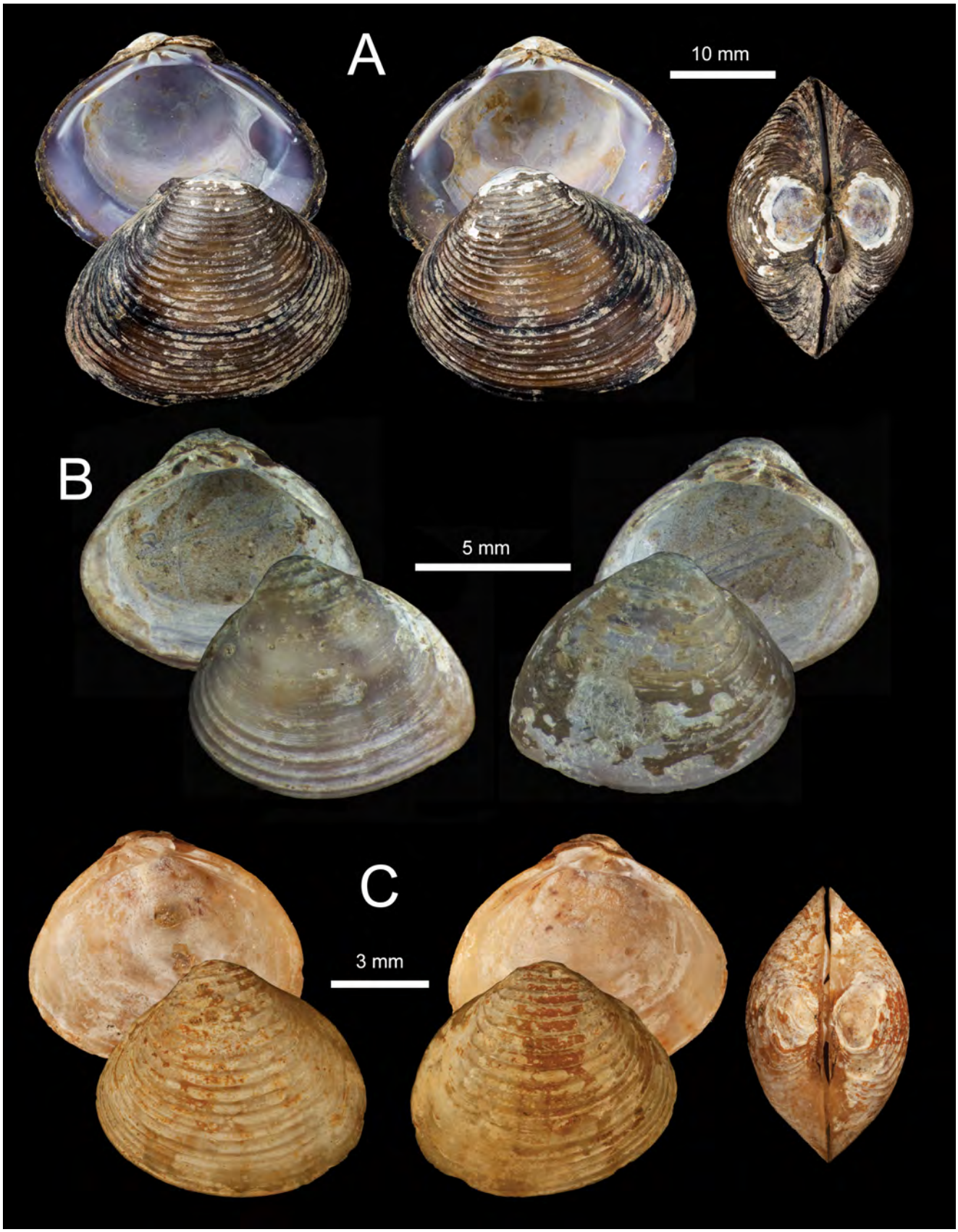


FIGURE 112. **A.** *Corbicula fuscata* Benson, 1842 (OUMNH.ZC.MO25565, syntype). **B–C.** *Corbicula quilonica* Benson, 1860 (B: MCZH 187460, lectotype, ©President and Fellows of Harvard College; C: UMZC I.103195.A, paralectotype).

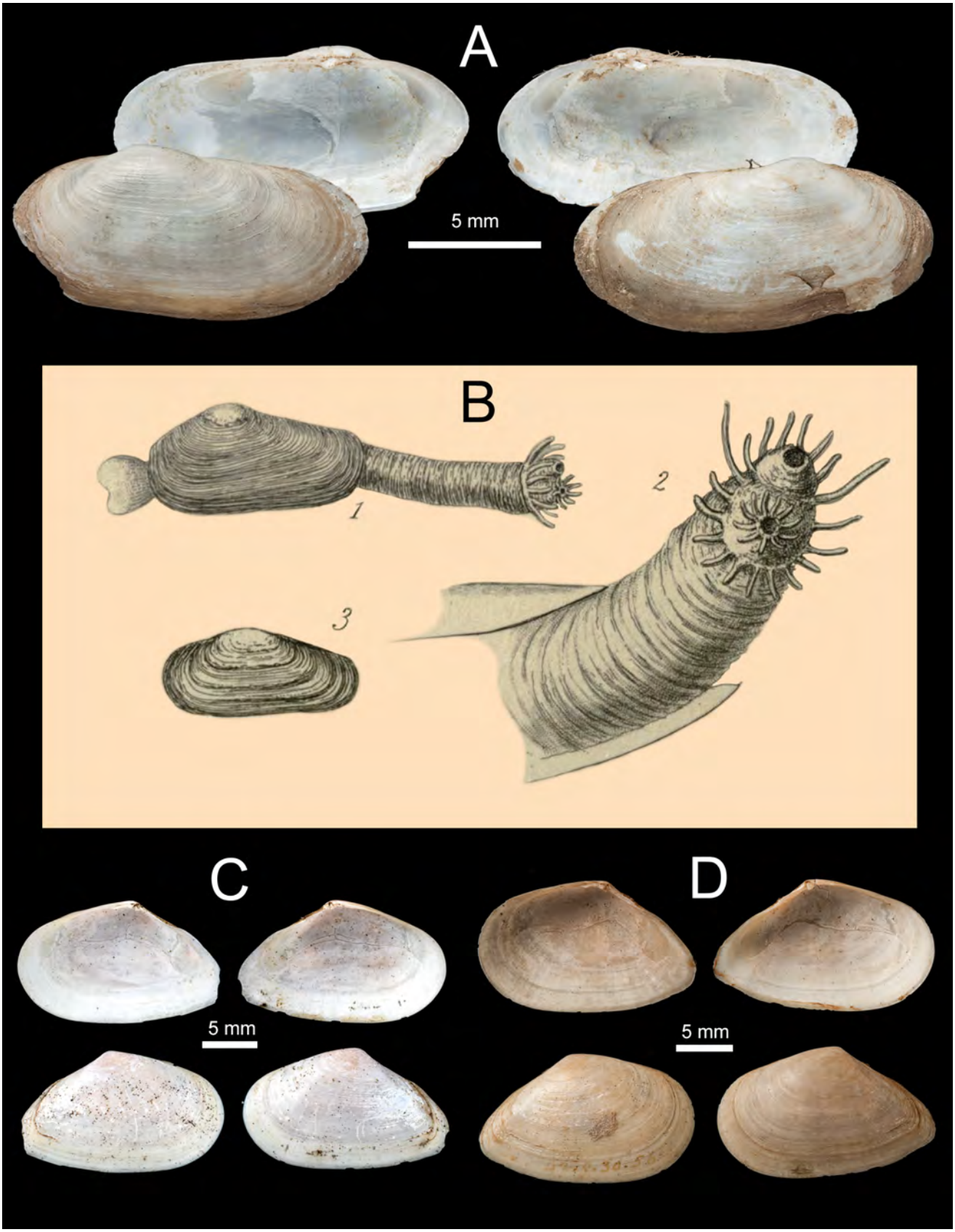


FIGURE 113. A–B. *Tanysiphon rivalis* Benson, 1858 (A: NHMUK 1858.7.23.33, syntype; B: illustrations from Benson, 1858b, Plate XII B, Figs 1-3). **C–D.** *Sanguinolaria iridescens* Benson, 1842 (C: OUMNH.ZC.MO25567, syntype; D: NHMUK 1858.7.23.33, syntype).

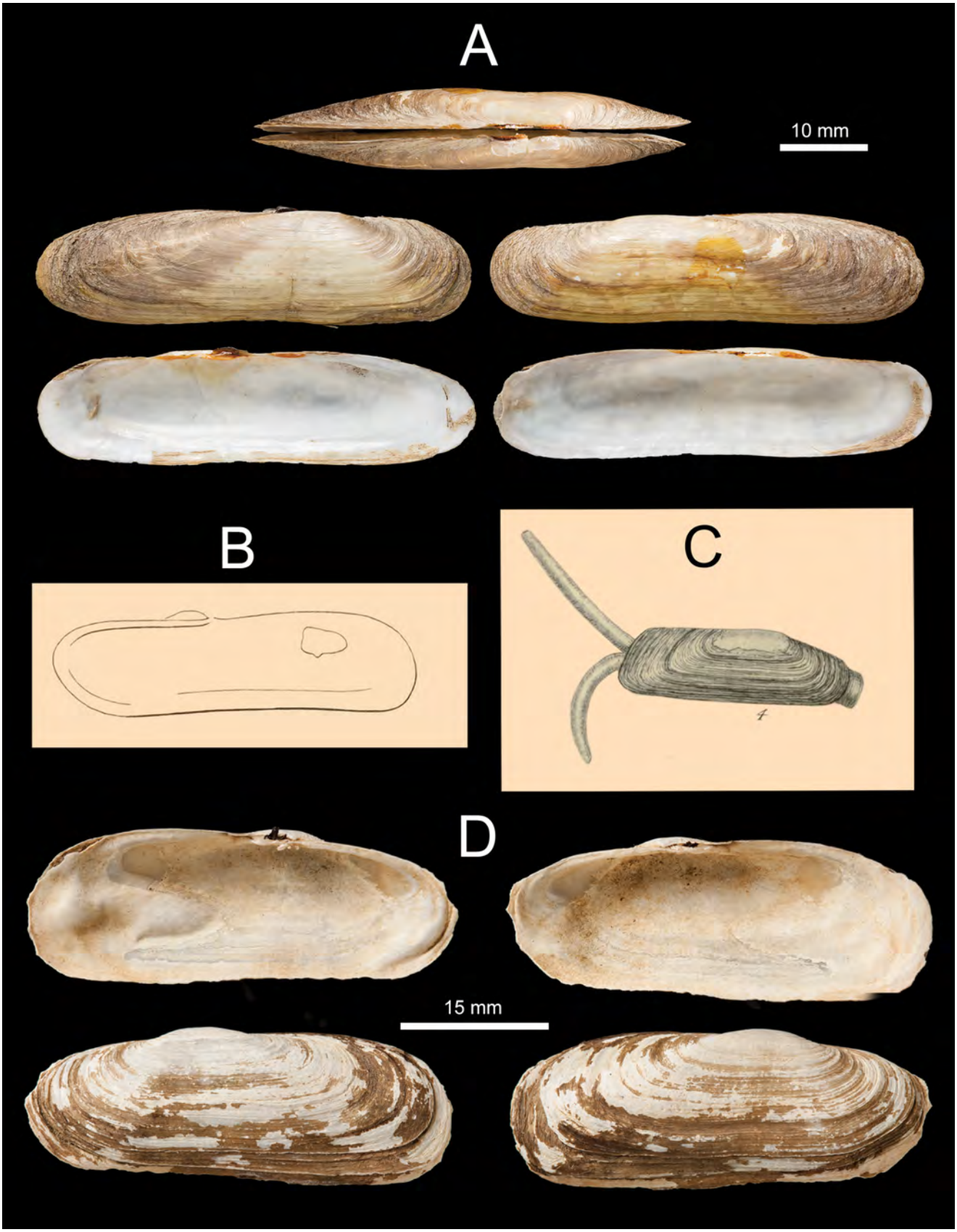


FIGURE 114. A–D. *Novaculina gangetica* Benson, 1830 (A: UMZC I.102125.A, lectotype; B: illustration from Benson, 1829d, Pl. VII, Fig. 4; C: illustration from Benson, 1858b, Pl. XII B, Fig. 4; D: NHMUK 1954.6.2.1287, syntype).

DISCUSSION

Despite his demanding duties working as a civil servant for the East India Company and, in later life, suffering from poor health, William Benson was able to pursue a passionate interest in natural history and garnered a reputation as the leading authority on Indian molluscs. He wrote more than 100 articles between his first one, published in 1829, and his last in 1865, five years before his death (Appendix 1). Apart from four entomological papers (Benson, 1829a; 1846, 1847, 1861a), all of his scientific work was concerned with molluscs, especially non-marine species, principally from the region of Asia then called British India. Most of these publications were taxonomic, essentially describing the fauna from the Indian subcontinent for the first time. He maintained an impressive output throughout most of his life, but this increased markedly after his retirement when he published something every year, except when ill-health prevented this in his final few years (**Fig. 115**). Looking at the subject matter of his publications, the rather general interest in molluscs early in his career later became focused almost exclusively on terrestrial species. Land snails account for about 80% of the species that he described, which explains the much higher proportion of gastropods (93%) that he named compared with bivalves (7%).

Benson introduced new names for 471 taxa, belonging to 60 families of gastropod and 8 families of bivalve. This total includes 14 named varieties (eight within the gastropods: *Cyclophorus convexiusculus* var. *minor*, *Alycaeus constrictus* var. *minor*, *Viviparus bengalensis* var. *balteata*, *Spiraxis haughtoni* var. *oxynter*, *Helix* (*Plectopylis*) *refuga* var. *dextrorsa*, *Pupa layardi* var. *minor*, *Helix climacterica* var. *nana*, *Helix scenoma* var. *depressa*; and six within the bivalves, all varieties of *Unio favidens*: *marcens*, *trigona*, *deltae*, *chrysis*, *viridula* and *densa*). This impressive total is augmented by the material from his collection that was used by others to erect many more taxa. Exclusively marine taxa, consisting of at least 10 species of (mostly pelagic) gastropod, represent only 2% of the species that he described, although some of his bivalve taxa were marine. The vast majority of the remaining gastropod taxa described by Benson were pulmonates (287 taxa, 61%), but there were substantial numbers of caenogastropods (134 taxa, 28%), reflecting their relatively higher frequencies in faunas from tropical ecosystems compared with those from temperate regions, a few neritimorphs (12 taxa, 3%) and four non-pulmonate heterobranchs (1%).

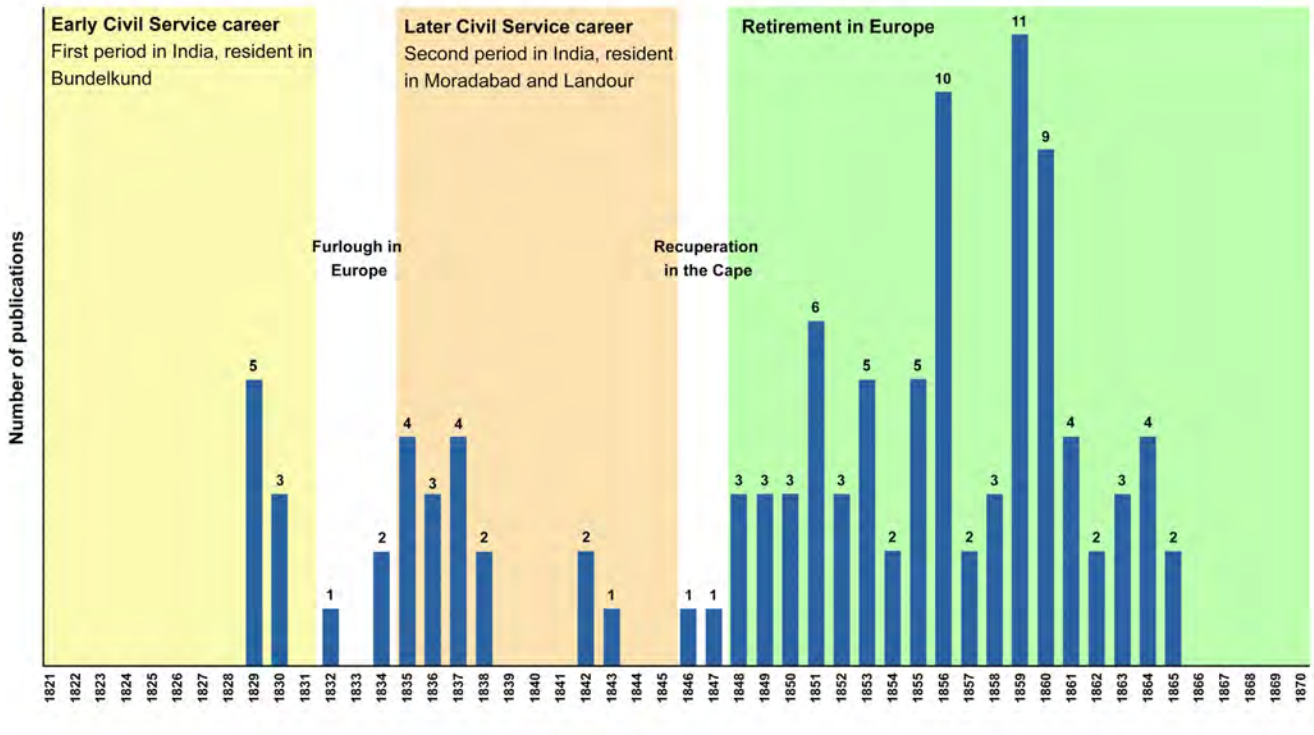


FIGURE 115. William Benson's professional and scientific career, spanning the period between his arrival in India in 1821 and his death in 1870, showing his primary place of residence and the number of papers he published each year.

Most of these species were terrestrial, although quite a number were aquatic, representing a range of freshwater habitats, and a few inhabiting brackish water. He also described 34 bivalve taxa (7%), including the six named varieties of *Unio favidens* listed above. Benson also introduced names for 32 genus-groups belonging to 15 families of gastropod and 3 families of bivalve, although some of these have been synonymised. Moreover, some 102 taxa described by Benson have been designated as the type species of genera or subgenera described either by himself or others (Table 4), although only 70 of these are currently accepted.

Not all of the 471 taxa introduced by Benson are now considered valid species. He introduced one name (*Helix cyclaspis*) as a replacement for *Helix catinus* Benson, 1859, which was preoccupied by *Helix catinus* L. Pfeiffer, 1857. Benson also published names for nine taxa (*Cyclostoma involvulus, Stenothyra frustillum*, *Pupa gutta*, *Spiraxis cingalensis*, *Helix seposita*, *Vitrina edgariana*, *Achatina facula*, *Achatina pachycheila* and *Mytilus niger*) that we consider to be *nomina dubia* pending further research. No authentic specimens can be traced for any of these species and the original descriptions are insufficient to resolve their identity or allow differential diagnoses. Benson also introduced, or has been associated with, the names for about 20 other taxa but these were not accompanied with any description or figure and are therefore *nomina nuda*.

There has been substantial revision of Benson's taxa, which is still ongoing. One of the species that Benson described as a variety (*Helix* (*Plectopylis*) *refuga* var. *dextrorsa*) has subsequently been elevated to species rank but several taxa that Benson thought were good species are now regarded as varieties or subspecies of other taxa. This applies to the following four gastropod taxa: *Lymnaea chlamys*, *Planorbis cantori*, *Helix paludicola*, and *Bulimus rufopictus*. The situation with the bivalves is more complicated. Three bivalve taxa (*Unio laevirostris*, *U. pinax* and *U. plagiosoma*), originally considered distinct, were until recently regarded as further varieties of *Unio favidens* in addition those named as such. However, *U. favidens* has itself now been synonymised with *Parreysia corrugata* (O.F. Müller, 1774), bringing six of Benson's taxa into the synonymy of this species but not *Unio plagiosoma* (Bolotov et al., 2022).

Some 75 taxa (16%) introduced by Benson have been considered junior synonyms of other species by various authors. This figure might be expected to rise when detailed systematic revisions are eventually undertaken. This figure might be expected to rise when detailed systematic revisions are eventually undertaken. However, molecular systematics frequently reveals the existence of cryptic species, which it may or may not be possible to associate with established type material. *Sinanodonta woodiana*, for example, has recently been shown to be a species complex and some names previously regarded as synonyms, such as *Anodon gibbum* Benson, have been resurrected as names for some of the newly recognized species (Kondakov et al., 2018: 513). We have discovered several additional synonyms during this project, such as the synonymy of *Helix tescorum* and *Rhagada torulus*. On more than one occasion Benson introduced multiple names for taxa that he himself had originally named. This is not just down to carelessness but reflected partly the difficulty in seeing all the relevant literature and reference material and partly in the belief of the day that variation in size or coloration must reflect specific differences rather than intraspecific polymorphism. Occasionally juvenile specimens of one species were mistaken for adults of another. For example, in the absence of a growth series Benson (1856e) described *Otopoma blennus* believing it to be generically distinct from *Megalomastoma gravidum*, before eventually realizing that the former was merely a juvenile of the latter (Benson, 1859j). Similarly, Benson (1859h) described *Helix calpis* as distinct before realizing that it was in fact a juvenile specimen of another of his species, *Streptaulus blanfordi* (Benson, 1857).

One name made available by Benson has been overlooked by later workers. The original description of the cephalaspidean gastropod *Bullacta caurina* dates from Benson (1842), and not Benson (1855a) as sometimes supposed (e.g. Malaquias, 2010), and therefore has priority over the widely used name *Bullacta exarata* (Philippi, 1849) with which it had been synonymised.

Several taxa have been erroneously attributed to Benson. For example, several people (e.g. Smith, 1992: 39; Stanisic et al., 2010: 72) have cited Benson as the authority for *Pupa strangei*, an Australian diplommatinid that should be attributed to Pfeiffer (1854b). Considerable ambiguity surrounded the authorship of *Helix rariplicata* Benson 1850, which has similarly been attributed to either Benson or Pfeiffer before the issue was clarified by the former as an aside in a later publication (Benson, 1850b). Authorship of several other taxa has proved even more problematic, especially where the original description refers to the names as "Benson MSS" or "Mus. Bens". In these cases, names have been attributed to Benson only if there is clear evidence that he provided the description rather than he just suggested the name or provided the specimen. A particularly difficult

problem relates to the authorship of taxa described in Hutton and Benson's joint paper of 1838 because the paper was clearly written by Hutton, who attempted to apportion credit for their respective contributions by adding their initial (H or B) after the brief descriptions of each species for which they were responsible. Ambiguity arises because Hutton's name immediately follows the new binomials but Benson's initial follows the formal descriptions. Where this is the case, we assign authorship to Benson, who provided the description, rather than to Hutton, who did not. Our treatment therefore differs from previous listings, where authorship in such cases has always been assigned to Hutton.

A complete evaluation of specimens belonging to taxa described by Benson has now been undertaken as part of this study. This appraisal has allowed us to make informed judgements about the status of critical specimens and to evaluate whether they formed part of the type series. The evaluations were based not only on published descriptions but also on unpublished correspondence and other archival evidence. This evaluation has prompted us to designate 19 lectotypes and 41 neotypes (**Tables 5 and 6**) in order to clarify the identity of certain taxa and to stabilise taxonomic nomenclature. The present work was never intended to provide a comprehensive taxonomic revision of the taxa described by Benson and we have essentially followed usage in the *Fauna of British India* series. However, we have taken account of later work and updated our systematic treatment accordingly. In a few cases it has been necessary to assign Benson taxa to more appropriate genera. For example, *Cyclostoma filicinctum* and *C. orbiculatum*, which have always been regarded as land snails, are assigned to the marine genus *Circulus* (Vitrinellidae); *Clea annesleyi* clearly belongs to *Nassodonta* and is a nassariid (cf. Strong et al., 2017); *Pupa ofella* is obviously a juvenile *Gulella* (Streptaxidae) and *Cyclostoma milium* is not a hydrocenid but a gastrocoptid that can be assigned to the recently described genus *Angustopila* (cf. Páll-Gergely et al., 2015c). *Pupa diopsis* and *P. seriola* do not belong in *Pupilla* and are tentatively transferred to *Vertigo*, and *P. brevicostis* is transferred to *Insulipupa* (Vertiginidae). Moreover, dissection of spirit material of *Succinea orientalis* shows that this belongs to the genus *Oxyloma* (Succineidae). Other nomenclatural acts include the transfer of *Camptonyx* from the Succineidae to a provisional placement in the Lymnaeoidea, and the recognition that *Tanychlamys* Benson, 1834 has priority over *Macrochlamys* Gray, 1847.

TABLE 5. List of lectotype designations

	Species	specimen selected	reason for designation
1	*Neritina depressa* Benson, 1836	NHMUK 1841.7.23.27	identification of a type specimen
2	*Cyclostoma malayanum* Benson, 1852	UMZC I.103870	identification of a type specimen
3	*Cyclostoma cuspidatum* Benson, 1851	UMZC I.103720.A	replacement of invalid neotype designation
4	*Rhiostoma haughtoni* Benson, 1860	UMZC I.103445.A	replacement of invalid lectotype designation
5	*Pupina peguensis* Benson, 1860	NZSI M.32940/9	replacement of invalid "holotype" designation
6	*Cyclostoma funiculalum* Benson, 1838	UMZC I.102140.A	identification of a type specimen
7	*Melania stephanus* Benson, 1836	NHMUK 1841.7.23.30	identification of a type specimen
8	*Plectoplyis brachyplecta* Benson, 1863	UMZC I.103145.A	replacement of invalid lectotype designation
9	*Helix vorticialis* Benson, 1850	UMZC I.103605.A	replacement of invalid lectotype designation
10	*Helix dumeticola* Benson, 1851	UMZC I.104960.A	replacement of invalid lectotype designation
11	*Bulimus salsicola* Benson, 1857	UMZC I.102800	replacement of invalid lectotype designation
12	*Helix humilis* Benson, 1838	UMZC I.102010.A	identification of a type specimen
13	*Clausilia aculus* Benson, 1842	OUMNH.ZC.MO2557-01	identification of a type specimen
14	*Clausilia loxostoma* Benson, 1836	UMZC I.102030.A	identification of a type specimen
15	*Helix turbiniformis* Benson, 1838	UMZC I.102405.A	identification of a type specimen
16	*Vitrina scutella* Benson, 1859	UMZC I.102760	identification of a type specimen
17	*Helix gordoniae* Benson, 1863	UMZC I.103415	identification of a type specimen
18	*Helix oldhami* Benson, 1859	UMZC I.104645.A	identification of a type specimen
19	*Novaculina gangetica* Benson, 1830	UMZC I.102125.A	identification of a type specimen

Most of the taxa described by Benson have type localities in the Indian subcontinent but it is worth considering the geographical coverage in a little more detail. Using modern political boundaries, the number of Benson taxa described from each country or island group is shown in Table 3 (see also Appendix 3). Most were described from India (219 taxa), where the geographical coverage included biodiversity hotspots rich in endemics, such as the Western Ghats (Raheem et al., 2014), as well as some remote mountainous regions in the north of the country. Some specimens from these regions were found in flood debris (for example, *Pupilla eurina*) and are therefore likely to have originated from Nepal or other neighbouring countries to the north. Benson also described a large number of species from Burma based on material that

TABLE 6. List of neotype designations

	Neotype designations:	**specimen selected**	**reason for designation**
1	*Cyclophorus scurra* Benson, 1857	UMZC I.102665	holotype cannot be identified
2	*Cyclophorus cryptomphalus* Benson, 1857	NHMUK 20130114/1	holotype cannot be identified
3	*Cyclostoma quadrifilosum* Benson, 1852	UMZC I.104675.A	original type series cannot be identified
4	*Cyclophorus tomotrema* Benson, 1857	NHMUK 1888.12.4.312	no surviving type material
5	*Leptopoma apicatum* Benson, 1856	NHMUK 20190426/1	surviving Benson collection material not *apicatum*
6	*Cyclostoma orophilum* Benson, 1853	NHMUK 1850.5.8.6	no surviving type material
7	*Alycaeus sculptilis* Benson, 1856	UMZC I.102845.A	holotype cannot be identified
8	*Alycaeus gemmula* Benson, 1859	NHMUK 1906.4.4.55	holotype cannot be identified
9	*Alycaeus hebes* Benson, 1857	NHMUK 1888.12.4.908	surviving Benson collection material not *hebes*
10	*Diplommatina pachycheilus* Benson, 1857	UMZC I.102595.A	holotype cannot be identified
11	*Cyclostoma wahlbergi* Benson, 1852	UMZC I.103820.A	holotype cannot be identified
12	*Pomatias himalayae* Benson, 1859	UMZC I.102695.A	surviving material not unequivocally Benson coll.
13	*Cataulus austenianus* Benson, 1853	NHMUK 1912.8.16.310	surviving material not unequivocally Benson coll.
14	*Cataulus decorus* Benson, 1853	NHMUK 1912.8.16.307	surviving Benson collection material not *decorus*
15	*Megalomastoma gravidum* Benson, 1856	NHMUK 1888.12.4.863	surviving Benson collection specimens all have opercula
16	*Paludomus ornata* Benson, 1856	NHMUK 1888.12.4.1890	no surviving type material
17	*Helix hyptiocyclos* Benson, 1863	NHMUK 1864.5.14.4	no surviving type material
18	*Glessula scrutillus* Benson, 1860	NHMUK 1888.12.4.1279	replacement of invalid lectotype designation
19	*Glessula veruina* Benson, 1853	NHMUK 1912.8.16.306	no surviving type material
20	*Achatina hastula* Benson, 1860	NHMUK 1906.1.1.880	no surviving type material
21	*Streptaxis cingalensis* Benson, 1853	UMZC I.103945.A	surviving material not unequivocally Benson coll.
22	*Streptaxis sankeyi* Benson, 1859	UMZC I.102740.A	holotype cannot be identified
23	*Ennea vara* Benson, 1859	NHMUK 1888.12.4.604	no surviving type material
24	*Plectopylis cyclaspis* Benson, 1859	UMZC I.102700.A	holotype cannot be identified
25	*Helix mononema* Benson, 1853	NHMUK 1912.8.16.349	holotype cannot be identified
26	*Succinea orientalis* Benson, 1851	NHMUK 20180282/1	original type series cannot be identified
27	*Tornatellina cernica* Benson, 1850	UMZC I.104940.A	original type series cannot be identified
28	*Mirus panos* Benson, 1853	NHMUK 1912.8.16.326	no surviving type material
29	*Mirus stalix* Benson, 1863	UMZC I.103275.A	surviving material not unequivocally Benson coll.
30	*Pupa acarus* Benson, 1856	NHMUK 1912.8.16.370	no surviving type material
31	*Pupa avanica* Benson, 1863	NHMUK 1906.2.2.187/1	no surviving type material
32	*Clausilia ceylanica* Benson, 1863	NHMUK 1954.6.2.1062	no surviving type material
33	*Helix arx* Benson, 1859	UMZC I.102575.A	surviving material not unequivocally Benson coll.
34	*Helix convallata* Benson, 1856	NHMUK 1888.12.4.2080/1	surviving Benson collection material not from type locality
35	*Helix aspides* Benson, 1863	UMZC I.103795.A	holotype cannot be identified
36	*Helix consepta* Benson, 1860	NHMUK 1888.12.4.2052	surviving Benson collection material not from type locality
37	*Helix bascauda* Benson, 1859	NHMUK 1888.12.4.509	no surviving type material
38	*Helix macropleuris* Benson, 1859	NHMUK 1906.2.2.155/1	holotype cannot be identified
39	*Helix bifoveata* Benson, 1856	NHMUK 1888.12.4.1454	no surviving type material
40	*Helix fritillata* Benson, 1863	NHMUK 1888.12.4.1085	no surviving type material
41	*Helix peguensis* Benson, 1860	NHMUK 1906.2.2.296	no surviving type material

he had been sent from various collectors. He also received important collections from the Andaman Islands and Australia, neither of which he visited, as well as from Sri Lanka, Mauritius and South Africa, which he was able to visit. The other major batch of species that he described came from "Chusan", China, which he received from Theodore Cantor. In total he described material from 18 countries or islands as listed on Table 3, mostly centred on the Indian subcontinent.

Benson understood the importance of geographical information and was meticulous in recording locality data. Regrettably, much of Benson's original locality data has now been lost or degraded, mostly at the hands of Sylvanus Hanley and Robert McAndrew (see Introduction). Many of his specimen localities appear on their replacement labels simply as "Ind.", meaning British India, a term that now subsumes several independent countries. For material sent to him, Benson accepted the stated localities at face value but these may not always have been reliable. For example, he received a shell that he subsequently named *Pupa regia* that was supposed to have come from Nanking, China (Benson, 1849c). However, this species belongs to the genus *Cerion*, which lives almost exclusively on islands in the West Indies, and is otherwise unknown in China (Pilsbry, 1901–1902). Some of these errors were corrected by his contemporaries, notably William Theobald, who published clarifications relating to the localities of specimens described by Benson (e.g. Theobald, 1857). Other confusion regarding localities appears to relate to simple errors of transcription as the Benson collection changed hands. For example, McAndrew's replacement label for *Cyclostoma sarritum* claims that this came from "China", which is clearly a transcription error for "Cherra" (i.e. Cherra Poonjee), its type locality.

Benson mistook a few introduced species found on Atlantic islands as undescribed endemics. From St Helena he described *Helix remota*, conspecific with *Oxychilus alliarius*, and *Achatina veru* that is likely to be a synonym of *Cecilioides acicula*, as is *Achatina spiculum* from the Cape Verde Islands. *Clausilia ceylanica* (now *Phaedusa ceylanica*) that he described from Sri Lanka, however, does appear to be distinct but it has not been found in natural habitats and may have been introduced from an as yet unknown native range.

Only a small proportion of the specimens in Benson's collection are labelled "type" and it is clear that not all such specimens form part of the type series. They do at least all come from the "Benson collection" and are therefore useful in helping us understand what Benson meant when using certain names. However, it is important to strike a note of caution here and remember Godwin-Austen's warning that not all so-called types are what they purport to be (Blanford and Godwin-Austen, 1908: 54). Several such examples have come to light during this project. A clear example relates to specimens of *Planorbis trochoideus* from the "Nilgherries" (UMZC I.102215), which are labelled as the "type" (i.e. syntypes). Despite the claim of type status, these shells cannot have been part of the type series because they do not come from the type locality (Barrackpore), unlike UMZC I.102220, which is here regarded as a syntype lot. A further example of misattribution of type status relates to *Helix travancorica*. Blanford and Godwin-Austen (1908: 59) mentioned a "type" specimen of *Helix travancorica* in the UMZC (now registered as UMZC I.103530.B), identified as such by W.T. Blanford, but this is a completely intact shell and cannot be Benson's type since that was said to have apertural damage (Raheem et al., 2014: 103–104). The genuine type appears to be UMZC I.103530.A, which has a damaged aperture and closely matches Benson's description (Raheem et al., 2014: 103–104).

Muddles do occur, however, and there are instances where specimens have been misidentified. For example, specimens labelled *Paludomus stephanus*, *Alycaeus hebes* and *Helix petrobia* do not match the original descriptions of those species, indicating that mislabelling has occurred. This also applies to *Achatina pachycheila*, where there is a discrepancy between the measurements given by Benson (1853c) and specimens purporting to be this species in the NHM and UMZC, which are considerably smaller. A specimen purporting to be *Cataulus decorus* in the UMZC was figured as such by Hanley and Theobald (1874 [in 1870–1876]: 43, Pl. 106, Fig. 5; see Fig. 37B) but it is in fact *Cataulus colletti* Sykes. Specimens purporting to be syntypes of *Achatina erecta* are present in the collections of the ZSI (M2262 4/4), the NHM (NHMUK 1842.9.30.1013) and the OUMNH (OUMNH.ZC.MO25558) but the ZSI specimens belong to a different species, *Allopeas gracilis*. This can be attributed to the loss of labels that occurred in the Asiatic Society Museum prior to the transfer of specimens to the ZSI. In erecting the genus *Tortaxis*, Pilsbry misinterpreted the identity of *Achatina erecta* as represented by the type material in the NHM and the OUMNH, which correspond with *Paropeas achatinaceum* (L. Pfeiffer). This was resolved by a proposal by Naggs (1992) to suppress *Achatina erecta* sensu Benson and designate NHMUK 1991104A as a neotype thus conserving the established understanding of *Tortaxis*. This was accepted by the ICZN (Opinion

1766). There are likely to be other undetected instances of mislabelling, which may come to light during detailed systematic revisions of particular families.

These examples highlight some of the difficulties involved in the recognition of "type" material, but the process would have been much easier had the Benson collection gone straight to Cambridge without passing through Hanley's hands and greater certainty would have been possible had all the original Benson labels survived. However, unless there is evidence to the contrary, we consider it likely that if the name, number of specimens and locality do not conflict with those given in Benson's original description, then this material probably represents the type series. Such documentation is often incomplete or lacking and judgements regarding type status have to be made on the balance of probability. For example, molluscan material from Chusan was collected by Cantor during a single expedition to the island in 1840 and was passed to Benson for study. Some of this material remained in Benson's collection and is present in both the UMZC and NHM. However, the OUMNH also has 14 lots of shells from Chusan collected by Cantor. We assume that these shells were identified for Cantor by Benson and that they are syntypes. Benson shared his specimens with a number of contemporary workers but without clear documentation or other evidence to support a direct link to Benson, such material cannot be recognised as being part of the type series.

Other problems have come to light when certain designated lectotypes were compared with Benson specimens in the UMZC. For example, paralectotypes of "*Velorita quilonica*" [i.e. *Corbicula quilonica* Benson] from "British India", labelled by Hanley as "the types" (UMZC I.103195), have a more rounded outline and less triangular form (Fig. 112 C) than the lectotype in the collection of the MCZH (MCZ 187460, Fig. 112 B) designated by Johnson (1959: 468), raising doubts about whether the two are really conspecific.

Difficulties have also arisen in relation to the selection of lectotypes. Article 74 of the Code states that lectotypes can only be selected from syntypes. However, in a number of cases it is now clear that this has not happened and that lectotypes have been designated from specimens that are clearly not syntypes. For example, Benson's original description of *Megalomastoma gravidum* explicitly stated that the weathered specimens were devoid of opercula, so the inclusion of UMZC I.102935 in the type series and its designation as a lectotype by Kongim et al. (2013: 26) is invalid since this shell has an operculum. The lectotype of *Helix brachyplecta* Benson, 1856, designated by Páll-Gergely and Hunyadi (2013), was based on a shell from the J.S. Hawkins collection but careful scrutiny of the Hawkins archive has revealed that this was one of a number of shells from Moulmein given to Hawkins by Robert Gordon, not Benson, and it is therefore not a syntype. Likewise the lectotype of *Glessula scrutillus*, designated by Raheem et al. (2014), was based on a shell from the Theobald collection, and the lectotype of *Helix dumeticola*, designated by Herbert and Mousalli (2016), used a specimen from the Edgar Layard collection, neither of which were syntypes.

Another invalid lectotype designation relates to *Bulimus salsicola* described by Benson (1857a) from the Salt Range in the Punjab. Gude (1914a: 249) believed the type specimen in the UMZC to be lost: "The type of *E. salsicola* appears to have shared the fate of several other Bensonian types, for Dr. Doncaster informs me that it cannot be found." However, a shell labelled by McAndrew "*Bulimus* (*Petraeus*) *Salsicola* Bens., Bens. col., Punjab" (UMZC I.102800), found in the general collection, appears to be the missing type. Annandale and Rao (1923: 390) reported that the series collected by Theobald and described by Benson was still intact in the Indian Museum. To show the variation of shell form within this species, they illustrated two contrasting specimens, which they invalidly designated as lectotypes, failing to realise that such a designation must relate to a single specimen from the type series.

Invalid type designations are not restricted to lectotypes but similarly apply to a recent neotype designation. The recent discovery of four shells of "*Cyclophorus cuspidatus* Bens." (UMZC I.103720) from the "Nilgherries" in the Benson collection can be recognized as part of the type series, rendering the designation of a neotype for this species invalid (cf. Raheem et al., 2014: 36). These shells had been overlooked because they formed part of the general collection from which type material had supposedly already been separated.

Syntypes of several other Benson taxa were located in the general collection in the UMZC, including several other supposedly missing types. Benson (1863c) based his description of *Pupa serrula* (now *Gastrocopta serrula*) on a single shell, which Gude (1914a: 293) could not locate, but UMZC I.104910 labelled "*Pupa serrula* Bens" from "Cent. Ind. [Central India]" matches the description and can be recognized as the missing type. Two further specimens have come to light that are worthy of further comment. The first concerns a specimen labelled by McAndrew "*Pupa Ofella* Bens." (UMZC I.104665) from "Liberia". The interest here is that Benson (1864a)

spoke of this minute shell being "long mislaid", which implies that this specimen must have re-surfaced after 1864, assuming that it is identical with the formerly missing shell. The second specimen worth noting is that of *Carychium boysianum* because, although this specimen was not labelled as such, it is clear from the locality (Taj Agra) and the associated species (i.e. *Achatina* [*Cecilioides*] *balanus*) that this must represent the original specimens referred to by Benson (1864c). This discovery enables us to refute the suggestion by Gude (1914a: 291) that *C. boysianum* is a synonym of "*Bifidaria huttoniana*" and conclude that it is a synonym of *Carychium indicum*.

Other examples of re-discovered types relate to specimens in the Benson collection but not to species that can be attributed to him. According to Gude (1914a: 238) the type of *Bulimus boysianus* "like so many of Benson's has apparently gone astray." However, the locality ("Kumaon") of the shell of *Pseudonapaeus boysianus* (Reeve, 1849) from the Benson collection (UMZC I.105220) matches that of the original description, and it therefore seems a likely candidate to be the missing type. Similarly, Gude (1914a: 269) noted that the type of *Bulimus segregatus* Reeve appears to be lost but lot UMZC I.105140 came from the type locality (Simla) and appears to represent the type series.

We have been able to trace about 93% of the molluscan taxa described by Benson in his collections at the UMZC (72%) and at the NHM (21%). Other Benson syntypes remained in India, initially as part of the collections of the Asiatic Society, although the history of these specimens is complicated by numerous transfers of material between the Asiatic Society Museum, the EIC's India Museum in London and the Indian Museum in Calcutta. For many years the collections of the Society suffered because of a lack of suitable curatorial staff (Mathew, 2015). The situation did not seem to improve after the EIC were persuaded to finance the position of a curator. Edward Blyth was recruited from England and began his tenure of the curator's post in 1841. Although some supported his activities relating to the collections, others felt that he had pursued grandeur in research at the expense of basic care of the collections. The shell collections, in particular, seem to have suffered serious neglect and degradation during the 1840s, as outlined in various reports prepared by the Natural History Section of the Society (Grant et al., 1848; Naggs, 1997: 45–48). Some years later, Theobald (1860) arranged and catalogued the shell collections and noted that the donors and localities of many shells were now unknown. It is therefore likely that a number of Benson syntypes were lost (or rendered unidentifiable) as a result of this period of poor curation.

The collections of the Asiatic Society were transferred to the Indian Museum in Calcutta upon its foundation in 1866. Some additional material may have gone astray at this point. Once in the Indian Museum, however, the shell collections began to receive better treatment in the hands of Geoffrey Nevill, who had some experience in malacology. The Indian Museum that had recently purchased his collection of molluscs, appointed him as their first Assistant Secretary. However, he was forced to resign through ill-health in 1883, when he returned to Europe, where he died in 1885 (Anon, 1914). During his tenure as Assistant Secretary, Nevill (1878, 1885) published two parts of a catalogue of the Mollusca then represented, which included several probable Benson syntypes. However, of the 14 species that Benson described from the Asiatic Society's collections, only three type series are known to have survived (Naggs, 1997: 57). Annandale and Rao (1923: 390) had criticized Gude for not being aware that "many Benson types are in the Indian Museum" but they failed to distinguish between material that was sent to Benson by Theobald, which would have included syntypes, from additional specimens subsequently deposited in Calcutta by Theobald that were never part of the type series. In 1916 these shells collections were transferred to the ZSI in Kolkata, where they now reside.

Of the other unlocated taxa, some such as the slugs (e.g. *Incilaria bilineata*) probably did not survive because of the difficulties in preserving soft tissue, although this was one of the species dispatched by Cantor to the EIC's India Museum in London and listed as present in that collection by G.B. Sowerby I (NHMUK ZOO_MS_89: 89 f S). Benson makes it clear that most of the minute pteropods (e.g. *Balantium bicarinatum*) that he caught on the ocean voyages did not survive the journey, often because he only possessed inferior preservatives. He also stated that other delicate shells subsequently broke and were not kept. There remains the possibility that other missing specimens still survive somewhere, possibly even in the collections that have been reviewed here, and hopefully some of these may eventually come to light.

It is not clear how many of the species that Benson described are extant. Within the modern boundary of India some 1129 species of land snail belonging to 140 genera and 26 families have been recorded (Ramakrishna et al., 2010). Many of these occur in biodiversity hotspots such as the Western Ghats, which supports 277 species of land snail belonging to

64 genera in 23 families (Raheem et al., 2014). Some 72% of Indian land snails are endemic to this region. Many land snails have restricted ranges of less than 5 km^2 and many endemic species have ranges of less than 10 km^2 (Cameron, 1998). According to Solem (1984) nearly half of all terrestrial molluscs have a range of less than 100 km^2. In the case of the Western Ghats, species present in the southern region are absent in the north and there is little overlap between the southern and central, and central and northern regions (Sen et al., 2012; Raheem et al., 2014). Nearly 75% of land snails from the Western Ghats have been reported from fewer than three sites (Sen et al., 2012: Fig. 1). Species with such restricted ranges are clearly more vulnerable and prone to the risk of extinction.

Despite the efforts of the ZSI and other organizations, the molluscan fauna of India remains rather poorly known and many species remain to be discovered. However, the human population of India and other Asian countries has increased enormously since Benson was collecting in the 1830–1840s, and large areas of native forest have been fragmented or cleared and other habitats have undergone severe degradation since this time. Similar concerns relate to some of the freshwater species described by Benson because some of the rivers from which he collected specimens are now dry, have undergone major engineering works or have become severely polluted. However, it is encouraging to note that many of the brackish and freshwater taxa that Benson described from the Hugli ("Hoogli") River system still survive in parts of it (Roy and Nandi, 2012), although Tolly's Nullah now has far less water and is almost dry. The impact on the native biota has been devastating and large numbers of species have undergone serious declines and many may have become extinct (e.g. Lydeard et al., 2004; Sen et al., 2012; Naggs, 2017). Arthropods are likely to have suffered most because of their sheer diversity and abundance but their losses are hard to gauge because they have essentially vanished without a trace (e.g. Dunn, 2005; Fonseca, 2009). This is not the case with land snails, which leave shells as evidence of their former existence, allowing more accurate assessments to be made of their losses (e.g. Régnier et al., 2009, 2015a; Richling and Bouchet, 2013). Such assessments have proved valuable in estimating the magnitude of recent biodiversity loss as a whole and the reality of the current mass extinction crisis (e.g. Régnier et al., 2015b; Naggs, 2017).

Until recently, nearly all recorded land snail extinctions are from island faunas that once supported a whole range of endemic species. These have vanished for a variety of reasons including loss of indigenous habitats (usually forest) and introduction of alien species, which are common outcomes following the arrival of humans, both recently (e.g. Richling and Bouchet, 2013) and in prehistory (e.g. Preece, 1998). Mauritius, for example, once supported 81 endemic species of land snail, of which 36 are now thought be extinct, including several of those described by Benson (Griffiths and Florens, 2006). These losses can be linked both to a major decline of indigenous forest (falling from 82.5% cover in 1773 to <2% cover in 1997) but also to the introduction of a range of non-native snail predators (Griffiths and Florens, 2006: Fig. 11, Table 3). The extinction of several endemic land snail species (now placed in *Chilonopsis*) on St Helena had already occurred before Charles Darwin's visit to the island on his return leg of the *Beagle* voyage in 1836. Darwin (1839: 470) concluded that the snails, then known only from empty shells, became extinct following the loss of their forest habitat and noted that "there can be little doubt that this change of vegetation affected not only the land-shells, causing eight species to become extinct, but likewise a multitude of insects".

Information regarding losses from continental areas is much more difficult to determine because the faunas of these much larger regions are generally not as well known, but it is clear that large-scale continental extinctions are taking place (Naggs, 2019). In the case of India, where Benson undertook most of his work, it seems that a number of extinctions of land snails may have occurred as the result of habitat loss. For example, the ZSI State Fauna review of Meghalaya (Subba Rao et al., 1995) recorded only 56% of the previously recorded fauna (105 out of 188 species). In her review of molluscan diversity around the world Kay (1995: 57) went so far as to state "That work of the early British conchologists can never be repeated as much of India no longer appears to support native terrestrial molluscan faunas. Centuries of habitation associated with massive deforestation have resulted in the disappearance of virtually all natural habitats …. The characteristic fauna of peninsular India has been virtually eliminated except for small but rapidly dwindling pockets; and there are virtually no land snails at all on the Indo-Gangetic plain, the most densely populated part of India". Kay certainly overstated the case but there is no doubt that habitat loss has been serious and extinctions of at least some of the species illustrated here seems likely. We hope that this publication will prompt a spate of further fieldwork in relevant regions. Only then will we be able to assess the changes that have occurred since Benson's collecting days in the 1830s and 1840s and the magnitude of the loss of molluscan diversity.

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APPENDIX 1. Benson's Scientific Career

William Benson's scientific career, assembled from dates and places provided in his published papers (if given), and from surviving correspondence and specimen labels. Papers are listed in order of publication, and where known precise publication dates are given. Dates for *Proceedings of the Zoological Society of London* follow Sclater (1893) and *Transactions of the Entomological Society of London* follow Wheeler (1912). Mathews (1925) listed the publication date for parts of *Annals and Magazine of Natural History* (*A.M.N.H.*) as the 1st of each month, which is generally compatible with the dates of writing appended to Benson's articles; in one case, however (Benson, 1856g) the suggested publication date is earlier than Benson's date of writing. Dates for the *Calcutta Journal of Natural History* (*C.J.N.H.*) are accepted as published. We have inferred the month of publication for issues of the first series of *Journal of the Asiatic Society of Bengal* (*J.A.S.B.*) mainly from the dated minutes of the Society's *Proceedings* published in each issue; after March 1835, these took place in the first week of the following month. In the case of Vol. 5, No. 60 of *J.A.S.B.*, which did not include any Society proceedings, we have inferred a January 1837 publication date from the fact that the part included a complete set of meteorological observations for the month of December 1836.

W.H. Benson's Scientific Career	Residence	Summary of key events	Papers written (as cited in this volume)	Date of Publication	Place of Writing	Date of Writing	Measurement system
Early Civil Service career: First period in India (October 1821 to January 1832)	**India**	Earliest record of collecting molluscan specimens: 1824 (*Unio favidens*) End of 1828: sent specimens to G.B. Sowerby	1829b, *Gleanings in Science* Vol. 1, No. 2	February, 1829			none given
			1829d, *Gleanings in Science* Vol. 1, No. 9	September, 1829			
			1829e, *Gleanings in Science* Vol. 1, No. 12	December, 1829			
			1829c, *Gleanings in Science* Vol. 1, No. 12	December, 1829	Bundelkhand	28th October,, 1829	
			1829a, *Gleanings in Science* Vol. 1, No. 12	December, 1829			
			1830a, *Gleanings in Science* Vol. 2, No. 13	January, 1830	Bundelkhand	October, 1829	
			1830b, *Gleanings in Science* Vol. 2, No. 14	February, 1830			
			1830c, *Gleanings in Science* Vol. 2, No. 16	April, 1830	Bundelkhund	9th February, 1830	
		January 25th, 1832: left India for England on furlough	1832, *J.A.S.B.* Vol. 1, No.1 - January 1832	January, 1832	Calcutta	17th January, 1832	
Furlough in Europe (January 1832 to January 1835)	**England**	Exhibited specimens at the Zoological Society, visited G.B. Sowerby I to examine and exchange specimens and wrote two papers while on leave			-	-	
			1834a, *Proc. Zoo. Soc. Lond.*	25th October, 1834	-	-	none given
			1834b, *Proc. Zoo. Soc. Lond.*	25th October, 1834			
Later Civil Service career: Second period in India (February 1835 to 1845)	**India**	January 23rd, 1835: arrives back in India	1835b, *J.A.S.B.* Vol. 4, No. 39 - March 1835	March, 1835	Calcutta	21st February, 1835	inches
			1835c, *J.A.S.B.* Vol. 4, No. 40 - April 1835	May, 1835	Calcutta	March, 1835	none given
			1835a, *J.A.S.B.* Vol. 4, No. 44 - August 1835	September, 1835	-	-	none given
			1835d, *Zool. J.* Vol. 5, No. 20	5th December, 1835	-	-	inches
			1836c, *J.A.S.B.* Vol. 4, No. 48 - December 1835	January, 1836	-	-	none given
			1836a, *J.A.S.B.* Vol. 5, No. 54 - June 1836	July, 1836	-	-	inches, poll
			1836b, *J.A.S.B.* Vol. 5, No. 59 - November 1836	December, 1836	-	-	inches, poll
			1837a, *J.A.S.B.* Vol. 5, No. 60 - December 1836	January, 1837	-	-	poll
			1837d, *J.A.S.B.* Vol. 5, No. 60 - December 1836	January, 1837	-	-	none given
			1837b, *J.A.S.B.* Vol. 6, No. 62 - February 1837	March, 1837	-	-	poll
			1837c, *J.A.S.B.* Vol. 6, No. 64 - April 1837	May, 1837	-	-	none given

W.H. Benson's Scientific Career	Country of Residence	Summary of key events	Papers written (as cited in this volume)	Date of Publication	Place of Writing	Date of Writing	Measurement system
Second period in India (February 1835 to 1845) cont.	**India**		1838a, *J.A.S.B.* Vol. 7, No. 75 - March 1838	April, 1838	-	-	inches, lines
			1838b, *J.A.S.B.* Vol. 7, No. 77 - May 1838	June, 1838	Bareilly, Rohilkund	March, 1838	none given
		Has homes in Moradabad and the hill station at Landour, where he owned the property "Rockville"	1842a, *C.J.N.H.* Vol. 2, No. 6	July, 1841	Moradabad	31st May, 1841	none given
			1842b, *A.M.N.H.* (First Series, No. 60)	August, 1842	Moradabad*	29th December, 1841*	poll
			1843, *C.J.N.H.* Vol. 3, No. 12	January, 1843	Moradabad	24th August, 1842	none given
			1846, *C.J.N.H.* Vol. 6, No. 24	January, 1846	Rockville, Landour	September, 1845	poll
Recuperation in The Cape (April 1846 to February 1847)	**South Africa**	Single entomological paper written while convalescent for most of 1846 and 1847	1847, *Trans. Ent. Soc. Lond.* Vol. 5, No. 2	30th September, 1847	-	-	none given
Retirement in Europe (October 1848 to 1870)	**Ireland**	First post-retirement paper	1848c, *A.M.N.H.* (Second Series, No. 5)	1st May, 1848	-		none given
			1848b, *A.M.N.H.* (Second Series, No. 9	1st September, 1848	Dublin	21st June, 1848	millimetres
	England		1848a, *A.M.N.H.* (Second Series, No. 11)	1st November, 1848	Falmouth, Cornwall	18th October, 1848 and Oct. 25th, 1848 (post-script)	none given
			1849b, *J.A.S.B.* Vol. 18, No. 26 (New Series)	February, 1849	-	-	none given
			1849c, *A.M.N.H.* (Second Series, No. 20)	1st August, 1849	-	13th July, 1849	millimetres
			1849a, *A.M.N.H.* (Second Series, No. 21)	1st September, 1849	-	25th July, 1849	millimetres
			1850a, *A.M.N.H.* (Second Series, No. 27)	1st March, 1850	-	February, 1850	millimetres
			1850c, *A.M.N.H.* (Second Series, No. 29)	1st May, 1850	-	10th April, 1850	millimetres
	Europe	Convalesces in Aix la Chapelle, the English name for Aachen, a spa town now in Germany	1850b, *A.M.N.H.* (Second Series, No. 34)	1st October, 1850	Aix la Chapelle	30th July, 1850	millimetres
			1851b, *A.M.N.H.* (Second Series, No. 38)	1st February, 1851	Aix la Chapelle	23rd December, 1850	millimetres
			1851a, *A.M.N.H.* (Second Series, No. 40)	1st April, 1851	Aix la Chapelle	22nd February, 1851	millimetres
			1851c, *A.M.N.H.* (Second Series, No. 41)	1st May, 1851	Aix la Chapelle	March, 1851	millimetres
	Ireland		1851e, *A.M.N.H.* (Second Series, No. 45)	1st September, 1851	Dublin	3rd July, 1851 and 5th July, 1851 (post-script)	millimetres
			1851d, *A.M.N.H.* (Second Series, No. 45	1st September, 1851	Dublin	July, 1851 and 15th August, 1851 (post-script)	millimetres
	England		1851f, *A.M.N.H.* (Second Series, No. 48)	1st December, 1851	London	8th November, 1851	millimetres
			1852a, *A.M.N.H.* (Second Series, No. 53)	1st May, 1852	London	10th April, 1852	millimetres
			1852c, *A.M.N.H.* (Second Series, No. 58)	1st October, 1852	-	-	millimetres
			1852b, *A.M.N.H.* (Second Series, No. 59)	1st November, 1852	Malvern	16th September, 1852	millimetres
			1853a, *A.M.N.H.* (Second Series, No. 61)	1st January, 1853	Malvern	29th November, 1852 and 22nd Dec., 1852	millimetres
			1853b, *A.M.N.H.* (Second Series, No. 62)	1st February, 1853	Malvern	4th January, 1853	millimetres
			1853d, *A.M.N.H.* (Second Series, No. 64)	1st April, 1853	Malvern	17th February, 1853	millimetres
			1853e, *A.M.N.H.* (Second Series, No. 66)	1st June, 1853	London	May, 1853	millimetres
			1853c, *A.M.N.H.* (Second Series, No. 68)	1st August, 1853	London	June, 1853	millimetres
	Europe	Spent time in Nice (then part of the Kingdom of Sardinia) and Spa, Belgium	1854a, *A.M.N.H.* (Second Series, No. 74)	1st February, 1854	Nizza Maritima	December, 1853	millimetres
			1854b, *A.M.N.H.* (Second Series, No. 84)	1st December, 1854	Spa, Belgium	13th November,1854	millimetres
			1855a, *J.A.S.B.* Vol. 24, No. 63 (New Series)	1855	Moradabad*	29th December, 1841*	poll*

W.H. Benson's Scientific Career	Country of Residence	Summary of key events	Papers written (as cited in this volume)	Date of Publication	Place of Writing	Date of Writing	Measurement system
Retirement in Europe (October 1848 to 1870) cont.	**Europe**	Spent time in Nice (then part of the Kingdom of Sardinia) and Spa, Belgium	1855e, *A.M.N.H.* (Second Series, No. 85)	1st January, 1855	Spa, Belgium	24th November, 1854	none given
			1855c, *A.M.N.H.* (Second Series, No. 85)	1st January, 1855	-	8th December, 1854	millimetres
			1855d, *A.M.N.H.* (Second Series, No. 89)	1st May, 1855	Nice Maritime	22nd March, 1855	millimetres
	England		1855b, Letter to Charles Darwin	-	-	5th December 1855	none given
			1856j, *A.M.N.H.* (Second Series, No. 98)	1st February, 1856	Cheltenham	10th January, 1856	millimetres
			1856h, *A.M.N.H.* (Second Series, No. 98)	1st February, 1856	Cheltenham	12th January, 1856	millimetres
			1856e, *A.M.N.H.* (Second Series, No. 99)	1st March, 1856	Cheltenham	25th January, 1856	millimetres
			1856i, *A.M.N.H.* (Second Series, No. 100)	1st April, 1856	Cheltenham	13th March, 1856	none given
			1856g, *A.M.N.H.* (Second Series, No. 102)	1st June, 1856	Cheltenham	5th June, 1856	millimetres
			1856a, *A.M.N.H.* (Second Series, No. 103)	1st July, 1856	-	12th June, 1856	millimetres
			1856d, *A.M.N.H.* (Second Series, No. 104)	1st August, 1856	-	5th June, 1856 and 24th November, 1855	millimetres
			1856f, *A.M.N.H.* (Second Series, No. 105)	1st September, 1856	Cheltenham	30th July, 1856	millimetres
			1856b, *A.M.N.H.* (Second Series, No. 107)	1st November, 1856	-	-	none given
			1856c, *A.M.N.H.* (Second Series, No. 108)	1st December, 1856	Cheltenham	7th November, 1856	millimetres
	France		1857b, *A.M.N.H.* (Second Series, No. 111)	1st March, 1857	Cannes	15th January, 1857	millimetres
			1857a, *A.M.N.H.* (Second Series, No. 112)	1st April, 1857	Cannes	19th February, 1857	millimetres
	England		1858a, *A.M.N.H.* (Third Series, No. 5)	1st May, 1858	Cheltenham	10th April, 1858; 17th April, 1858 (post-script)	millimetres
			MS Letter to Sir W.J. Hooker	-	Cheltenham, 9 Promenade Terrace	12th April, 1858	none given
			1858b, *A.M.N.H.* (Third Series, No. 6)	1st June, 1858	Cheltenham	29th April, 1858	millimetres
			1858c, *Journal de Conchyliologie*	1st July, 1858	-	-	none given
			1859a, *A.M.N.H.* (Third Series, No. 14)	1st February, 1859	Cheltenham	12th January, 1859	millimetres
			1859g, *A.M.N.H.* (Third Series, No. 15)	1st March, 1859	Cheltenham	8th January, 1859	millimetres
			1859e, *A.M.N.H.* (Third Series, No. 15)	1st March, 1859	Cheltenham	29th January, 1859	millimetres
			1859h, *A.M.N.H.* (Third Series, No. 16)	1st April, 1859	Cheltenham	19th February, 1859	millimetres
			MS Letter to J.S. Hawkins	-	Cheltenham, 9 Promenade Terrace	23rd February, 1859	none given
			1859f, *A.M.N.H.* (Third Series, No. 17)	1st May, 1859	Cheltenham	25th March, 1859	millimetres
			1859b, *A.M.N.H.* (Third Series, No. 17)	1st May, 1859	Cheltenham	1st April, 1859	millimetres
			1859d, *A.M.N.H.* (Third Series, No. 18)	1st June, 1859	Cheltenham	30th April, 1859	millimetres
			1859j, *A.M.N.H.* (Third Series, No. 20)	1st August, 1859	Cheltenham	29th June, 1859	millimetres
			1859i, *A.M.N.H.* (Third Series, No. 20)	1st August, 1859	Cheltenham	4th July, 1859	millimetres
			1859k, *A.M.N.H.* (Third Series, No. 21)	1st September, 1859	-	11th August, 1859	none given
			1859c, *A.M.N.H.* (Third Series, No. 22)	1st October, 1859	-	26th September, 1859	none given
			1860d, *A.M.N.H.* (Third Series, No. 25)	1st January, 1860	Cheltenham	3rd December, 1859	millimetres
			1860e, *A.M.N.H.* (Third Series, No. 26)	1st February, 1860	Cheltenham	5th January, 1860	millimetres
			1860i, *A.M.N.H.* (Third Series, No. 28)	1st April, 1860	Cheltenham	1st March, 1860	millimetres
			1860b, *A.M.N.H.* (Third Series, No. 29)	1st May, 1860	Cheltenham	31st March, 1860	millimetres

W.H. Benson's Scientific Career	Country of Residence	Summary of key events	Papers written (as cited in this volume)	Date of Publication	Place of Writing	Date of Writing	Measurement system
Retirement in Europe (October 1848 to 1870) cont.	England	Corresponding and exchanging shells with J.S. Hawkins	1860h, *A.M.N.H.* (Third Series, No. 30)	1st June, 1860	-	1st May, 1860	millimetres
			1860f, *A.M.N.H.* (Third Series, No. 32)	1st August, 1860	Cheltenham	29th June, 1860	millimetres
			1860c, *A.M.N.H.* (Third Series, No. 33)	1st September, 1860	Cheltenham	31st July, 1860	millimetres
			1860g, *A.M.N.H.* (Third Series, No. 34)	1st October, 1860	-	3rd September, 1860	millimetres
			1860a, *A.M.N.H.* (Third Series, No. 36)	1st December, 1860	Cheltenham	19th October, 1860	millimetres
			1861b, *A.M.N.H.* (Third Series, No. 37)	1st January, 1861	Cheltenham	29th November, 1860	millimetres
			1861c, *A.M.N.H.* (Third Series, No. 37)	1st January, 1861	Cheltenham	30th November, 1860	millimetres
			1861d, *A.M.N.H.* (Third Series, No. 38)	1st February, 1861	Cheltenham	21st December, 1860	millimetres
			1861a, *A.M.N.H.* (Third Series, No. 42)	1st June, 1861	Cheltenham	29th April, 1861	millimetres
			MS Letter to J.S. Hawkins	-	Cheltenham, 7 Queen's Parade	29th April, 1862	-
			MS Letter to J.S. Hawkins	-	Cheltenham	8th May, 1862	-
			1862b, *A.M.N.H.* (Third Series, No. 57)	1st September, 1862	Cheltenham	7th August, 1862	millimetres
			MS Letter to J.S. Hawkins	-	Cheltenham, 7 Queen's Parade	1st November, 1862	-
			1862a, *A.M.N.H.* (Third Series, No. 60)	1st December, 1862	Cheltenham	12th November, 1862	millimetres
			MS Letter to J.S. Hawkins	-	Cheltenham, 7 Queen's Parade	6th December, 1862	-
			1863a, *A.M.N.H.* (Third Series, No. 62)	1st February, 1862	-	8th January, 1863	millimetres
			1863b, *A.M.N.H.* (Third Series, No. 65)	1st May, 1863	Cheltenham	6th April, 1863	millimetres
			1863c, *A.M.N.H.* (Third Series, No. 72)	1st December, 1863	Cheltenham	3rd November, 1863	millimetres
			1864a, *A.M.N.H.* (Third Series, No. 74	1st February, 1864	Cheltenham	26th December, 1863	millimetres
			1864c, *A.M.N.H.* (Third Series, No. 75)	1st March, 1864	Cheltenham	5th February, 1864	millimetres
			MS Letter to J.S. Hawkins	-	Cheltenham, 7 Queen's Parade	30th April, 1864	-
			1864b, *A.M.N.H.* (Third Series, No. 78)	1st June, 1864	Cheltenham	16th April, 1864	millimetres
			1864d, *A.M.N.H.* (Third Series, No. 78)	1st June, 1864	Cheltenham	16th April, 1864	none given
			1865b, *A.M.N.H.* (Third Series, No. 85)	1st January, 1865	Cheltenham	30th November, 1864	millimetres
			1865a, *A.M.N.H.* (Third Series, No. 87)	1st March, 1865	Cheltenham	30th January, 1865	millimetres

* Originally published in 1842, republished and expanded in 1855 with WHB's permission. The later version included details of the date and place of writing, which had been omitted from the 1842 publication.

APPENDIX 2. Index of Localities

The index below is primarily a compendium of the localities from which William Benson obtained material that he used to described new molluscan taxa. It includes place names as published in their original descriptions and on specimen labels. We essentially follow the format used by Raheem *et al*. (2014: Appendix), with the exception that all localities listed here are in alphabetical order and are not organized by country. We have also included localities relevant to Benson's career with the EIC (see Chronology of Events) as these are sometimes valuable in evaluation of type material.

Each entry is headed by a locality name, which is the modern-day name unless stated otherwise. Countries and regional names are in upper case. Historical names or spellings used in Benson's descriptions or on specimen labels are followed by the words 'Historical name' or 'Historical spelling' in square brackets. We define 'Historical spellings' as words with the same syllables when enunciated, whereas 'Historical names' are words with different sounding syllables. Other modern and historical names and/or transliterations are sometimes listed as 'name variants', although only those cited in publications or that appear on labels have separate entries in this index. Geo-coordinates are given in degrees (north or south latitude, east longitude) and should be regarded as approximations. Google Earth was used to locate many of these but others were pinpointed from historical references (where available) in order to reflect as closely as possible the 19th century localities that Benson would have known. In many cases, the definition and extent of regions has changed substantially since that time, especially the political divisions of countries that were part of British India. Moreover, what were once small villages may now have grown into large towns, forested areas may have been cleared and rivers may have dried up or had their courses changed. The references cited relate to geo-coordinate data, spellings of locality names and additional notes.

Abbreviations for sources are as follows:
AG Gazetteer of Australian place names (http://www.ga.gov.au/place-name/)
BBG, *The British Burma Gazetteer*, 1879
CG*, The Ceylon Gazetteer* (Casie Chitty, 1834)
EB, *The Encyclopaedia Britannica online* (www.britannica.com)
EIG, *The East India Gazetteer* (Hamilton, 1815)
EIG2, *The East India Gazetteer* (Hamilton, 1828)
FRGG*, Falling Rain Global Gazetteer Version 2.2* http://www.fallingrain.com/world/index.html
GCPC, *A Gazetteer of the Central Province of Ceylon* (Laurie, 1896)
GM, Google Maps
GSI, *A Gazetteer of Southern India, with the Tenasserim Provinces and Singapore* (Pharoah and Co., 1855)
IGI(2), *The Imperial Gazetteer of India, New Edition* (Meyer *et al.*, 1908-1931, available at http://dsal.uchicago.edu/reference/gazetteer/)
IPF, *India Place Finder* (http://india.csis.utokyo.ac.jp)
OGIS, *Ornithological Gazetteer of the Indian Subcontinent* (Lozupone *et al.*, 2004)
OPN, *Official Place Names in the Union and South West Africa.* 1951. Compiled by the Place Names Committee, Department of Education, Arts and Science. Pretoria. 376 pages.
SAG, *South African Gazetteer.* 1954. Volume 1, A-N, volume 2, O-Z. Published by the Board of Geographic Names, Interior Department Building, Washington 25, D.C. USA. (pages not numbered)
USAMS L509, *U.S. Army's 1:250,000 Topographic Map Series U542 for Indochina and Thailand* (U.S. Army Map Service, 1954-)
USAMS U502, *U.S. Army's 1:250,000 Topographic Map Series U502 for India and Pakistan* (U.S. Army Map Service, 1955-).
USAMS U542, *U.S. Army's 1:250,000 Topographic Map Series U542 for Burma* (U.S. Army Map Service, 1955-)
USDMA (ONC F-6 China, USSR), Operational Navigational Chart, 1:1,000,000, ONC F-6, China, USSR (U.S. Defense Mapping Agency Aerospace Center, 1985)
USDMA (ONC L-8 Ceylon, India, Maldive Islands), USAF Operational Navigational Chart, Scale 1:1,000,000, ONC L-8, Ceylon, India, Maldive Islands (U.S. Defense Mapping Agency Aerospace Center, 1965)
WG, World Gazetteer (www.world-gazetteer.com)

LOCALITIES

Agra
Country India
State Uttar Pradesh
Coordinates 27º 09′ N, 78º 00′ E
Reference OGIS, pp. 10, Agra city

Ahmednagar
Country India
State Maharashtra
Coordinates 19° 6′ N, 74° 45′ E
Reference USAMS U502 (NE 43-2 Ahmadnagar), IPF (Ahmadnagar)

Ahmednugger [Historical spelling], see Ahmednagar

Akauktaung
Country Burma
State Kachin State
Coordinates 25° 3′ N, 97° 5′ E
Reference FRGG (Akauktaung), BBG (vol. 2, pp. 2, Akouk-Toung)

Akaouktoung [Historical spelling], see Akauktaung

Akoutong [Historical spelling], see Akauktaung

Akouktong [Historical spelling], see Akauktaung

Akuramboda
Country Sri Lanka
Province Central Province
Coordinates 7º 39′ N, 80º 36′ E
Reference FRGG (Akuramboda)

Akurambodie [Historical spelling], see Akuramboda

Algoa Bay
A wide inlet along the South African coast, 684 km east of the Cape of Good Hope. It is bounded in the west by Cape Recife and in the east by Cape Padrone.
Country South Africa
Province Eastern Cape
Coordinates 29° 52′ S, 26° 56′ E (FRGG)

Almora
A town, district and tahsil in the Kumaun Division of the United Provinces of British India
Country India
State Uttarakhand
Coordinates Almora Town: 29º 36′ N, 79º 40′ E; Almora District: between 28º 59′ – 30º 49′ N and 79º 02′ – 81º 31′ E; Almora Tahsil: between 29º 26′ – 30º 49′ N and 79º 02′ – 80º 30′ E (in 1908).
References IGI (vol. 5, p. 243, Almora District; pp. 252, Almora Tahsil, Almora Town), FRGG

Almorah [Historical spelling], see Almora

Amsterdam Island (Île Amsterdam)
An island of the French Southern and Antarctic Lands in the southern Indian Ocean, roughly equidistant from Madagascar, Australia and Antarctica (see also Amsterdam Island).
Country France (overseas territory)
Coordinates 37° 50′ S, 77° 33′ E

ANDAMAN ISLANDS
Country India
Union Territory Andaman and Nicobar Islands
Coordinates Centred at 10º 30′ N, 92º 35′ E
Reference OGIS (pp. 13, Andaman and Nicobar Islands)

Aracan [Historical name], see Arakan

ARAKAN [Historical name]
A political division of British Burma.
Country Burma
Coordinates Between 17º 15′ – 22º 30′ N and 92º 11′ – 94º 52′ E
Reference IGI (vol. 5, pp. 389, Arakan Division)

ASSAM
A Province of British India and a modern-day state in northeastern India, bounded to the north by the Kingdom of Bhutan and the eastern section of the Himalaya. The boundaries have changed quite substantially through time; the neighbouring states of Arunchal Pradesh, Nagaland, Mizoram and Meghalaya were once part of Assam.
Country India
Coordinates Between 22º 19′–28º 16′ N and 89º 42′–97º 12′ E
References IGI (vol. 6, pp. 14, Assam), EB (Assam)

Ataran River
Country Burma
Region Mon State
Coordinates 16º 31′ N, 97º 39′ E
References GM, IGI (vol. 5, p. 293, Amherst District)

Attaran River [Historical spelling]**,** see Ataran River

Ava (or Inwa)
Country Burma
Region Sagaing Division
Coordinates 21º 51′ N, 96º 00′ E
References IGI (vol. 6, p. 151, Ava), FRGG (Ava)

Ayeyarwady River, see Irrawaddy River

Badulla
Country Sri Lanka
Province Capital of the Uva Province and the Badulla District
Coordinates 6° 59′ N, 81° 03′ E
Reference FRGG (Badulla)

Bago, see Pegu

Balasore
A town and district in the Orissa Division of Bengal Province, British India.
Country India
State Odisha
Coordinates Balasore Town: 21º 30′ N, 86º 56′ E; Balasore District: between 20º 44′ – 21º 57′ N and 86º 16′ – 87º 31′ E (in 1908).
References IGI (vol. 6, p. 236, Balasore District; p. 245 Balasore Town), FRGG

Balcadua, a pass [Historical spelling]
Country Sri Lanka
Province Central
Coordinates 7º 25′ N, 80º 37′ E
References Survey Department, Sri Lanka, 1: 63, 360-scale map series, Kurunegala sheet, revised 1941–42, printed 1965 (see Ballacadua), GCPC (pp. 90, Balakaduwa)

Banda
A town, district, tahsil and pargana in the Allahabad Division of the United Provinces of British India. The town, on the banks of the River Ken, has since grown into a city.
Country India
State Uttar Pradesh
Coordinates Banda Town: 25º 28′ N, 80º 20′ E; Banda District: between 24º 53′ – 25º 55′ N and 79º 59′ –81º 34′ E; Banda Tahsil: between 25º 20′ – 25º 38′ N and 79º 59′ – 80º 32′ E (in 1908)
Notes Banda was also the name of a north-eastern tahsil of Saugor District, Central Provinces (now in Madhya Pradesh)
References IGI (vol. 6, pp. 347, Banda District; pp. 356 Banda Tahsil, Banda Town), FRGG

Bandarawela
Name variant Bandarawella
Country Sri Lanka
Province Uva
Coordinates 6° 49′ N, 80° 59′ E
Reference FRGG (Bandarawela)

Bandarewella [Historical spelling]**,** see Bandarawela

Banaras [Historical name], see Varanasi

Bareilly
Names variants Bareli, Bareily
Country India
State Uttar Pradesh
Coordinates Bareilly City, 28º 22′ N, 79º 24′ E; Bareilly Division, between 27º 35′ – 29º 58′ N and 78º 27′ – 80º 27′ E; Bareilly District, between 28º 1′ – 28º 54′ N and 78º 58′ – 79º 47′ E; Bareilly Tahsil, between 28º 13′ – 28º 37′ N and 79º 14′ – 79º 38′ E
Notes See also Rohilkhand.
References IGI (vol. 7, pp. 1–14, Bareilly), EG (p. 86, Bareily)

Barrackpore
Name variant Barrackpoor
Country India
State West Bengal
Coordinates 22º 46′ N, 88º 22′ E
References USAMS U502 (NF 45-7 Calcutta), EG (p. 86, Barrackpoor), FRGG (Barakpur)

Barrackpur [Historical spelling]**,** see Barrackpore

Bassein [Historical name]
Most likely Bassein District of British colonial Burma or Bassein town (modern-day Pathein)
Country Burma
Region Ayeyarwady Division
Coordinates Bassein District, between 15° 50′ – 17° 30′ N and 94° 11′ – 95° 28′ E, Bassein town, 16° 46′ N, 94° 46′ E
References IGI (vol. 7, p. 106, Bassein District, p. 117, Bassein Town).

Baszaarm's Kraal
Baszaarm's (Baas Harman's or Boss Harman in English) Kraal was in what is now the Retreat area between Dieprivier and Muizenberg on the "road from Cape Town to Simonstown" (Benson, 1850b).

This whole area would have been very marshy in Benson's day.
Country South Africa
Province Western Cape
Coordinates Approximately 34° 03′ S, 18° 29′ E
Reference Botha, 1926

BENGAL [Historical name]
Bengal Province was a political division of British India and was composed of the modern country of Bangladesh, and the present-day Indian state of West Bengal, Bihar, Odisha (formerly Orissa), Jharkhand, Assam and Tripura.
Coordinates Between 19º 18′ – 28º 15′ N and 82º 00′ – 97º 00′ E
Reference IGI (vol. 7, p. 194, Bengal Province)

Berhampooter River [Historical spelling], see Brahmaputra River

Betwa River
Name variant Betwah River
A tributary of the Yamuna River, rising in the Vindyha Mountains.
Country India
States Madhya Pradesh, Uttar Pradesh
Coordinates Rises at 22º 55′ N, 77º 43′ E. Confluence with the Yamuna at 25º 55′ N, 80º 12′ E
References IGI (vol. 8, p.16, Betwā), EG (p.143, Betwah), USAMS U502 (NH 44-10 Bānda, Betwa River)

Bhagirathi River
A distributary of the Ganges River. It joins the Jalangi River at Nabadwip to form the Hooghly River. *Name variant* River of Bengal
State West Bengal
Country India
Coordinates Leaves the Ganges near Jangipur at 24º 35′ N, 88º 05′ E (IGI)
References IGI (vol. 8, p. 38, Bhāgīrathi), EB, USAMS U502 (NG 45-15 Berhampore, Bhāgīrathi River)

Bhamoury [Historical name]
Benson (1851e: 191-192) described Bhamoury as a locality at the foot of the Western Himalaya, on the road leading to Almorah, with Bhimthal as a neighbouring mountain lake. He went on to describe it as being "above the point where the Lower Himalaya springs from the forest of the Terai" (*ibid*: 193). Modern-day Bamori Malli, 3 km north of Haldwani in Nainital District, Uttarakhand, fits this description.
Name variants Bamori,?Bamori Malli
Country India
State Uttarakhand
Coordinates 29° 14' N, 79° 31' E
References Benson (1851e), EIG (p. 76, Bamori); USAMS U502 (NH 44-10 Almorā, shown as Bamori), IPF, GM (Bamori Malli)

Bhar [Historical name]
Bhar is possibly modern-day Ber in Solan District, Himachal Pradesh. Ber (1320 m, 4331 feet a.s.l.) is about 10 km southeast of Sabathu (1264 m, 4147 feet a.s.l.) and the latter is about 20 km southwest of Shimla (2198 m, 7211 feet a.s.l.). Hutton and Benson referred to this locality in their 1838 paper on the snails of the area around Simla (modern-day Shimla) and those encountered on a trek from Monimajra (modern-day Mani Majra, 331 m, 1086 feet a.s.l.) at the base of the Himalaya northeastwards to the Burenda Pass (now the Buran Pass) at an elevation of nearly 5200 m (17,000 feet) a.s.l. in the western Himalaya. Hutton and Benson (1838: 214) indicated that *Helicarion cassida* was found from "Bhar to Simla but most abundantly between the former place and Subathú", and this implies that the latter lies between Bhar and Simla.
Country India
State Himachal Pradesh
Coordinates 30º 55′ N, 72º 08′ E
References USAMS U502 (NH 43-04 Simla, Simla, NH 43-08 Ambāla, Ber, Sābathu, NH 44-01 Chīni, Buran Pass), FRGG (Mani Majra, Sabathu, Shimla), IPF (Ber)

BHEERBHOOM [Historical name], see BIRBHUM

Bhim Tal [Historical spelling]**,** see Bhimtal

Bhimtal
Country India
State Uttarakhand
Coordinates 29° 21′ N, 79° 34′ E
Reference IPF (Bhimtal)

Bhithoura [Historical name]
Benson (1862b) described Bhitoura as being next to the Ganges between Cawnpore (now Kanpur) and Allahabad. This may be modern-day Bithur (also known as Bithoor), a town on the bank of the River Ganges approximately 20 km north-northwest of Kanpur. There is doubt about this interpretation, however, as Bithur is not between Kanpur and Allahabad.
Name variants Bithoura, ?Bithur, Bithoor

Country India
State Uttar Pradesh
Coordinates ?26° 37′ N, 80° 16′ E
References EB (Bithur), FRGG (Bithur)

Bibilegama
Country Sri Lanka
Province Uva
Coordinates 6º 54′ N, 81º 08′ E
Reference FRGG (Bibilegama)

Bibligamua [Historical spelling]**,** see Bibilegama

BIHAR [Historical name]
One of the four sub-provinces that constituted the British Indian political division of Bengal Province. Modern Bihar State is a considerably larger area.
Coordinates between 23° 48′ – 23° 71′ N and 83° 20′ – 88° 32′ E
Reference IGI (vol. 8, p. 171, Bihar Sub-province).

Bijnor
May refer to the town, Tahsil or District of the same name.
Name variants Bijnaur, Bijnour
Country India
State Uttar Pradesh
Coordinates Bijnor District, between 29º 1′ – 29º 58′ N and 78º 0′ – 78º 57′ E; Bijnor Tahsil, between 29º 1′ – 29º 38′ N and 78º 0′ – 78º 25′ E; Bijnor Town 29° 22' N, 78° 8' E
References IGI (vol. 8, p. 192, Bijnor District), FRGG (Bijnor)

Bijnore [Historical spelling]**,** see Bijnor

BIRBHUM
An administrative district in the Bengal Province of British India, with an area of approximately 4538 km^2 (IGI: 239). Birbhum District now lies within the modern-day state of West Bengal.
Name variants Bheerbhoom, Beerbhoom, Birbhoom, Birboom
Country India
State West Bengal
Coordinates Between 23º 33′ – 24º 35′ N and 87º 10′ – 88º 2′ E
References EG (p. 152, Birboom), IGI (vol. 8, p. 239, Bīrbhūm)

BIRMAH [Historical spelling], see **BURMA**

Bombay [Historical name]**,** see Mumbai

Bootelle [Historical spelling]
Name variant Buttala
Country Sri Lanka
Province Uva
Coordinates: 6º 45′ N, 81º 14′ E
References FRGG (Buttala); CG (p. 24, Bootella)

Boralanda
Province Uva
Country Sri Lanka
Coordinates 6° 49′ N, 80° 53′ E
Reference FRGG (Boralanda)

Boralande [Historical spelling], see Boralanda

BORNEO, see **SARAWAK**

Brahmapootra River [Historical spelling], see Brahmaputra River

Brahmaputra River
A trans-boundary river originating in Tibet (as the Tsangpo), travelling through India (as the Brahmaputra) and modern-day Bangladesh (as the Jamuna).
Name variants Berhampooter, Brahmapooter, Brahmapootra, Burhampooter
Country India
States Assam and Arunachal Pradesh
Coordinates 26º 15′ N, 91º 51′ E
References IGI (vol. 9, p. 10, Brahmaputra); EB (Brahmaputra River)

Bredasdorpe
Country South Africa
State Western Cape
Coordinates 34º 32′ S, 20º 02′ E
Reference SAG, OPN

BRITISH INDIA [Historical name]
Provinces of India, earlier Presidencies of British India, still earlier**,** Presidency towns, and collectively British India, were the administrative units of the territories of India under the tenancy (Company Rule) or the sovereignty (Raj) of either the East India Company or the British Crown between 1612 and 1947. The term *British India* also applied to Burma for a shorter time period: starting in 1824, a small part of Burma, and by 1886, almost two thirds of Burma was included under *British India*. This arrangement lasted until 1937, when Burma commenced being administered as a separate British colony. *British India* did not apply to other countries in the region, such as Sri Lanka (then Ceylon), which

was a British Crown colony, or the Maldive Islands, which were a British protectorate.

BUNDELCUND [Historical name], see BUNDELKHAND

BUNDELKHAND [Historical name]
An area of approximately 30044 km^2 in Central India, which included districts that are now found in the modern-day state of Mahdya Pradesh and Uttar Pradesh. From 1802 the name was restricted to the political division of the Bundelkhand Agency, a collection of Princely States. This reduced area of approximately 20720 km^2 is now included entirely within Mahdya Pradesh and no longer has a political identity.
Country India
States Mahdya Pradesh and Uttar Pradesh
References IGI (vol. 9, pp. 68-74 Bundelkhand); EIG (p. 188, Bundelcund); EB (Bundelkhand)

BURMA
Burma, officially renamed the **Republic of the Union of Myanmar**, commonly shortened to **Myanmar** is a sovereign state in Southeast Asia bordered by China, Thailand, India, Laos and Bangladesh. One-third of Burma's total perimeter of 1,930 km forms an uninterrupted coastline along the Bay of Bengal and the Andaman Sea. Burma was formerly included within *British India* (see above) until 1937, when it began to be administered as a separate British colony. In 1948 it became an independent republic, named the **Union of Burma**, before being renamed the **Republic of the Union of Myanmar** in 1989. The legitimacy of the ruling military government, and its authority to rename the country, is contested and we have therefore used the name "Burma" throughout this publication.

BURMAH [Historical spelling], see BURMA

Calcutta [Historical name], see Kolkata

Camp's Bay
Name variant Camps Bay
Country South Africa
Province Western Cape
Coordinates 33º 57′ S, 18º 22′ E
Reference SAG, OPN

Cane River [Historical name], see Ken River

Cannes
Country France
Region Provence-Alpes-Côte d'Azur
Coordinates 43º 32′ N, 7º 1′ E
Reference FRGG (Cannes)

Cape [ambiguous term]
May possibly refer to: Cape Town; the Cape of Good Hope (see below); Cape Point (see below); or Cape Colony. Cape Colony was a British Colony established in 1806, encompassing the whole of southern and western South Africa. Following the Union of South Africa in 1910, Cape Colony became known as the Province of the Cape of Good Hope, which was often shortened to Cape Province.
References EB (Cape Colony, Cape of Good Hope)

Cape of Good Hope
May refer to the peninsula that extends approximately 48 km south of Cape Town (now known as Cape Peninsula), or just the rocky promontory at its southwestern tip, which is the limit of the name today. However, it is more likely that Benson used this term to refer to a wider area, as an alternative name for the Cape Colony (see above).
Country South Africa
Province Western Cape
Coordinates 18º 28′ E, 34º 21′ S
References EB (Cape of Good Hope)

Cape Pedro [Historical name], see Point Pedro

Cape Point
The promontory at the southeastern tip of the Cape Peninsula
Country South Africa
Province Western Cape
Coordinates 34° 21′ S, 18° 29′ E
Reference GM (Cape Point)

CAPE VERDE ISLANDS
Country Republic of Caba Verde
Coordinates 16° 49′ N, 24° 58′ W

Cashmeer [Historical spelling], see KASHMIR

Cassia Hills [Historical spelling] see Khasi Hills

Cén River [Historical spelling] see Ken River

CEYLON [Historical name], see SRI LANKA
British Ceylon, known contemporaneously as **Ceylon**, was a British Crown colony between 1815 and 1948 and was not part of *British India* (see above). Initially the area it covered excluded the Kingdom of Kandy, which was a protectorate from

1815, but from 1817 to 1948 the British possessions included the whole island of Ceylon, renamed Sri Lanka in 1972.

Cherrapunji
Cherrapunji has one of the highest annual levels of precipitation in the world. The highest recorded was in the year August 1860 to July 1861, which saw 1042 inches (26.47 m) of rain, of which 366 inches (9.30 m) fell in July alone.
Name variants Cherra Poonje, Cherra-poonjee, Cherrapoonjee, Cherrapunjee
Country India
State Meghalaya
Coordinates 25º 15′ N, 91º 44′ E
References IGI (vol.10 p. 194, Cherrapunji), OGIS (p. 38, Cherrapunji Plateau), EB (Cherrapunji)

Chhoeya River
Name variant Chhoea River
Country India
State Uttar Pradesh
Coordinates Centered at 29° 22' N, 78° 10' E
Reference USAMS U502 (NH 44-09 Hardwār, shown as Chhoiyā River), GM (Chhoeya, Chhoea)

Choia Nuddy [Historical name], see Chhoeya River

Chunar
Probably refers to the town of Chunar, headquarters of the Tahsil of the same name in Mirzapur District.
Country India
State Uttar Pradesh
Coordinates Chunar Tahsil, between 24º 47′ – 25º 15′ N and 82º 42′ – 83º 12′ E; Chunar Town, 25° 7' N, 82° 54' E
References IGI (vol. 10, p.332-3 Chunār Tahsil, Chunār Town), also see http://mirzapur.nic.in/default_files/Page782.htm

Chusan [Historical name], see Zhoushan

Cochin [Historical name]
May either refer to the harbour town (modern day city of Kochi); the area known as Cochin Province (as it was called in 1815); Cochin State (as it was called by 1908); or Cochin Taluk. It is possible, although much less likely in the context of the Benson Collection that it refers to Cochin China, a historical region that included parts of present-day Vietnam and Cambodia.
Name variant Kochi
Country India
State Kerala
Coordinates Cochin town: 9º 58′ N, 76º 14′ E; Cochin Taluk: 9º 58′ N, 76º 14′ E; Cochin State: between 9º 48′ – 10º 50′ N, 76º 5′ – 76º 58′ E (IGI)
References IGI (vol. 10, p. 340, Cochin State; p. 353, Cochin Taluk and Cochin Town), EIG (pp. 292-293 Cochin), FRGG (Kochi)

Colesberg
Country South Africa
Province Northern Cape
Coordinates 30º 38′ S, 24º 59′ E
Reference SAG, OPN

Comercolly [Historical name], see Kumarkhali

Cottyam [Historical spelling], see Kottayam

Cuttack
Country India
State Odisha (formerly Orissa)
Coordinates 20º 26′ N, 85º 56′ E
Reference OGIS (p. 43, Cuttack city)

Dahinkhoond [Historical spelling]
Dainkund peak, rises to 2772 m (9096 feet), and is located to the east of Dalhousie in the western Himalaya. Benson (1861d) stated that this peak was located "in the mountains near the Bari Do-âb"; the Bari Doab, according to the IGI (vol. 7, p.16, Bari Doab) is the tract of country in the Punjab between the Beas and Ravi Rivers, lying between 29º 22′ – 32º 30′ N and 71º 06′ – 75º 58′ E
Country India
State Himachal Pradesh
Coordinates 32º 32′ N, 76º 04′ N
Reference IGI (vol. 11, p. 125, Dalhousie, see Dain Kūnd peak, the longitude given for Dalhousie is incorrect), IOG (p. 43, Dalhousie), USAMS U502 (NI 43-15 Pathānkot, elevation of peak shown, but name not given), IPF (Dalhousie), http://himachaltourism.gov.in/dalhousie.php.

Damatha [Historical name]
A small village (now called Damathat) on the bank of the Gyaing River. Benson's locality relates to "Damatha Cave", part of a nearby limestone hill.
Name variants Dhammatha, Dhammathat
Country Burma
Region Mon State
Coordinates 16º 30.5′ N, 97º 48.5′ E
References BBG (vol. 2, p. 137, Dham-ma-tha), USAMS L509 (NE 47-14 Moulmein, shown as Damathat), FRGG (Damathat)

Damboul [Historical spelling], see Dambulla

Dambulla
Country Sri Lanka
Province Central
Coordinates 7° 51′ N, 80° 40′ E
Reference OGIS (p. 44, Dambulla town)

Darjeeling
Country India
State West Bengal
Coordinates 27º 02′ N, 88º 20′ E
Reference OGIS (p. 45, Darjeeling city)

Darjeerling [Historical spelling], see Darjeeling

Darjiling [Historical spelling], see Darjeeling

Darling Range
Name variant Darling Scarp, a 320 km long escarpment to the east of Perth in Western Australia.
Country Australia
State Western Australia
Coordinates Centered at 31º 59′ S, 141º 34′ E
References EB (Darling Range), AG (Darling Range)

DECCAN
The word 'Deccan' is derived from the Sanskrit 'daksina' meaning 'south'. In broad terms it refers to the whole of India south of the Narbada (now the Narmada) River and the Vindhya mountains. In its narrower usage it refers only to the area between the Narbada and the Kistna (now the Krishna) River. The term may also refer to the Deccan Plateau, which covers most of central and southern India, bordered to the east by the Eastern Ghats, and the west by the Western Ghats mountain ranges.
Name variants Dakhin, Dakshina
Country India
References IGI (vol. 11, p. 205 Deccan), EIG (p. 329), EB (Deccan Plateau)

Dehradun
The town of Deyrah (now the city of Dehradun) stands in the middle of the valley between the foothills of the Himalaya and the slopes of the Silvalik mountains.
Name variants Dehradoon, Dehra Doon, Dehra Dun, Deyrah Doon, Deyrah Dhoon
Country India
State Uttarakhand
Coordinates 30º 20′ N, 78º 5′ E
References MacDonald (1842), EB (Dehra Dun), IPF (Dehradun)

DEKHAN [Historical spelling]**,** see DECCAN

Devil's Mountain, see Devil's Peak

Devil's Peak, Cape Town
Country South Africa
Province Western Cape
Coordinates 33º 57′ S, 18º 27′ E
Reference SAG, OPN

Deyrah [Historical name], see Dehradun

Dojora River
Runs south through the Bareilly District (see "Bareilly") to meet the Ramganga River about 10 km northwest of Bareilly town.
Country India
State Uttar Pradesh
Coordinates Centred at 28º 25′ N, 79º 17′ E
Reference USAMS U502 (NH 44-13 Bareilly, shown as Dojora Nadi), IGI (vol. 7, p. 2 Bareilly District)

Durban
Formerly Port Natal
Country South Africa
Province KwaZulu-Natal
Coordinates 29° 51′ S, 31° 01′ E
Reference SAG, OPN

Ellegamme Nalande [Historical name], see Elagamuwa

Ellegamua [Historical name], see Elagamuwa

Elagamuwa, near Nalanda
Country Sri Lanka
Province Central
Coordinates 7º 40.5′ N, 80º 44′ E
References Survey Department, Sri Lanka, 1: 63, 360-scale map series, Elahera sheet, revised 1955, reprinted 1967 (see Elagamuwa)

Fagoo [Historical spelling], see Fagu

Fagu, or **Fágú** [Historical spelling]
The locality refers to forest in the vicinity of Fagu, about 20 km east of Simla (Hutton, 1837: 903-904).
Country India
State Himachal Pradesh
Coordinates 31º 04′ N, 77º 19′ E [Fagu]
Reference USAMS U502 (NH 43-04 Simla, shown as Fāgu), IPF (Fagu); see also Benson (1865b: 15)

False Bay, Cape Town
False Bay is a body of water defined by Cape Hangklip and the Cape Peninsula in the extreme South-West of South Africa.
Country South Africa
Province Western Cape
Coordinates 34º 06′ S, 18º 28′ E
Reference SAG, OPN

Farm Caves
A limestone hill ~11 km east of Moulmein containing several cave complexes.

Fort McDonald [Historical name], see also Paranagama
The British colonial fort located in the village of Paranagama.
Name variant Fort MacDonald
Country Sri Lanka
Province Uva
Coordinates 6º 57′ N, 80º 53′ E
References Survey Department, Sri Lanka, 1: 63, 360-scale map series, Nuwara Eliya sheet, revised 1976, printed 1978 (see Fort McDonald and Paranagama); CG (p. 90, Fort McDonald); FRGG (Paranagama)

Fort William
The colonial fort in the central district of Calcutta, built during the early years of the Bengal Presidency of British India.
Country India
State West Bengal
Coordinates 22º 33′ N, 88º 20′ E

Freemantle [Historical spelling], see Fremantle

Fremantle
Country Australia
State Western Australia
Coordinates 32° 2′ S, 115° 46′ E
Reference FRGG (Fremantle)

Ganges River
A trans-boundary river with its source in the Himalaya. The delta in the Bengal area is shared with the Brahmaputra River, and now lies mainly in Bangladesh.
Name variants Ganga River
Country India and Bangladesh
States In India: Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal.
Coordinates Centred at 24º 45′ N, 88º 00′ E
Reference OGIS (p. 57, Ganga River)

GANGETIC PLAIN
The low alluvial region in northern India and Bangladesh, which is formed by the Ganges and its tributaries. In India it extends across most of Uttar Pradesh and the western part of West Bengal, as well as much of Bihar.
Coordinates 28º 00′ N, 79º 00′ E – 23º 00′ N, 91º 00′ E
Reference OGIS (p. 57, Gangetic Plain)

Galle
Name could refer to the town/harbour or district
Country Sri Lanka
Province Southern
Coordinates 6° 02′ N, 80° 13′ E
References FRGG (Galle); CG (p. 93, Galle town)

Ghaghara River
The Gogra River is now known as the Ghaghara River, which rises as the Karnali on the Tibetan Plateau, and cuts through the Himalaya in Nepal and joins the Sharda River at Brahmaghat in India. The total length of the Ghaghara River up to its confluence with the Ganges in Bihar is 1080 km [670 miles]
Name variants Ghaghara, Ghaghra, Ghagra

Girnar
A hill with five principal peaks, the highest of which is 1117 m above sea level.
Name variants Girinagar, Girvar, Ujjayanta
Country India
State Gujarat
Coordinates 21º 30′ N, 70º 42′ E
Reference IGI (vol. 12, p. 247), IPF (Girnar Hills)

Gogra River [Historical name], see Ghaghara River

Green Point, Cape Town
Country South Africa
Province Western Cape
Coordinates 33º 54′ S, 18º 24′ E
Reference SAG, OPN

Gumti River
A 805 km long river with its source approximately 51 km east of Pilibhit. It joins the Ganges at Saidpur.
Country India
State Uttar Pradesh
Coordinates From 28º 35′ N, 80º 7′ E to 25º 33′ N, 83º 11′ E
Reference IGI (vol. 12, p. 384, Gumti), USAMS U502 (NH 44-14 Pīlbhīt, NG44-12, Banāras, shown as Gumtī River)

Gungun [Historical name]
Refers to the Gangan Nadi, a river falling into the Ganges southeast of Moradabad.
Country India
State Uttar Pradesh
Coordinates 28º 48′ N, 78º 45′ E (the Gangan Nadi, near Moradabad)
Reference Benson (1850b: 251), USAMS U502 (NH 44-13 Bareilly, shown as Gāngan Nadi)

Hamirpur
May refer to the town, district or tahsil of the same name, now in Uttar Pradesh.
Name variant Hameerpore
Country India
State Uttar Pradesh
Coordinates Hamirpur Town, 25º 58′ N, 80º 9′ E; Hamirpur Tahsil, between 25º 42′ – 26º 7′ N and 79º 51′ – 80º 21′ E; Hamirpur District, between 25º 5′ – 26º 7′ N and 79º 17′ – 80º 21′ E
Reference IGI (vol. 13, p. 13, Hamīrpur District; p. 21, Hamīrpur Town, Hamīrpur Tahsīl), USAMS U502 (NG 44-10 Bānda), IPF (Hamirpur)

Hattú Mountain [Historical spelling]
Historical name for Hatu Dhār or Hatu Peak near Narkanda, Shimla District (see Hutton, 1837: 906-907).
Country India
State Himachal Pradesh
Coordinates 31º 13′ N, 77º 30′ E (peak at 3185 m)
The locality at Hattú was "among the ruins of the old forts which crown that mountain. Young specimens [of '*Nanina monticola*'] were met with among junipers at Lítí, at an elevation not much under 14,000 feet [4267 m]" (Hutton and Benson, 1838: 215).
Reference USAMS U502 (NH 43-04 Simla, shown as Hatu Dhār), IPF (Narkanda), also see http://www.hptdc.nic.in/cir0105.htm

Hawee, could not be located.

Henaratgoda
Country Sri Lanka
Province Western
Coordinates 7º 04′ N, 80º 01′ E
Reference FRGG (Henaratgoda)

Heneratgodde [Historical spelling], see Henaratgoda

Hewagam Corle [Historical spelling], see Hewagam Korale

Hewagam Korale
Country Sri Lanka
Province A subdivision of the Western Province
Coordinates 6º 51′ N, 80º 06′ E
References Survey Department, Sri Lanka, 1: 63, 360-scale map series, Avissawella sheet, revised 1972, reprinted 1972 (see Hewagam Korale), CG (p. 99, Hewagam Korle)

High Constantia, Cape Town
Country South Africa
Province Western Cape
Coordinates 33º 59′ S, 18º 24′ E
Reference SAG, OPN

HIMALAYA
A trans-national mountain range separating the alluvial plains of the Indian subcontinent to the south from the Plateau of Tibet to the north. India, Nepal and Bhutan have sovereignty over the Himalaya, but they also fall within Pakistan and China. The **Indian Himalayan Region** includes twelve states (see below).
States Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Sikkim, Arunachal Pradesh, Meghalaya, Nagaland, Manipur, Mizorum, and Tripora, Assam and West Bengal.
Country India
Coordinates Spans 21º 57′ – 37º 5′ N to 72º 40′ – 97º 25′ E
References IGI (vol. 13, p. 123, The Himālayas), Nandy *et al*. (2006), EB (Himalayas)

Hoogli River [Historical spelling], see Hooghly River

Hooghly River
Name variants Hugli, Húghlí, Hoogli, Calcutta River, Bhagirathi, Gunga, Ganga, Ganges
The Hooghly River may refer to the river formed by the confluence of the Bhagirathi and Jalangi Rivers at Nadia town (now Nabadwip), or when it reaches Santipur (Shantipur), 38 km farther downstream.
State West Bengal
Coordinates According to IGI from 23º 25′ N, 88º 24′ E (Nadia town) to 22º 13′ N, 88º 4′ E (Bay of Bengal)
References EIG (p. 200, Calcutta, p. 416 Hooghly River), EB (Hugli River), IGI (vol. 13, p. 171 Hooghly River)

Horton Plains
An area of montane rainforest and grassland in the Central Highlands of Sri Lanka with an average elevation of about 2100 m.
Country Sri Lanka
Province Central
Coordinates between 6° 46′ – 6° 50′ N and 80° 46′ – 80° 50′ E
Reference Survey Department, Sri Lanka, 1: 63, 360-scale map series, Nuwara Eliya sheet, revised 1976, printed 1978 (see Horton Plains – Nature reserve), Haputale sheet, revised 1940, reprinted 1967 (see Horton Plains)

Hoshungabad
Name variant Hoshangabad
Country India
State Madhya Pradesh
Coordinates 22º 45′ N 77º 43′ E
Reference USAMS U502 (NF 43-8 Hardā, shown as Hoshangābād), IPF (Hoshangabad)

Hout Bay, Cape Town
Hout Bay is the name of a coastal suburb of Cape Town
Country South Africa
Province Western Cape
Coordinates 34º 01′ S, 18º 22′ E
Reference SAG, OPN

Húghlí [Historical spelling], see Hooghly River

Hugli [Historical spelling], see Hooghly River

Humeerpore [Historical spelling], see Hamirpur

Irawadi River, see Irrawaddy River

Irawady River, see Irrawaddy River

Irrawaddy River
Name variants Ayeyarwady, Irawadi, Irawady, Irrawady
Country Burma
Coordinates 15º 57′ N, 95º 5′ E
References IGI (vol. 13, p. 367, Irrawaddy River), EB (Irrawaddy River), GM

Irrawady River, see Irrawaddy River

Iskardo [not located]
Country "Tibet"

Jabuna River [Historical spelling], see Jumna River

Jalangi River
A branch of the Ganges. It flows into the Bhagirathi River to form the Hooghly River.
Name variants Jellinghy River, Kharia
Country India
State West Bengal
Coordinates Leaves the Ganges at 24º 11′ N, 88º 43′ E and meets the Bhagirathi at 23º 25′ N, 88º 24′ E.
References EG (p. 416, Hooghly, p. 447, Jellinghy), IGI (vol. 14, p. 16, Jalangī), USAMS U502 (NF 45-3 Burdwān)

Juanpur on the River Gumti [Historical spelling]
Jaunpur was the name of a city, district and tahsil in the Banares Division of the United Provinces of British India.
Country India
State Uttar Pradesh
Coordinates Jaunpur City: 25º 45′ N, 82º 41′ E; Jaunpur District: between 25º 24′ – 26º 12′ N and 82º 07′ – 83º 05′ E; Jaunpur Tahsil: between 25º 37′ – 25º 54′ N and 82º 24′ – 82º 52′ E (in 1908)
References IGI (vol. 14, p. 8, Jaunpur District; p. 81, Jaunpur Tahsil; p. 82 Jaunpur City), FRGG; see also: http://jaunpur.nic.in/abtJaunpur.html
Reference FRGG

Jellinghy River [Historical name], see Jalangi River

Jerusalem
Country Israel
Coordinates 31º 46′ N, 35º 12′ E (Jerusalem city)

Jumna River
At around 1384 km long, the Jumna is the largest tributary of the Ganges in northern India.
Name variants Yamuna River, Jamuna River, Jabuna River
Country India
States Uttarakhand, Uttar Pradesh, Haryana
Coordinates Rises at 31º 1′ N, 78º 27′ E
References IGI (vol. 14, p. 232, Jumna), OGIS (p. 78, Jumna River), EB (Yamuna)

Kalk Bay, Cape Town
Country South Africa
Province Western Cape
Coordinates 34º 07′ S, 18º 26′ E
Reference SAG, OPN

Kaluganga
A village in Matale District that bears the name of the small river (Kalu Ganga, literally 'Black River') close to which it is located. The Kalu Ganga falls

into the Amban Ganga, a tributary of the Mahaweli Ganga (not to be confused with the Kalu Ganga of southwestern Sri Lanka, a major river that flows through Ratnapura and Kalutara Districts).
Country Sri Lanka
Province Central
Coordinates 7° 39′ N, 80° 51′ E
References Survey Department, Sri Lanka, 1: 63, 360-scale map series, Elahera sheet, revised 1955, reprinted 1967 (see Kaluganga), FRGG (Kaluganga). Benson (1860: 383) cited "Kaluganga, East Matalle district"; East Matalle district is a historical divisional name; GCPC (p. 403, Kaluganga)

Kareily Ghát near Bareilly [Historical spelling]
This likely refers to a wharf or ferry (from the Hindi 'ghat', see Bahri, 1989) on the Ramganga River near present-day Kareli, which is about 5 km southwest of the town of Bareilly.
Country India
State Uttar Pradesh
Coordinates 28° 19′ N, 79° 25′ E (Kareli)
References USAMS U502 (NH 44-13 Bareilly, shown as Karēli), IPF (Kareli)

KASHMIR [Historical name]
Until the mid-19th century, the term "Kashmir" denoted only the Kashmir Valley between the Great Himalayas and the Pir Panjal Range. Today, the term encompasses a larger area that includes the Indian-administered territories of Jammu and Kashmir and Ladakh, the Pakistani-administered territories of Azad Kashmir and Gilgit-Baltistan, and Chinese-administered territories of Aksai Chin and the Trans-Karakoram Tract.
Name variants Cashmeer, Cashmere, Cashmir
Country India
States Jammu and Kashmir
Reference IGI (vol. 15, p. 12 Kashmir and Jammu), OGIS (p. 183, Vale of Kashmir)

Kassya Hills [Historical spelling], see Khasi Hills

Kattawar [Historical spelling], see Kathiawar Peninsula

Kathiawar Peninsula
Name variants Kattiwar, Kattawar, Kathiawad, Kattywar, Saurashtra, Surashtra
Country India
State Gujarat
Coordinates Between 20º 41′ – 23º 8′ N and 68º 56′ – 72º 20′ E; the peninsula has an area of approximately 59,570 km^2
References EB (Kathiawar Peninsula), IGI (vol. 15, p. 164, Kathiawar), OGIS (p. 86, Kathiawar)

Kattiwár [Historical spelling], see Kathiawar Peninsula

Kattywar [Historical spelling], see Kathiawar Peninsula

Katukellekande, Sri Lanka (could not be located)

KEMAON [Historical name]
Formerly the most northern Division of the United Provinces of British India. It is now one of two administrative divisions of the modern Indian State of Uttarakhand. It is situated almost entirely within the Himalaya, bounded on the north by Tibet, the east by Nepal and the south by Uttar Pradesh.
Name variants Kumaon, Kumaun
Country India
State Uttarakhand
Coordinates Between 28º 51′ – 31º 5′ N and 78º 12′ – 81º 3′ E
References IGI (vol. 22, p. 378 Kumaon; vol. 16, p. 18, Kumaun), OGIS (p. 96, Kumaon)

Ken River
The Ken River is a tributary of the Yamuna River which flows through Madhya Pradesh and Uttar Pradesh, once the historical region of Bundelkhand
Name variants Cane River, Cén River, Kayan, Karnavati, the Kainas of Arrian
Country India
States Madhya Pradesh and Uttar Pradesh
Coordinates Rises at approximately 23º 54′ N, 80º 10′ E
References EIG (p. 183, Bundelcund); EB (Banda); IGI (vol. 15, p. 198 Ken)

Khasi Hills
Name variants Kasiah, Kassia, Khasia, Khasiah, Kassya, Khasya, Cassia
Country India
State Meghalaya
Coordinates Centred at 25º 15′ N, 91º 16′ E
Reference OGIS (p. 86, Kassia Mountains), IGI (vol. 15, p. 254, Khāsi and Jaintiā Hills); see also: http://meghalaya.gov.in:8080/megportal/stateprofile

Khasia Hills [Historical spelling], see Khasi Hills

Khasiah Hills [Historical spelling], see Khasi Hills

Khasya Hills [Historical spelling], see Khasi Hills

Khoonda Ghat [Historical spelling], see Kundah hills

Khoorda Ghat [Historical spelling], see Kundah hills

Kolkata
Kolkata, formerly Calcutta, is the capital of West Bengal.
Country India
State West Bengal
Coordinates 22º 30′ N, 88º 20′ E
Reference OGIS (p. 32, Calcutta city)

Kollam
Formerly Quilon
Country India
State Kerala
Coordinates 8º 53′ N, 76º 36′ E
References IGI (vol. 21, p. 21, Quilon), FRGG (Kollam), EB (Kollam)

Kottayam
Formerly Cottyam
Country India
State Kerala
Coordinates 9º 35′ N, 76º 55′ E
References USAMS U502 (NC 43-12 Rajapālaiyam), IPF (Kottayam)

KUMAON, see **KEMAON**

Kumarkhali
Country Bangladesh
Division Khulna
Coordinates 23º 52′ N, 89º 11′ E
References USAMS U502 (NF 45-4 Farīdpur), shown as Kumarkhāli. Also EIG (p. 305, Comercolly)

Kundah Hills
Name variants Khoonda Ghat, Khoorda Ghat, Koorda Ghat, Khoondah Hills, Koondah Hills
Country India
State Tamil Nadu
Coordinates 11º 11′ – 11º 15′ N and 76º 25′ – 77º 37′ E
References USAMS U502 (NC 43-3 Calicut, NC 43-4 Erode), IGI (vol. 16, p. 25, Kundahs), Bawa *et al*. (2007)

Kwadouk [Historical name], **near Thayetmyo**
Country Burma
Region ?Magway Region
Coordinates 19º 19′ N, 95º 10′ E [Thayet]
Reference Benson (1860i: 246)

Labuan
An island ceded to the British by the Sultan of Brunei in 1846, becoming a crown colony in 1848. In 1946 Labuan was incorporated into North Borneo (later Sabah).
Country Malaysia
State Sabah
Coordinates 5º 17′ N, 115º 14′ E (Victoria)
References EB (Labuan, Sabah)

Lancavi [Historical spelling], see Langkawi

Landour
Hill-station founded in 1827, contiguous with Mussoorie
Country India
State Uttarakhand
Coordinates 30º 27′ N, 78º 06′ E
Reference OGIS (p. 100, Landour town), IPF (Landour)

Langkawi
An archipelago in the Strait of Malacca, the largest island of which is the eponymous Pulau Langkawi.
Country Malaysia
State Kedah
Coordinates 6° 22' N, 99° 47' E
References GM (Pulau Langkawi), EB (Langkawi)

Lehtara jhil, near Banaras [now Varanasi]
A jhíl is a marshy lake, which may be many kilometres long during the rainy season but almost completely dry in the summer.
Reference IGI (vol. 7, p. 179, Banares)

Lítí [Historical name], see Litham

Litham
Modern-day Litham, formerly Lítí**,** occurs at an elevation of 3618 m (11,873 feet) near the Buran Pass (see Hutton, 1837: 915-917).
Country India
State Himachal Pradesh
Coordinates 31º 22′ N, 78º 06′ E
Reference USAMS U502 (NH 44-1 Chīni, Litham), FRGG (Litham)

MACAO
A special administrative region of China with an area of 30 km^2.
Name variants Macau, Aomen

Country China
Coordinates Centred on 22° 11' N, 113° 32' E
References WG (Aomen), GM (Macau), EB (Macau)

Mahabaleshwar hills
The hills in and around Mahabaleshwar town.
Country India
State Maharashtra
Coordinates 17º 56′ N, 73º 42′ E (Mahabaleshwar town)
Reference OGIS (p. 105, Mahableshwar town), IPF (Mahabaleshwar)

Mahássú [Historical spelling], see Mahasu

Mahasu
Forest in the vicinity of Mahasu, located 12.5 km east of Shimla and between Shimla and Fagu. This is the Mahasu indicated by Hutton (1837: 901-904) and referred to by Hutton and Benson (1838) in their account of the snail fauna in the Shimla area. Note that there is another place called Mahasu, which is located 35 km east of Shimla at 31º 04′ N, 77º 34′ E (see: http://hpshimla.gov.in/Shimal_Maps/pictures/4.jpg); Raheem *et al.* (2014) mistakenly identified this as the Mahasu mentioned by Hutton and Benson (1838).
Country India
State Himachal Pradesh
Coordinates 31º 06′ N, 77º 15′ N
Reference USAMS U502 (NH 43-4 Simla, shown as Mahāsu); see also Hutton and Benson (1838: 215)

Malcolm Peth, see Malcom Peth

Malcolmpeth see Malcom Peth

Malcom Peth
Country India
State Maharashtra
Coordinates 17º 55′ N, 73º 40′ E
References USAMS U502 (NE 43-10 Sātāra), Benson (1864c: 209), "Neher (Malcolmpeth)", FRGG
(Mahabaleshwar).

Matale
Country Sri Lanka
Province Central
Coordinates 7º 28′ N, 80º 37′ E
Reference FRGG (Matale)

Matelle [Historical spelling], see Matale

Mawsmai
Country India
State Meghalaya
Coordinates 25º 15′ N, 91º 45′ E
Reference USAMS U502 (NG 46-10 Shillong, shown as Mawsmai), IPF (Mawsmai)

Mehintali [Historical spelling], see Mihintale
Country Sri Lanka
Province North Central
Coordinates 8° 21′ N, 80° 31′ E
Reference FRGG (Mihintale)

Mergui [Historical name]
Most likely refers to the Mergui District of British Burma or Mergui Town (modern-day Myeik). The Mergui Archipelago, comprising over 800 islands in the Bay of Bengal between 9º and 13º N, was contained within Mergui District. There was also a Subdivision and Township of the same name.
Name variant Myeik
Country Burma
Coordinates Mergui District, between 13º 28′ – 9º 38′ N and 99º 40′ – 97º 30′ E; Mergui Town, 12º 26′ N, 98º 36′ E
Reference IGI (vol. 17, p. 293 Mergui District)

Mhow
A former British cantonment on the southern boundary of the Malwa plateau.
Name variant Mau
Country India
State Madhya Pradesh
Coordinates 22º 33′ N, 75º 46′ E
Reference IGI (vol. 17, p. 314, Mhow), FRGG (Mhow)

Midnapore
Name variant Medinipur
Country India
State West Bengal
Coordinates 22º 25′ N, 87º 20′ E
References USAMS U502 (NF 45-7 Calcutta), FRGG (Medinipur)

Mihintale
Country Sri Lanka
Province North Central
Coordinates 8° 21′ N, 80° 31′ E
Reference FRGG (Mihintale)

Mirzapoor [Historical spelling], see Mirzapur

Mirzapur
Historical names Mirzapoor, Mirzapore
Country India
State Uttar Pradesh
Coordinates 25º 09′ N, 82º 33′ E
References USAMS U502 (NG 44-12 Banāras, shown as Mirzāpur), FRGG (Mirzapur)

Moka
May refer to the district or the village of the same name.
Country Mauritius
District Moka
Coordinates Moka Village, 20º 13′ S, 57º 29′ E
Reference FRGG (Moka Village)

Monahagalla mountain(s) [Historical spelling]
This appears to be a unique spelling of a locality cited by Benson in his descriptions of *Leptopomoides orophilum* and *Pterocyclos cingalensis*. We interpret this as a possible transcription error for 'Monaragala' relating to the Monaragala (Maragalakanda) Range, the hills immediately to the east of the town of Monaragala.
Country Sri Lanka
Province Uva
Coordinates 6º 53′ N, 81º 23′ E (centred)
References Survey Department, Sri Lanka, 1: 63, 360-scale map series, Passara sheet, revised 1947, reprinted 1970 (see Monaragala and Maragalakanda); FRGG (Monaragala)

Moopana [Historical spelling], see Muppane

Moradabad
Country India
State Uttar Pradesh
Coordinates 28º 50′ N, 78º 45′ E
Reference OGIS (p. 117, Moradabad city), IPF (Moradabad)

Moulmein [Historical name]
May refer to the Moulmein Subdivision of British Burma, or the town of the same name at the mouth of the Thanlwin (Salween) River. Moulmein was the capital of Tenasserim province, ceded to the British in 1826. Its modern-day name is Mawlamyine or Mawlamyaing.
Name variants Maulmain, Mawlamyine, Mawlamyaing, Molamyaing
Country Burma
Coordinates Moulmein town, 16º 29′ N, 97º 38′ E
Reference IGI (vol. 18, p. 5, Moulmein Subdivision, p. 6 Moulmein Town)

Mount Warren, Point Danger
Country Australia
State New South Wales
Coordinates Approximately 27º 43′ S, 153º 12′ E

Muizenberg
A town on the False Bay coast
Country South Africa
Province Western Cape
Coordinates 34° 06.3′ S, 18° 28.3′ E

Mumbai
Mumbai, formerly Bombay, is the capital city of Maharashtra
Country India
State Maharashtra
Coordinates 18º 56′ N, 72º 51′ E
Reference OGIS (p. 30, Bombay city)

Muppane
Formerly Moopana
Country Sri Lanka
Province Uva
Coordinates 6º 53′ N, 81º 22′ E
Reference FRGG (Muppane)

Murshedabad [Historical spelling], see Murshidabad

Murshidabad
Country India
State West Bengal
Coordinates 24º 11′ N, 88º 16′ E
Reference USAMS U502 (NE 45-1 Berhampur, shown as Murshidābād), FRGG (Murshidabad**)**

Musmai [Historical name], see Mawsmai

Mussooree [Historical spelling], see Mussoorie

Mussoorie
Country India
State Uttarakhand
Coordinates 30º 27′ N, 78º 05′ E
References OGIS (p. 121, Mussooree town), USAMS U502 (NH 44-5 Dehra Dūn), FRGG (Mussoorie)

Muysenberg, see Muizenberg

MYSORE [Historical name]
May refer to one of two British Indian territorial divisions: the Native State of Mysore, or Mysore District (located in the southern part of Mysore

State). Mysore State now constitutes the southern part of Karnataka. There is also a *Tāluk* and city by the same name.
Coordinates Mysore State, between 11º 36′ – 15º 2′ N and 74º 38′ – 78º 36′ E, and Mysore District, between 11º 36′ – 13º 3′ N and 75º 55′ – 77º 20′ E
References IGI (vol. 18, p. 161, Mysore State, p. 250, Mysore District, p. 259, Mysore *Tāluk*, p. 260, Mysore City)

Nágkunda Forest [Historical name], see Narkanda Forest

Naini Tal Lake [Historical spelling], see Nainital Lake

Nainital Lake
A pear-shaped lake, around 3.2 km in circumference in the town of Nainital
Name variants Neini Tal, Naini Tal
Country India
State Uttarakhand
Coordinates 29° 22' N, 79° 26' E
References IGI (vol. 18, p. 333, Nainī Tāl Town), GM (Nainital)

Najibabad
May refer to Najibabad town or the tahsil of the same name.
Name variant Nujeebabad
Country India
State Uttar Pradesh
Coordinates Town at 29º 37′ N, 78º 21′ E; Tahsil, between 29º 25′ – 29º 58′ N and 78º 7′ – 78º 31′ E
Reference IGI (vol. 18, p. 334 Najībābād Tahsīl, p. 335 Najībābād Town)

Nalande
Name variant Nalanda
Country Sri Lanka
Province Central
Coordinates 7º 40′ N, 80º 38′ E
Reference FRGG (Nalanda)

Nanclai or **Nanclai Ponji** [Historical name]
Benson (1857b) described the type locality for *Diplommatina polypleuris* as "Nanclai Ponji, forty-five miles from Cherra (92º 30′ E and 25º 15′ N)". We have not been able to locate either of these place names, although the IGI (vol. 10, p. 194) referred to "Cherra" as a "Petty State in the Khasi Hills, Assam."
Name variant Possibly Nongkhlaw in the Khasi Hills
Country India
State Meghalaya?
Coordinates 25º 41′ N, 91º 38′ E
References IGI (vol. 26, Atlas 1909 edition, p. 30, map of "Eastern Bengal and Assam", shown as Nongkhlao), Oldham (1859, Nungklow), USAMS U502 (ND 46-10 Shillong, shown as Nongkhiao), FRGG (Nongkhlaw). See also http://meghalaya.gov.in:8080/megportal/district_details/14801

Nandi hills
Benson's (1864a) locality for *Helix palmaria* was the Fort Hill of Nundydroog, now part of the Nandi Hills.
Name variants Nundydroog, Nandidroog
Country India
State Karnataka
Coordinates 13º 22′ N, 77º 41′ E
References USAMS U502 (ND 44-9 Kolār), IGI (vol. 18, p. 359, Nandidroog), IPF (Nandi Hills)

Nanjing
Name variants Nanking, Nan-ching
Country China
Province Jiangsu-sheng
Coordinates 32º 3′ N, 118º 46′ E
Reference FRGG (Nanjing)

Nanking [Historical name], see Nanjing

Narbada River [Historical spelling], see Narmada River

Narkanda Forest
Formerly called the Nágkunda Forest (see Hutton, 1837: 905-906).
Country India
State Himachal Pradesh
Coordinates 31º 14′ N, 77º 28′ E
Reference USAMS U502 (NH 43-04 Simla, shown as Närkandā), IPF (Narkanda), also see http://www.hptdc.nic.in/cir0105.htm

Narmada River
Name variants Nerbudda River, Narbada River
Country India
States Madhya Pradesh, Maharashtra and Gujarat
Coordinates Centered at 22º 37′ N, 77º 32′ E; 21º 35′ N, 72º 30′ E – 22º 45′ N, 81º 30′ E
References OGIS (p. 124, Narbada or Narmada River), IGI (vol. 18, p. 375, Narabadā, vol. 18, p. 379, Narmada)

Nasmana [Historical name]
According to Blanford and Godwin-Austen (1908: 149) this is "Nasmana on the Chandrabhaga River" (the Chandrabhaga is now usually referred to as the Chenab River) in "Kashmir". This locality could not be traced.

Nauclai, see Nanclai

Neemuch
Name variant Nimach
Country India
State Madhya Pradesh
Coordinates 24º 27′ N, 74º 56′ E
Reference OGIS (p. 127, Neemuch town), IPF (Neemuch)

Neher [Historical name], see Malcolm Peth

Neini Tal Lake [Historical spelling], see Nainital Lake

Nelliyampatly, see Nelliyampathy

Nelliyampathy
A hill station in the Nelliyampathy hills.
Name variants Nellyampathy, Nelliyampathi, Nelliampathi, Nelliyampatly
Country India
State Kerala
Coordinates 10° 32' N, 76° 41' E
References GM (Nelliyampathy), IGI (vol. 19, p. 5, Nelliampathis), IPF (Nelliyampathy)

Nerbudda River [Historical name], see Narmada River

Newlands, Cape Town
Suburb of Cape Town located at the foot of Table Mountain that experiences very high winter rainfall.
Country South Africa
Province Western Cape
Coordinates 33º 58′ S, 18º 27′ E
Reference SAG, OPN

Nice
Country France
Region Provence-Alpes-Côte d'Azur
Coordinates 43º 42′ N, 7º 15′ E
Reference FRGG (Nice)

Nilgherries [Historical name], see Nilgiri Hills

Nilgiri Hills
Country India
Coordinates Centred at 11º 10′ N, 76º 37′ E
Reference OGIS (p. 129, Nilgiri Hills)

Nujeebabad [Historical spelling], see Najibabad

Nundydroog [Historical name], see Nandi Hills

ODISHA see **ORISSA**

ORISSA [Historical name]
The historical region of Orissa was the "... country in which the speakers of Oriya form the dominant people" (IGI, vol. 19, p. 249). During the late British Period, however, the name Orissa was applied to a smaller area (i.e. the greater part of the Orissa Division of Bengal Province and to the associated Orissa Tributary State). The modern state of Odisha (formerly Orissa), while including these areas is far more extensive.
Coordinates Orissa Division, between 19º 28′ – 22º 04′ N and 82º 38′ – 87º 31′ E; Orissa Tributary State, between 19º 53′ – 22º 34′ N and 83º 35′ – 87º 10′ E
Reference IGI (vol. 19, p. 248, Orissa Division, p. 252, Orissa Tributary State); see also: http://www.odisha.gov.in/portal/dist.asp

Palabaddala
Name variant Pallabadula
Country Sri Lanka
Province Sabaragamuwa
Coordinates 6° 47′ N, 80° 27′ E
Reference FRGG (Palabaddale)

Pallabadula [Historical spelling], see Palabaddala

Pankabari [Historical spelling], see Pankhabari

Pankhabari
Name variant Pankabari
Country India
State West Bengal
Coordinates 26° 49′ N, 88° 15′ E
Reference IGI (vol. 11, p. 167, Pankhābāri), GM (Pankhabari)

Paranagama
Historical name Fort McDonald
Country Sri Lanka
Province Uva
Coordinates 6º 57′ N, 80º 53′ E
References: Survey Department, Sri Lanka, 1: 63, 360-scale map series, Nuwara Eliya sheet, revised

1976, printed 1978 (see Fort McDonald and Paranagama); CG (p. 90, Fort McDonald); FRGG (Paranagama)

Patharghata Hill
Country India
State Bihar
Coordinates 25º 17′ – 25º 22′ N, 87º 12′ – 87º 16′ E
Reference IGI (vol. 20, p. 28, Patharghāta)

Pathein, see Bassein

Pegu [Historical name]
Most likely refers to Pegu District of British Burma, or to the town of Pegu (modern-day Bago).
Current name Bago
Country Burma
Coordinates Pegu District, between 16º 54′ – 18º 25′ N and 95º 57′ – 96º 54′ E, Pegu town, 17º 20′ N, 96º 29′ E
Reference IGI (vol. 20, p. 84, Pegu District, p. 96, Pegu town), FRGG (Bago)

Penang Island
Name variants Pulo/Pulau Penang, Pulo/Pulau Pinang, Prince of Wales Island
Country Malaysia
State Penang (also called Negeri Pulau Penang)
Coordinates Centred on approximately 5° 22′ N, 100° 14′ E
References GM (Pulau Penang), FRGG (Negeri Pulau Pinang)

Pentepotamia [Greek for "five rivers"], see Punjab

Perth
Sampling site was the Swan River (see below).
Country Australia
State Western Australia
Coordinates 31° 57' S, 115°514' E (approximate)

Phie Than [Historical Name]
A locality in the Tenasserim Valley (see below), which may be one of three modern localities: Pawahtein, about 65 km southeast of Myeik (Mergui); Peinchaung, approximately 40 km east of Myeik; or Pathauna, 15 km southeast of Myeik
Name variant Phye-than
Country Burma
Division Tanintharyi
Coordinates 12° 04′ N, 98° 52' E (Pawahtein), 12° 22.5′ N, 98° 59′ E (Peinchaung), 12° 21′ N, 98° 49′ E (Pathauna).
References USAMS U542 (ND 47-14 Mergui); see also Benson (1856f: 249; 1860i: 246)

Pitawela
Country Sri Lanka
Province Central
Coordinates 7º 19′ N, 80º 42′ E
Reference FRGG (Pitawela)

Pittewelle [Historical spelling], see Pitawela

Port Blair
Country India
Union Territory Andaman and Nicobar Islands
Coordinates 11° 40' N, 92° 45′ E
Reference FRGG (Port Blair)

Port Natal [Historical name], see Durban

Point Pedro
Country Sri Lanka
Province North Eastern
Coordinates: 9º 49′ N, 80º 14′ E
Reference OGIS (p. 142, Point Pedro town)

Portas Curuwitty [Historical name]
Benson (1856d: 95, 96) cited "Portas Curuwitty dictas provinciae Suffragam" and "Curuwitty Pass"
Name variants Port Curuwitty, Kuruwita
Country Sri Lanka
Province Sabaragamuwa
Coordinates 6º 46.5′ N, 80º 22′ E
References Survey Department, Sri Lanka, 1: 63, 360-scale map series, Ratnapura sheet, revised 1973, reprinted 1988 (see Kuruwita), CG (p. 143, Koorroowittia)

Prome [Historical name], see Pyay

Promontorium Bonae Spei [Latin for Cape of Good Hope], see Cape of Good Hope

Pulau Papan
A small island off Labuan
Country Malaysia
Coordinates 5° 15' 16.99" N, 115° 16' 4.01" E

Pulau Songsong
An island in the Straits of Malacca, ~37 km north of Penang Island, which is probably the one referred to as 'Pulo Susson' and 'Pulo Sung-Sung'
Country Malaysia
Coordinates 5° 48' 42.0" N, 100° 17' 45.4" E

Pulo Lancavi [Historical name], see Langkawi

Pulo Pappan [Historical name], see Pulau Papan

Pulo Pinang [Historical name], see Penang Island

Pulo Sung-Sung [Historical name], see Pulau Songsong

Pulo Susson [Historical name], see Pulau Songsong

Pune
Name variants Poona, Poonah
Country India
State Maharashtra
Coordinates 18º 32′ N, 73º 52′ E
Reference OGIS (p. 144, Pune city), FRGG (Pune)

PUNJAB [Historical name]
The name Punjab means "land of the five rivers". Etymologically this refers to the geographical area enclosed by five tributaries of the Indus River, namely the Jhelum, Chenab, Ravi, Beas and Sutlej Rivers. Alternatively Benson's use of the name may have referred to Punjab Province, which was much more extensive, enclosing an area of 346,389 km^2. This included both Native States under the control of the Punjab government and British Territory. The area now falls across the boundary between Pakistan and India. The Indian part of the Punjab consists of the states of Punjab and Haryana, the Union Territory of Chandigarh, Jammu Division of the state of Jammu and Kashmir, and parts of the National Capital Territory of Delhi, and of the states of Himachal Pradesh and Rajasthan. The Pakistani part of the Punjab comprises Punjab Province and portions of the Islamabad Capital Territory, Khyber Pakhtunkhwa Province as well as part of the self-governing state of Azad Kashmir.
Name variants Panjab, Pentepotamia
Country India and Pakistan
Coordinates Between 27º 39′ – 34º 2′ N and 69º 23′ – 79º 2′ E
Reference IGI (vol. 20, p. 245, Punjab), Schwartzberg (1992: 79, Plate IX.A.3)

Pyay
Name variants Prome, Peeage Mew, Pye, Pyit, Pyei
Country Burma
Region Bago Division
Coordinates 18° 49′ N, 95° 13′ E
References EG (p. 684, Prome), FRGG (Pyay)

Pykara
Country India
State Tamil Nadu
Coordinates 11° 27′ N, 76° 37′ E
References USAMS U502 (NC 43-4 Erode), FRGG (Pykara).

Quilon [Historical name], see Kollam

Ragama
Country Sri Lanka
Province Western
Coordinates 7° 02′ N, 79° 55′ E
Reference FRGG (Ragama).

Rajhéra river [Historical spelling]
The Rajhera River is located about 10 km northeast of Moradabad.
Country India
State Uttar Pradesh
Coordinates 28° 52.5′ N 78° 52.5′ E
Reference USAMS U502 (NH 44-13 Bareilly, shown as Rajhēra)

Rajmahal Hills
Country India
State Jharkhand
Coordinates 24º 30′ N, 86º 30′ E – 24º 40′ N, 87º 25′ E
References OGIS (p. 146, Rajmahal Hills), USAMS U502 (NG 45-11 Katihār)

Ramgunga [Historical spelling]
Benson's (1843) locality was "the wide alluvial bed of the Ramgunga, north of the station and race-course of Moradabad, in Rohilkhund". The Ramganga West River, as it is now called, is a tributary of the Ganges and has its source in the Great Himalaya of Pithoragarh District, Uttarakhand State. Moradabad is located on the banks of the Ramganga West.
Name variant Ramganga River (a tributary of the Ganges)
Country India
States Uttarakhand, Uttar Pradesh
Coordinates 30° 12′ N, 80° 07′ E [source], 28º 50′ N, 78º 45′ E [Moradabad]
Reference IGI (vol. 21, p. 175, Rāmgangā, West), USAMS U502 (NH 44-06 Nanda Devi, NH 44-13 Bareilly, shown as Rāmganga River), OGIS (p. 117, Moradabad city); see also Benson (1843: 466).

Rangoon [Historical name], see Yangon

Ratnapoora [Historical spelling], see Ratnapura

Ratnapura
Country Sri Lanka
Province Sabaragamuwa
Coordinates 6° 41′ N, 80° 25′ E
Reference OGIS (p. 149, Ratnapura city)

Reduit
Country Mauritius
District Moka
Coordinates 20° 13′ S, 57° 29′ E

Rimmau Valley [Historical name]
Valley of the Rimai Nadi, a river flowing southeast of Darjeeling town and into the Teesta (formerly Tista) River.
Country India
State West Bengal
Coordinates 26º 50′ N, 88º 30′ E
Reference USAMS U502 (Kishanganj NG-45-07, Japlaiguri NG 45-08, shown as Rimai Nadi); see also OGIS (p. 172, Teesta River)

Riversdale
Country South Africa
Province Western Cape
Coordinates 34º 05′ S, 21º 14′ E
Reference SAG, OPN

“rivulo Bangong, prope Thyet-Myo”
May refer to the Irrawaddy River or a tributary near Bangon, Thayetmo, or a small river near Bangon, west of Thayetmo
Country Burma
Region Magway Region
Coordinates 19° 19′ N, 95° 11' E (Bangon, Thayetmo), 19° 20′ N, 95° 00' E (Bangon, west of Thayetmo)
References USAMS U542 (NE 46-4 Thayetmyo), EBB (p. 770, Thayet-Myo), FRGG (Thayetmyo), GM (Thayet)

Rockville, Landour
There are several references, most notably amongst his own recollections (Benson, 1846: 463; 1859h: 266), to Benson owning an estate known as Rockville, in the hill-station at Landour, close to Mussoorie and about 15 km northeast of Dehradun. It is possible that Benson was the first owner of this property, where several new species of molluscs and beetles named by him were collected in the early 1840s.
Country India
State Uttarakhand
Coordinates 30º 27′ N, 78º 06′ E [Landour]
Reference OGIS (p. 100, Landour town)

ROHILKHAND [Historical name]
An historical region of approximately 33152 km^2, bounded to the north by the Himalaya, to the south-west by the Ganges River and to the east by the Province of Oudh (also known as Oude). The name was often applied to the Bareilly Division, but also included Rampur State and the Tarai parganas of Naini Tal District.
Name variants Rohilkhund, Rohilcund
Country India
State Uttar Pradesh
Coordinates Between 28º – 30º N and 78º – 80º E
References IGI (vol. 21, p.304, Rohilkhand), EG (p. 705, Rohilcund)

ROHILKHUND [Historical spelling], see ROHILKHAND

Rondebosch, Cape Town
Rondebosch lies between the slopes of Devil's Peak in the west and the M5 freeway in the east; it is one of the Southern Suburbs of Cape Town, which lie along the eastern slope of the Table Mountain massif. Benson’s (1850b: 216) collecting site was “at Camp Ground near Rondebosch”.
Country South Africa
Province Western Cape
Coordinates 33° 57′ S, 18° 28′ E

Roopur [Historical name]
Name variants Rupnagar, Ropar, Rupar
Country India
State Punjab
Coordinates 30º 59′ N, 76º 36′ E
Reference IOG (Rupar, p. 152), USAMS U502 (NH 43-08 Ambāla, shown as Rūpar)

Rungit valley [Historical spelling]
Valley of the Great Ranjit River and/or its tributary Ranjit River, north of Darjeeling.
Country India
State Sikkim
Coordinates 27º 17′ N, 88º 17′ E [centred]
Reference USAMS U502 (NG 45-03 Kānchenjunga, shown as the Rangīt River and Great Rangīt River)

Rungun Valley [Historical name]
Most likely the valley of the Rangnu Khola near Darjeeling. This river is a tributary of the Teesta (formerly Tista) River.

Name variant Rungnu
Country India
State Sikkim
Coordinates 27º 02′ N, 88º 22′ E [centred]
Reference USAMS U502 (NG 45-03 Kānchenjunga, shown as Rangnu Kholā); see also OGIS (p. 172, Teesta River)

Sabathu
Formerly Subathú
Country India
State Himachal Pradesh
Coordinates 30° 58′ N, 76° 59′ E
Reference FRGG (Sabathu), Hutton and Benson (1838)

Saint-Paul Island (Île Saint-Paul)
An island of the French Southern and Antarctic Lands in the southern Indian Ocean, roughly equidistant from Madagascar, Australia and Antarctica (see also Amsterdam Island).
Country France (overseas territory)
Coordinates 38° 43′ S, 77° 31′ E

Sakrigali
Name variants Sicrigali, Sikrigali
Country India
State Jharkhand
Coordinates 25º 14′ N, 87º 44′ E
Reference USAMS U502 (NG 45-11 Katihār, shown as Sakrigāli)

Salem
Country India
State Tamil Nadu
Coordinates 11º 38′ N, 78º 08′ E
Reference OGIS (p. 154, Salem city)

São Vicente, Cape Verde Islands
Name variant St Vincent
Country Republic of Caba Verde
Coordinates 16° 49′ S, 24° 58' W

SARAWAK, BORNEO
Sarawak is one of two Malaysian states on the island of Borneo. It is situated on the northwest of the island, bordering the Malaysian state of Sabah to the northeast, Indonesia to the south, and surrounding Brunei.
Country Malaysia
Coordinates 2º 33′ N, 113º 00′ E

SCINDE [Historical name], see SINDH

Sicrigali, see Sakrigali

SIND [Historical name], see SINDH

SINDE, [Historical name], see SINDH

SINDH
During the British Period, Sind was a province of India's Bombay Presidency. There was also a River Sinde.
Name variant Sind, Sinde, Scinde
Country Pakistan
Coordinates Between 23º 35′ – 28º 29′ N and 66º 40′ – 71º 10′ E
Reference IGI (vol. 22, p. 389, Sind)

SINGAPORE
The collecting site(s) of Dr John Fergusson Bacon, from whom Benson obtained specimens, could refer to the city, to the main island or possibly to one or more of the 60 smaller islands that comprise the island country in Southeast Asia.
Country Republic of Singapore
Coordinates Approximately 1° 21′ N, 103° 49′ E

Shanghai
Name variant Shang-hai
Country China
Region East China
Coordinates 31º 13′ N, 121º 28′ E
Reference FRGG (Shanghai)

Shark Bay
Name variants Shark's Bay, Sharks Bay
Country Australia
State Western Australia
Coordinates Centred approximately at 25° 30′ S, 113° 30′ E
Reference GM (Shark Bay)

Sheoay-Gheen [Historical name]
Name variant Shuay-Gheen
Modern-day Shwegyin in the Bago Region of Burma is located about 90 km northeast of Bago (formerly Pegu). During the 1870s it was the headquarters of Shwe-Gyeng District, Tenasserim Division; in 1895 part of this district was absorbed into Toungoo District (see above).
Region Bago
Country Burma
Coordinates 17° 55′ N, 96° 51′ E (Shwe-Gyeng Town)
References BBG (vol. 2, p. 642, Shwe-Gyeng Town, p. 643, Shwe-Gyeng District), IGI (vol. 23, p. 421,

see Shwegyin in Toungoo District), USAMS U542 (NE 47-9 Pegu, locality marked but name not indicated)

Shimla
Name variant Simla
Country India
State Himachal Pradesh
Coordinates 31º 07′ N, 77º 09′ E
Reference OGIS (p. 162, Simla resort), FRGG (Shimla)

Shuay-Gheen, see Sheoay-Gheen

SIKKIM
Sikkim was an independent kingdom, which became a state of India in 1975.
Country India
State Sikkim
Coordinates Centred at 27º 30′ N, 88º 30′ E
Reference OGIS (p. 162, Sikkim independent kingdom)

Sikrigali [Historical name], see Sakrigali

Simla [Historical name], see Shimla

Simon's Bay, Cape Town
Country South Africa
Province Western Cape
Coordinates 34º 11′ S, 18º 26′ E
Reference SAG, OPN

Simonstown, Cape Town
Name variant Simon's Town
Country South Africa
Province Western Cape
Coordinates 34º 11′ S, 18º 26′ E
Reference SAG, OPN

Sinchul
A locality, possibly near Darjeeling, but could not be located.

Sohra [Historical name], see Cherrapunji

Soomeysur Mountain [Historical Name]
The Someswar Range extends for about 40 km along India's boundary with Nepal. This hill range lies partly in Nepal and partly in the Indian state of Bihar (West Champaran District).
Country India and Nepal
Coordinates between 27º 22.5′ N, 84º 15′ E and 27º 19′ N, 84º 45′ E
Reference USAMS U502 (NG 45-01 Kātmāndu, shown as Someswar Range). See also IGI (vol. 8, p. 5, see entry for Bettiah Subdivision)

Sorti-Durga
Sorti-Durga, a locality mentioned by Hutton and Benson (1838: 216), is most likely modern-day Suti in West Bengal (24º 37′ N, 88º 02′ E, NG 45-15 Berhampore, Suti is probably the Sooty of EIG, 2nd edition, vol. 2: 582), which is near the point where the Bhagirathi River diverges from the Ganges.

SPITI [Historical name]
Spiti was a canton of the Kulu Subdivision of Kangra District in the British Indian political division of Punjab Province. It now forms part of the larger Lahul and Spiti District of Himachal Pradesh.
Coordinates Between 31º 42′ N – 32º 59′ N and 77º 26′ – 78º 42′ E
References IGI (vol. 23, p. 92), OGIS (p. 166, Spiti)

Spiti valley, see Spiti

SRI LANKA, see **CEYLON**

Strand, Cape Town
Often referred to as 'The Strand', which is the old name of the town, Strand is situated on the north-eastern edge of False Bay.
Country South Africa
Province Western Cape
Coordinates 34º 06′ S, 18º 49′ E
Reference SAG, OPN

Subathú [Historical spelling], see Sabathu

Sunderbans
The mangrove forest on the delta of the Ganges and Brahmaputra Rivers forms a 352 km-wide area along the Bay of Bengal. It extends from southwestern Bangladesh into the Indian state of West Bengal.
Country India
State West Bengal
Coordinates 22° 00′ N, 89° 00′ E (centred 85 km southeast of Calcutta)
Reference OGIS (Sunderbans, p. 168), IGI (vol. 23, p. 140, Sundarbans)

ST HELENA
State Dependent Territory of the United Kingdom (South Atlantic)
Coordinates 15° 57′ S, 5° 42' W

St Vincent, Cape Verde Islands, see São Vicente

Sutlej River
Name variant Satluj River (easternmost tributary of the River Indus)
Country India and Pakistan
Region Punjab
Coordinates centred at 30° 58′ N, 74° 31.3′ E
Reference OGIS (p. 169, Sutlej River)

Swan River
Country Australia
State Western Australia
Coordinates 31° 58′ S, 115° 50′ E
Reference GM

Sylhet
May refer to the town or the district of the same name. An important collection of shells in the museum of the Asiatic Society, purchased jointly by the Society and Dr J.T. Pearson in 1833 and described by Benson in 1836, came from "the area of Sylhet, Cherra Poonjee and the Khasi Hills" on what was then the North-East frontier of Bengal. Later references to this material (e.g. Pearson, 1840) refer to it as "the Sylhet collection". During the late British Period the district was located on the south-west frontier of the Indian political division of Eastern Bengal and Assam.
Name variants Silhet, Sylhat
Country Bangladesh
Coordinates Town, 24º 53′ N, 91º 52′ E; District, between 23º 59′ – 25º 13′ N and 90º 56′ – 92º 36′ E
References IGI (vol. 23, p. 189), USAMS U502 (NG 46-14 Sylhet), FRGG (Sylhet)

Table Mountain, Cape Town
Country South Africa
Province Western Cape
Coordinates 33º 57′ S, 18º 24′ E
Reference SAG, OPN

Taj Agra [Historical name]
The site of the Taj Mahal at Agra, former capital of Hindustan.
Country India
State Uttar Pradesh
Coordinates 27º 10.5′ N, 78º 2.5′ E
Reference IGI (vol. 5, p. 82, Agra City), USAMS U502 (NG 44-01 Agra, see Taj Mahal)

Tavoy [Historical name]
Most likely refers to the District or town of Tavoy in British colonial Burma.
Current name Dawei
Country Burma
Region Tanintharyi
Coordinates between 13° 16′ and 15° 06′ N and 97° 46′ and 98° 12′ E (Tavoy District), 14° 05′ N, 98° 12′ E (Tavoy Town).
Reference IGI (vol. 23, p. 258, Tavoy District, p. 266, Tavoy Town), FRGG (Dawei)

Teluk Sendur [Historical spelling], see Tilak Sindoor

Tenasserim Province/s [Historical name]
In the 1850s this region, in its broadest sense, comprised the country lying between latitudes 11° and 17° N and bounded by the coast on the west and the Tenasserim Range on the east. At this time, the term was also used in a narrower sense to refer to the "country known by the name of Tennan", lying between latitudes 8° 10′ – 13° 30′ N, most of which consisted of the British colonial Mergui District.
Country Burma
Reference GSI (p. 685, Tenasserim Provinces), IGI (vol. 17, p. 293, Mergui District)

Tenasserim River/ Valley
Strictly speaking this refers to the river formed by the junction of the Great Tenasserim and Little Tenasserim Rivers at Tenasserim (now Tanintharayi), but it has been used more loosely by some authors, such as Benson, to include the Great Tenasserim River. The Great Tenasserim (now known as the Tanintharyi River), which runs for about 300 km, is formed by two main tributaries, one arising in the Tenasserim Range to the northeast of Tavoy at about 15° 30′ N and the other in the hills between Tavoy and Mergui. The Tenasserim River has several mouths of which the two largest are located at Myeik (formerly Mergui).
Name variants Great Tenasserim River, Tanintharyi River
Country Burma
Coordinates Source, 15° 30′ N, 98° 23′ E; 12° 05′ N, 99° 01′ E (Tanintharyi); 12° 26′ N, 98° 36′ E (Myeik)
References EIG2 (vol. 2, p. 631, Tenasserim), BBG (vol. 2, p. 706, Tenasserim River), USAMS U542 (ND 47-6 Tavoy, ND 47-10 Palauk 1959 ed., ND 47-14 Mergui), USAMS L509 (ND 47-11 Thon Buri, ND 47-15 Hua Hin, NC 47-3 Prachuap Khiri Khan)

Teria Ghat [Historical spelling]
Now known as Therriaghat (see Mukhopadhyay, 2012), this place is located at the base of the southern wall of the Khasi Hills and on the northern side of the valley of the Surma River.

Name variant Terya Ghat
Country India
State Meghalaya
Coordinates 25° 10′ N, 91° 45′ E
Reference USAMS U502 (NG 46-10 Shillong, shown as Therriaghat), IGI (vol. 26, Atlas 1909 edition, p. 30, map of "Eastern Bengal and Assam", shown as Thariaghat), Oldham (1859, Teria ghat); see also IGI (vol. 15, p. 254, see Khasi and Jaintia Hills), OGIS (p. 169, Surma Valley)

Teufelberg [Latinized form of Table Mountain]

Tilak Sindoor
Formerly Teluk Sendur, a holy site near Hoshungabad
Country India
State Madhya Pradesh
Coordinates 22º 29′ N, 77º 43′ E
Reference USAMS U502 (NF 43-8 Hardā, shown as Hoshangābād), IPF (Hoshangabad)

Thayet Myo [Historical spelling], see Thayetmyo

Thayetmyo
Name variants Thyet Myo, Thyet Mio, Thayetmyo, Thayet Myo, Thayet
Country Burma
Region Magway Region
Coordinates 19° 19′ N, 95° 11′ E
References EBB (p. 770, Thayet-Myo), FRGG (Thayetmyo), GM (Thayet)

Therabuin Hill [Historical name]
Name variants Therapuin, Therapon
Historical name for Tharabwin in the valley of the Great Tenasserim (Tanintharyi) River. Theobald (1857: 250) noted that "this hill has afforded many singular forms, no where else met with".
Country Burma
Coordinates 12° 17.5′ N, 99° 2.5′ E
References USAMS L509 (ND 47-15 Hua Hin)

Thrissur [Historical spelling], see Trichur

Thyet Mio [Historical spelling], see Thayetmyo

Thyet Myo [Historical spelling], see Thayetmyo

Tolly's Nullah [Historical name]
Tolly's Nullah, now known as Adi Ganga, once contained the main flow of the Hooghly River but has now virtually dried out and has been partially obscured by a section of Kolkata Metro.

Tongou [Historical name]
Toungoo District formed part of the British colonial Tenasserim Province/Division; Toungoo (now Taungoo) Town was the headquarters of this District.
Country Burma
Region Tanintharyi
Coordinates 18° 55′ N, 96° 28' E [Toungoo Town], between17° 33′ and 19° 29′ N and 95° 48′ and 97° 13′ E [Toungoo District].
References IGI (vol. 23, p. 421, Toungoo District, p. 433, Toungoo Town), FRGG (Taungoo)

TRAVANCORE [Historical name]
The Native State of Travancore was a political division of British India. The territory it encompassed was absorbed into the modern state of Kerala.
Coordinates Between 8º 04′ – 10º 21′ N and 76º 14′ – 76º 37′ E
Reference IGI (vol. 24, p. 1, Travancore State)

Travancore Hills/Mountains [Historical name]
The Western Ghats of the British Indian State of Travancore.
Name variants Travencore Hills
Coordinates Travancore State, between 8º 04′ – 10º 21′ N and 76º 14′ – 76º 37′ E
Reference IGI (vol. 24, p. 1, Travancore State)

Tribeni Ghat
Name variant Triveni Ghat
Country India
State West Bengal, Hooghly District
Coordinates 22° 99' N, 88° 40' E [Tribeni]

Trichoor [Historical spelling], see Trichur

Trichur
Country India
State Kerala
Coordinates 10º 32′ N, 76º 14′ E
Reference OGIS (p. 179, Trichoor /Trichur City), FRGG (Thrissur)

Trincomalee
Country Sri Lanka
Province Eastern
Coordinates 8° 35′ N, 81° 11′ E

Uitenhage
Country South Africa
Province Eastern Cape
Coordinates 33º 45′ S, 25º 23′ E
Reference SAG, OPN

Vanua Balavu
Country Fiji (Lau archipelago)
Coordinates 17º 13′ S, 178º 57′ W

Varansi
Historical/Name variants Banaras, Banares, Kasi, Varanassi
Country India
State Uttar Pradesh
Coordinates 25º 19′ N, 83º 0′ E
References IGI (vol. 7, p. 179, Banares District), FRGG (Varanasi)

Wadalé [Historical name]
Refers to the town (modern name Vadala Bhairoba) located 26 miles northeast of Ahmadnagar, where the evangelist and naturalist S.B. Fairbank was based in the second half of the 19th century (Trafton, 2005).
Country India
State Maharashtra
Co-ordinates 19º 26′ N, 74º 54′ E
Reference FRGG (Vadala Bhairoba), USAMS U502 (NE 43-2 Ahmadnagar).

Waterloo
Benson's (1856c) locality is Waterloo Bay, Caffraria**,** east of the mouth of the Great Fish River.
Country South Africa
State Eastern Cape
Coordinates 33º 29′ S, 27º 08′ E

Weelgamoowe [Historical spelling], see Wilgomuwa

Wilgomuwa
Country Sri Lanka
Province Central
Coordinates 7° 31′ N, 80° 56′ E
References FRGG (Wilgomuwa)

Yangon
Formerly Rangoon, the former capital of Burma
Country Burma
Region Yangon
Coordinates 16° 48′ N, 96° 09′ E
Reference IGI (vol. 21, p. 213, Rangoon City), FRGG (Yangon)

Yunglaw
A site in the Tenasserim valley (see above), which could not be traced.

Zhoushan, see Chusan [Historical spelling]
The current transliteration is of Chusan is "Zhoushan", which may refer to the city, island or archipelago of the same name. The archipelago is one of the largest in China and comprises more than 400 islands.
Country China
Province Zhejiang Sheng
Coordinates Zhoushan city, 30º 1′ N, 122º 5′ E
References EB (Zhoushan), FBB

APPENDIX 3. Geographical Occurrence of Taxa Described by W.H. Benson

Taxa described by W.H. Benson are here listed according to the country or region in which their type localities are located. Modern political boundaries are used but in a few cases there is uncertainty about the precise location of collecting localities and the country concerned. A particular problem relates to the species that Benson described from the Asiatic Society's collection "chiefly made in the hills on the N.E. Frontier of Bengal" (Benson, 1836a, b). The locality given for some of these species is Silhet (Sylhet), which is now in Bangladesh. However, in most cases the locality data is too imprecise to be certain as to whether the specimens were collected in Bangladesh or India. For this reason we exclude Bangladesh from our geographical breakdown, although it is likely that some species originated from there. Benson taxa are listed systematically for each region, using current taxonomic nomenclature. The list includes taxa here considered *nomina dubia* and refers taxa to the countries mentioned by Benson, even though a few of these attributions are highly dubious (e.g. *Cerion regium* from China). For taxa now regarded as synonyms, the provisionally accepted name is given first, followed by Benson's original name(s) in bold.

ANDAMAN ISLANDS

Pleuropoma andamanica (Benson, 1860)
Pleuropoma scrupula (Benson, 1863)
Jerdonia tignarium (Benson, 1863)
Chamalycaeus andamaniae (Benson, 1861)
Omphalotropis distermina Benson, 1863
Videna sanis (Benson, 1861)
Rhyssotopsis conferta (L. Pfeiffer, 1857)
=***Helix haughtoni* Benson, 1863**
Tanychlamys aulopis (Benson, 1863)
Tanychlamys choinix (Benson, 1861)
Tanychlamys stephus (Benson, 1861)
Chloritis (*Trichloritis*) *helferi* (Benson, 1860)
Chloritis (*Trichloritis*) *hemiopta* (Benson, 1863)
Trachia trochalia (Benson, 1861)
Prosopeas haughtoni (Benson, 1863)
Prosopeas haughtoni oxynter (Benson, 1863)
Prosopeas walkeri (Benson, 1863)
Haploptychius andamanicus (Benson, 1860)

AUSTRALIA

Circulus liricinctus (Benson, 1853)
Circulus orbiculatus (Benson, 1853)
Velepalaina strangei (L. Pfeiffer, 1854)
=***Diplommatina australiae* Benson, 1855**
Stenothyra frustillum Benson, 1856
Bothriembryon bulla (Menke, 1843)
=***Bulimus baconi* Benson, 1854**
Luinodiscus cygnea (Benson, 1853)
Luinodiscus sublesta (Benson, 1853)
Plectorhagada plectilis (Benson, 1853)
Rhagada torulus (Férussac, 1819)
=***Helix tescorum* Benson, 1853**

BORNEO

Lagocheilus trilirata quadrifilosa (Benson, 1852)
Coptocheilus anostomus (Benson, 1852)
Stenothyra strigilata Benson, 1856
Dyakia regalis (Benson, 1850)

BURMA

Georissa frustrillum (Benson, 1860)
Georissa illex (Benson, 1856)
Georissa pyxis (Benson, 1856)
Georissa rawesiana (Benson, 1860)
Cyclophorus (*Cyclophorus*) *scurra* Benson, 1857
Cyclophorus (*Glossostylus*) *cryptomphalus* B., 1857
Cyclophorus (*Cyclophorus*) *balteatus* Benson, 1857
Cyclophorus (*Cyclophorus*) *flavilabris* Benson, 1860
Cyclophorus (*Cyclophorus*) *theobaldianus* B., 1857
Lagocheilus scissimargo (Benson, 1856)
Leptopoma (*Trocholeptopoma*) *aspirans* (B., 1856)
Scabrina calyx (Benson, 1856)
Cyclotus (*Siphonocyclus*) *gordoni* (Benson, 1863)
Pterocyclos cetra Benson, 1856
Pterocyclos pullatus Benson, 1856
Rhiostoma housei Haines, 1855
=***Rhiostoma haughtoni* Benson, 1860**
Alycaeus pyramidalis Benson, 1856
Dicharax (?) *umbonalis* (Benson, 1856)
Chamalycaeus sculptilis (Benson, 1856)
Chamalycaeus (?) *armillatus* (Benson, 1856)
Dioryx amphora (Benson, 1856)
Tylotoechus artatus (Benson, 1856)
Tylotoechus arulus (Benson, 1856)
Tylotoechus peguensis (Benson, 1860)
Pollicaria gravida (Benson, 1856)
=***Otopoma blennus* Benson, 1856**
Paludomus (*Paludomus*) *ornatus* Benson, 1856
Paludomus (*Paludomus*) *petrosus* (Gould, 1844)
=***Paludomus labiosa* Benson, 1856**
Paludomus (*Paludomus*) *regulata* Benson, 1856
Stenothyra monilifera Benson, 1856
Gastrocopta avanica (Benson, 1863)
Hypselostoma tubiferum (Benson, 1856)
Clostophis sankeyi Benson, 1860
Oospira (*Oospira*) *bulbus* (Benson, 1863)
Plectopylis cyclaspis (Benson, 1859)
=***Helix catinus* Benson, 1859**
Chersaecia brachyplecta (Benson, 1863)

BURMA continued
Chersaecia dextrorsa (Benson, 1860)
Chersaecia leiophis (Benson, 1860)
Glyptaulax artificiosa (Benson, 1856)
Trochomorpha ceryx (Benson, 1859)
Sesara infrendens (Gould, 1844)
=***Helix capessens* Benson, 1856**
Sesara pylaica (Benson, 1856)
Durgella levicula (Benson, 1859)
Sitala arx (Benson, 1859)
Sitala attegia (Benson, 1859)
Sophina calias (Benson, 1859)
Sophina forabilis (Benson, 1859)
Sophina schistostelis (Benson, 1859)
Hemiplecta? gordoniae (Benson, 1863)
Hemiplecta ? *textrina* (Benson, 1856)
Burmochlamys cassidula (Benson, 1859)
Burmochlamys cauisa (Benson, 1859)
Burmochlamys perpaula (Benson, 1859)
Tanychlamys ? *aspides* (Benson, 1863)
Tanychlamys molecula (Benson, 1859)
Tanychlamys pauxillula (Benson, 1859)
Tanychlamys ? *petasus* (Benson, 1859)
Khasiella ? *pansa* (Benson, 1856)
Sarika birmana (L. Pfeiffer, 1857)
=***Helix acerra* Benson, 1859**
Sarika consepta (Benson, 1860)
Taphrospira convallata (Benson, 1856)
Bradybaena bolus (Benson, 1856)
Bradybaena peguensis (Benson, 1860)
Bradybaena pilidion (Benson, 1860)
Bradybaena scalpturita (Benson, 1859)
Aegista oldhami (Benson, 1859)
Amphidromus moniliferus (Gould, 1846)
=***Bulimus theobaldianus* Benson, 1857**
Camaena ochthoplax (Benson, 1860)
Chloritis bifoveata (Benson, 1856)
Ganesella hariola (Benson, 1856)
Ganesella scenoma (Benson, 1863)
Ganesella scenoma depressa (Benson, 1863)
Trachia fritillata (Benson, 1863)
Curvella puta (Benson, 1857)
Carinartemis sankeyi (Benson, 1859)
Haploptychius bombax (Benson, 1859)
Scaphula pinna Benson, 1856
Indochinella pugio pugio (Benson, 1862)
Radiatula crispisulcata (Benson, 1862)

CAPE VERDE ISLANDS
Pupoides (*Pupoides*) *gemmula* (Benson, 1856)
Gastrocopta acarus (Benson, 1856)
Cecilioides cf. *acicula* (Müller, 1774)
=***Achatina spiculum* Benson, 1856**

MAINLAND CHINA
Oxyloma orientalis (Benson, 1851)
Cerion (*Strophiops*) *regium* (Benson, 1849); locality highly unlikely
Gastrocopta thibetica (Benson, 1864)
Amphidromus sinensis (Benson, 1851)
Tortaxis erectus (Benson, 1842)

FRANCE
Truncatellina callicratis (Scacchi, 1833)
=***Pupa rivierana* Benson, 1854**

INDIA
Georissa sarrita (Benson, 1851)
Vittina smithii Wood, 1828
=***Neritina tigrina* Benson, 1836**
Neripteron cornucopia (Benson, 1836)
Neripteron violaceum (Gmelin, 1791)
=***Neritina depressa* Benson, 1836**
Septaria tesselata (Lamarck, 1816)
=***Navicella compressa* Benson, 1836**
Cyclophorus (*Kobeltostylus*) *involvulus* (Müller, 1774)
=***Cyclostoma involvulus* Benson, 1836**
Cyclophorus (*Kobeltostylus*) *jerdoni* (Benson, 1851)
Cyclophorus (*Kobeltostylus*) *nilagiricus* (B., 1852)
Cyclophorus (*Kobeltostylus*) *pyrotrema* B., 1854
Cyclophorus (*Glossostylus*) *altivagus* Benson, 1854
Cyclophorus (*Glossostylus*) *aurora* (Benson, 1851)
Cyclophorus (*Glossostylus*) *cybeus* (Benson, 1857)
Cyclophorus (*Glossostylus*) *himalayanus* L. Pfr., 1851
=***Cyclophorus exul* Benson, 1854**
Cyclophorus (*Glossostylus*) *pearsoni* (Benson, 1851)
Cyclophorus (*Glossostylus*) *tryblium* Benson, 1854
Cyclophorus (*Cyclophorus*) *porphyriticus* **(**B., 1851)
Cyclophorus (*Cyclophorus*) *zebrinus* (Benson, 1836)
Craspedotropis cuspidata (Benson, 1851)
Lagocheilus tomotrema (Benson, 1857)
Micraulax coeloconus (Benson, 1851)
Scabrina phaenotopica (Benson, 1851)
Scabrina pinnulifera (Benson, 1857)
Theobaldius ravidus (Benson, 1851)
Cyathopoma filocinctum (Benson, 1851)
Jerdonia trochlea (Benson, 1851)
Pterocyclos bilabiatus Benson, 1835
Pterocyclos nanus Benson, 1851
Pterocyclos rupestris Benson, 1832
Dicharax (?) *gemmula* (Benson, 1859)
Dicharax hebes (Benson, 1857)
Dicharax (?) *plectocheilus* (Benson, 1859)
Metalycaeus crenulatus (Benson, 1859)
Metalycaeus physis Benson, 1859
Metalycaeus prosectus (Benson, 1857)
Metalycaeus stylifer (Benson, 1857)
Pincerna bembex (Benson, 1859)

INDIA continued

Pincerna constricta (Benson, 1851),
Pincerna constricta minor (Benson, 1859)
Pincerna otiphorus (Benson, 1859)
Dioryx urnula (Benson, 1853)
Diplommatina (*Diplommatina*) *blanfordiana* B., 1860
Diplommatina (*Diplommatina*) *costulata* B., 1849
Diplommatina (*Diplommatina*) *diplocheilus* B., 1857
Diplommatina (*Diplommatina*) *pachycheilus* B., 1857
Diplommatina (*Diplommatina*) *polypleuris* B., 1857
Diplommatina (*Diplommatina*) *pullula* B., 1859
Tylotoechus imbriciferus (Benson, 1856)
Pseudopomatias himalayae (Benson, 1859)
Pseudopomatias pleurophorus (Benson, 1857)
Streptaulus blanfordi Benson, 1857
=***Helix calpis* Benson, 1859**
Coptocheilus funiculalus (Benson, 1838)
Bellamya bengalensis balteata (Benson, 1836)
Angulyagra oxytropis (Benson, 1836);
[type locality not specified]
Cipangopaludina lecythis (Benson, 1836)
Mekongia crassa (Benson, 1836)
Brotia costula (Rafinesque, 1833)
=***Melania variabilis* Benson, 1836**
Brotia (?) *zonata* (Benson, 1836)
Paludomus (*Paludomus*) *stephanus* (Benson, 1836)
Paludomus (*Odontochasma*) *stomatodon* (B., 1862)
Tarebia lineata (Gray, 1828)
=***Melania lirata* Benson, 1836**
Mieniplotia scabra (Müller, 1774)
=***Melania elegans* Benson, 1836**
Brotia sp.
=***Melania terebra* Benson, 1836**
Melanoides tuberculata (O.F. Müller, 1774)
=***Melania pyramis* Benson, 1830**
Cyclotopsis subdiscoidea (Sowerby, 1850)
=***Cyclostoma aratum* Benson, 1851**
Macrassiminea francesiae (Wood, 1828)
=***Assiminea fasciata* Benson, 1835**
Acmella tersa (Benson, 1853)
Gabbia travancorica (Benson, 1860)
Digoniostoma cerameopoma (Benson, 1830)
Digoniostoma pulchella (Benson, 1836)
Tricula montana Benson, 1843
Stenothyra deltae (Benson, 1837)
Stenothyra foveolata Benson, 1856
Nassodonta annesleyi (Benson, 1860)
Camptonyx theobaldi Benson, 1858
Lymnaea (*Pseudosuccinea*) *acuminata chlamys* B, 1836
Gyraulus labiatus (Benson, 1850)
Gyraulus rotula (Benson, 1850)
Ferrissia verruca (Benson, 1855)
Hippeutis (*Helicorbis*) *umbilicalis umbilicalis* (B, 1836)
=***Planorbis caenosus* Benson, 1850**
Hippeutis (*Helicorbis*) *umbilicalis cantori* (B., 1850)
Segmentina calatha (Benson, 1850)
Segmentina trochoidea (Benson, 1836)
Indoplanorbis exustus (Deshayes, 1834)
=***Planorbis indicus* Benson, 1836**
Camptoceras terebra Benson, 1843
Carychium indicum Benson, 1849
=***Carychium boysianum* Benson, 1864**
Coilostele scalaris Benson, 1864
Pythia plicata (Férussac, 1821)
=***Scarabus triangularis* Benson, 1836**
Vertigo diopsis (Benson, 1863)
Vertigo seriola (Benson, 1863)
Pyramidula humilis (Benson, 1838)
Pupisoma dioscoricola (C.B. Adams, 1845)
=***Helix orcula* Benson, 1850**
Truncatellina himalayana (Benson, 1863)
Gastrocopta bathyodon (Benson, 1863)
Gastrocopta huttoniana (Benson, 1849)
Gastrocopta serrula (Benson, 1863)
Angustopila milium (Benson, 1853)
Bensonella plicidens (Benson, 1849)
Insulipupa brevicostis (Benson, 1849)
Pupilla gutta (Benson, 1864)
Mirus smithei (Benson, 1865)
Pseudonapaeus domina (Benson, 1857)
Pseudonapaeus salsicola (Benson, 1857)
Cylindrophaedusa (*Montiphaedusa*) *ios ios* (B., 1852)
Oospira (*Oospira*) *loxostoma* (Benson, 1836)
Endothyrella pinacis (Benson, 1859)
Endothyrella plectostoma (Benson, 1836)
Corilla anax (Benson, 1865)
Thysanota crinigera (Benson, 1850)
Philalanka bidenticulata (Benson, 1852)
Kaliella bullula (Benson, 1838)
Kaliella nana (Benson, 1838)
Rahula bascauda (Benson, 1859)
Rahula corys (Benson, 1859)
Rahula macropleuris (Benson, 1859)
Sivella castra (Benson, 1852)
Sesara ? *diplodon* (Benson, 1859)
Durgella salius (Benson, 1859)
Durgella ? *seposita* (Benson, 1859)
Sitala turbiniformis (Benson, 1838)
Sitala palmaria (Benson, 1864)
Sitala rimicola (Benson, 1859)
Ariophanta basilessa (Benson, 1865)
Ariophanta basileus (Benson, 1861)
Ariophanta cysis (Benson, 1852)
Ariophanta interrupta (Benson, 1834)
Ariophanta laidlayana (Benson, 1856)
Ariophanta solata (Benson, 1848)
Ariophanta thyreus (Benson, 1852)
Austenia gigas (Benson, 1836)

INDIA continued

Cryptaustenia succina (Reeve, 1862)
=***Vitrina planospira* Benson, 1859**
Indrella ampulla (Benson, 1850)
Euplecta acuducta (Benson, 1850)
Euplecta ? *baconi* (Benson, 1850)
Euplecta cacuminifera (Benson, 1850)
Euplecta travancorica (Benson, 1865)
Tanychlamys decussata (Benson, 1836)
Tanychlamys hodgsoni (Benson, 1859)
Tanychlamys vesicula (Benson, 1838)
=***Helix lecythis* Benson, 1852**
Tanychlamys lubrica (Benson, 1852)
Tanychlamys ? *neherensis* (Benson, 1864)
Tanychlamys patane (Benson, 1859)
Tanychlamys pedina (Benson, 1865)
Tanychlamys planiuscula (Benson, 1838)
Tanychlamys rorida (Benson, 1859)
Tanychlamys sequax (Benson, 1859)
Tanychlamys subjecta (Benson, 1852)
Tanychlamys tugurium (Benson, 1852)
Euaustenia cassida (Benson, 1838)
Euaustenia monticola (L. Pfeiffer, 1849)
=***Vitrina scutella* Benson, 1859**
Bensonies camura (Benson, 1859)
Bensonies monticola (Benson, 1838)
Khasiella ? *chloroplax* (Benson, 1865)
Khasiella climacterica (Benson, 1836)
Khasiella climacterica nana (Benson, 1859)
Khasiella hyba (Benson, 1861)
Khasiella ornatissima (Benson, 1859)
Khasiella serrula (Benson, 1836)
Oxytesta cycloplax (Benson, 1852)
Oxytesta orobia (Benson, 1848)
Oxytesta oxytes (Benson, 1836)
Syama splendens (Benson, 1838)
Bradybaena cestus (Benson, 1836)
Bradybaena radicicola (Benson, 1848)
Aegista tapeina (Benson, 1836)
Beddomea physalis (Benson, 1857)
Bouchetcamaena delibrata (Benson, 1836)
Ganesella acris (Benson, 1859)
Ganesella capitium (Benson, 1848)
Ganesella galea (Benson, 1859)
Landouria huttonii (L. Pfeiffer, 1842)
=***Helix orbicula* Benson, 1838**
Trachia contracta (Benson, 1864)
Trachia crassicostata (Benson, 1848)
Glessula arthuri (Benson, 1864)
Glessula botellus (Benson, 1860)
Glessula chessoni (Benson, 1860)
Glessula crassilabris (Benson, 1836)
Glessula facula (Benson, 1860)
Glessula fairbanki (Benson, 1865)
Glessula leptospira (Benson, 1865)
Glessula notigena (Benson, 1860)
Glessula orobia (Benson, 1860)
Glessula praelustris (Benson, 1860)
Glessula pyramis (Benson, 1860)
Glessula sarissa (Benson, 1860)
Glessula scrutillus (Benson, 1860)
Glessula vadalica (Benson, 1865)
Rishetia hastula (Benson, 1860)
Rishetia tenuispira (Benson, 1836)
Perrottetia theobaldi (Benson, 1859)
Pupennea planguncula (Benson, 1863)
Sinoennea stenopylis (Benson, 1860)
Sinoennea vara (Benson, 1859)
Arcuatula variegata (Benson, 1855)
Scaphula celox Benson, 1836
Balwantia soleniformis (Benson, 1836)
Lamellidens corrianus (Lea, 1834)
=***Unio theca* Benson, 1835**
Lamellidens jenkinsianus (Benson, 1862)
Parreysia corrugata (O.F. Müller, 1774)
=***Unio favidens* Benson, 1862**
=***Unio favidens* var. *chrysis* Benson, 1862**
=***Unio favidens* var. *deltae* Benson, 1862**
=***Unio favidens* var. *densa* Benson, 1862**
=***Unio favidens* var. *marcens* Benson, 1862**
=***Unio favidens* var. *trigona* Benson, 1862**
=***Unio favidens* var. *viridula* Benson, 1862**
=***Unio laevirostris* Benson, 1862**
=***Unio smaragdites* Benson, 1862**
Parreysia nagpoorensis (Lea, 1860)
=***Unio pinax* Benson, 1862**
=***Unio triembolus* Benson, 1855**
Parreysia plagiosoma (Benson, 1862)
Indonaia bonneaudii (Eydoux, 1838)
=***Unio leioma* Benson, 1862**
Indonaia gratiosa (Philippi, 1843)
=***Unio macilentus* Benson, 1862**
Indonaia caerulea (Lea, 1831)
=***Unio pachysoma* Benson, 1862**
Villorita cyprinoides cochinensis (Hanley, 1859)
=***Corbicula quilonica* Benson, 1860**
Novaculina gangetica Benson, 1830
Tanysiphon rivalis Benson, 1858

INDIAN OCEAN

Oxygyrus inflatus Benson, 1835
Carinaria cithara Benson, 1835
Carinaria galea Benson, 1835
Clio recurva (Children, 1823)
=***Balantium bicarinatum* Benson, 1837**
Cuvierina urceolaris (Mörch, 1850)
=***Cuvierina oryza* Benson, 1836**,
nomen oblitum

ATLANTIC OCEAN
Diacavolinia limbata (d'Orbigny, 1836)
?= ***Hyalaea fissilabris*** Benson, 1861

ISRAEL
Turanena (*Turanena*) *benjamitica* (Benson, 1859)

LIBERIA
Gulella ofella (Benson, 1864)

MALAYSIA
Clausilia stylus Benson, 1849
Cyclophorus (*Cyclophorus*) *cantori* (Benson, 1851)
Cyclophorus (*Cyclophorus*) *malayanus* (Benson, 1852)
Pterocyclos blandi Benson, 1851
Stenothyra cingulata Benson, 1856
Videna cantoriana (Benson, 1861)

MAURITIUS
Omphalotropis plicosa (L. Pfeiffer, 1852)
=***Omphalotropis harpula*** **Benson, 1859**
Elasmias cernicum (Benson, 1850)
Rhachistia sanguineus (Benson, 1857)
Rhachistia vesiculatus (Benson, 1859)
Louisia barclayi (Benson, 1850)
Erepta odontina (Morelet, 1851)
=***Helix suffulta*** **Benson, 1853**
Erepta stylodon (L. Pfeiffer, 1842)
=***Helix albidens*** **Benson, 1853**
Erepta setiliris (Benson, 1859)
Ctenophila caldwelli (Benson, 1859)

NEPAL
Pupilla (*Pupilla*) *eurina* (Benson, 1864)
Chloritis cyclotrema (Benson, 1863)

PAKISTAN
Segmentina sindicus Benson, 1850
Zootecus estellus (Benson, 1857)
Zootecus insularis (Ehrenberg, 1831)
=***Bulimus pertica*** **Benson, 1857**

SINGAPORE
Geotrochus lychnia (Benson, 1852)

SOUTH AFRICA
Hydrocena noticola Benson, 1856
Chondrocyclus convexiusculus minor (Benson, 1856)
Maizania wahlbergi (Benson, 1852)
Lauria dadion (Benson, 1864)
Tomigerella fryanus (Benson, 1864)
Tomigerella layardi (Benson, 1856)
Tomigerella layardi minor (Benson, 1864)
Fauxulella pamphorodon (Benson, 1864)
Gittenedouardia arenicola (Benson, 1856)
Trachycystis bisculpta (Benson, 1851)
Trachycystis tollini (Benson, 1856)
Cyclocystis charybdis (Benson, 1856)
Cyclocystis vorticialis (Benson, 1850)
Lyrocystis cosmia (L. Pfeiffer, 1852)
=***Helix munda*** **Benson, 1850** (non Adams, 1849)
=***Helix omphalion*** **Benson, 1864**
Lyrocystis perplicata (Benson, 1851)
Lyrocystis prionacis (Benson, 1864)
=***Helix browningii*** **Benson, 1864**
Phaulocystis petrobia (Benson, 1851)
Trachycystis sabuletorum (Benson, 1851)
Xerocystis capensis paludicola (Benson, 1850)
Microkerkus arnotti (Benson, 1864)
Sheldonia capsula (Benson, 1864)
Sheldonia cotyledonis (Benson, 1850)
Sheldonia hudsoniae (Benson, 1864)
Sheldonia phytostylus (Benson, 1864)
Sheldonia trotteriana (Benson, 1848)
Nata dumeticola (Benson, 1851)

SRI LANKA
Leptopoma (*Trocholeptopoma*) *apicatum* Benson, 1856
Leptopomoides halophilus (Benson, 1851)
Leptopomoides orophilus (Benson, 1853)
Theobaldius cadiscus (Benson, 1860)
Theobaldius cratera (Benson, 1856)
Theobaldius cytopoma (Benson, 1860)
Theobaldius parapsis (Benson, 1853)
Theobaldius parma (Benson, 1856)
Pterocyclos cingalensis Benson, 1853
Pterocyclos troscheli Benson, 1851
Tortulosa (*Eucataulus*) *austeniana* (Benson, 1853)
Tortulosa (*Eucataulus*) *decora* (Benson, 1853)
Digoniaxis cingalensis (Benson, 1863)
Gyraulus hyptiocyclos (Benson, 1863)
Ancylus ceylanicus Benson, 1864
Microstele muscerda (Benson, 1853)
Pupisoma miccyla (Benson, 1860)
Gastrocopta mimula (Benson, 1853)
Mirus panos (Benson, 1853)
Mirus stalix (Benson, 1863)
Phaedusa (*Phaedusa*) *ceylanica* (Benson, 1863)
Corilla odontophora (Benson, 1865)
Ruthvenia clathratula (L. Pfeiffer, 1850)
=***Helix puteolus*** **Benson, 1853**
Philalanka mononema (Benson, 1853)
Sivella galerus (Benson, 1856)
Eurychlamys regulata (Benson, 1860)
Eurychlamys vilipensa (Benson, 1853)
Sitala phyllophila (Benson, 1863)
Satiella membranacea (Benson, 1853)
Ariophanta ceraria (Benson, 1853)

SRI LANKA continued
Ariophanta bistrialis (Beck, 1837)
=***Helix cyix* Benson, 1860**
Euplecta semidecussata (L. Pfeiffer, 1853)
=***Helix cingalensis* Benson, 1860**
Euplecta partita (L. Pfeiffer, 1853)
=***Helix marcida* Benson, 1853**
Euplecta semidecussata (L. Pfeiffer, 1853)
=***Helix rosamonda* Benson, 1860**
Tanychlamys perfucata (Benson, 1853)
Ratnadvipia edgariana (Benson, 1853)
Beddomea trifasciata (Gmelin, 1790)
=***Bulimus fuscoventris* Benson, 1856**
=***Beddomea trifasciatus rufopicta* (Benson, 1856)**
Eutomopeas layardi (Benson, 1863)
Glessula pachycheila (Benson, 1853)
Glessula panaetha (Benson, 1860)
Glessula parabilis (Benson, 1856)
Glessula serena (Benson, 1860)
Glessula veruina (Benson, 1853)
Indoartemon cingalensis (Benson, 1853)
Indoartemon layardianus (Benson, 1853)

St HELENA
Helisiga santaehelenae (Lesson, 1830)
=***Succinea imperialis* Benson, 1851**
Oxychilus (*Ortizius*) *alliarius* (Miller, 1822)
=***Helix remota* Benson, 1851**
Cecilioides acicula (Müller, 1774)
=***Achatina veru* Benson, 1856**
Chilonopsis helena (Quoy & Gaimard, 1833)
=***Bulimus relegatus* Benson, 1851**
Opeas hannense (Rang)
=***Bulimus compressilabris* Benson, 1856**

ZHOUSHAN ("CHUSAN")
Cipangopaludina lecythoides (Benson, 1842)
Laguncula pulchella Benson, 1842
Sinotaia quadrata quadrata (Benson, 1842)
Semisulcospira cancellata (Benson, 1842)
?=***Melania crebricostis* Benson, 1842**
Gabbia longicornis (Benson, 1842)
Parafossarulus manchouricus (Bourguignat, 1861)
=***Paludina* (*Bithynia*) *striatula* Benson, 1842**
Bullacta caurina (Benson, 1842)
Austropeplea viridis (Quoy & Gaimard, 1832)
?=***Lymnaea minor* Benson, 1842**
Radix auricularia (Linnaeus, 1758)
=***Lymnaea plicatula* Benson, 1842**
Polypylis hemisphaerula (Benson, 1842)
Polypylis papyraceus (Benson, 1842)
Euphaedusa (*Euphaedusa*) *aculus aculus* (B., 1842)
Hemiphaedusa (*Hemiphaedusa*) *pluviatilis pluviatilis* (Benson, 1842)
Quantula striata (Gray, 1834)
=***Helix naninoides* Benson, 1842**
Meghimatium bilineatum (Benson, 1842)
Acusta ravida (Benson, 1842)
Mytilisepta virgata (Weigmann, 1837)
=***Dreissena purpurascens* Benson, 1842**
Mytilus niger Benson, 1842
Arcuatula senhousia (Benson, 1842)
Estellacar galactodes (Benson, 1842)
Sinanodonta woodiana (Lea, 1834)
=***Anodon gibbum* Benson, 1842**
Lamprotula divergens (Benson, 1842)
Corbicula fluminalis (Müller, 1774)
=***Corbicula fuscata* Benson, 1842**
Iridona iridescens (Benson, 1842)

INDEX

PEOPLE AND INSTITUTIONS

A

Agar, Jane 3
Albers, Dr Johann Christian **10**, 138
Alexander, Major **10**, 189
Annandale, T. Nelson 32, 36
Arnot, David **10**, 34, 45
Asiatic Society of Bengal 2, 15, 19, 31, 32, 34, 35, 46, 53, 60
Atkinson, E. 149
Auckland, Lord 19
Austen (later Godwin-Austen), Robert Alfred Cloyne 22
Austrian Geological Survey 27

B

Bacon, Dr John Fergusson **10**, 14, 17, 18, 91, 106, 109, 114, 117, 142, 147, 159, 164, 179, 187, 191, 194, 209, 236
Bailie, Edward 3
Baker, William Erskine **10**, 15
Barclay, Sir David W. 4, 5, **10**, 40
Beche, Henry de la 22
Beddome, Richard Henry 28
Bengal Medical Service 15, 17, 18, 19, 114
Benson, Arthur Edward 4, 30, 31
Charles Annesley 4, 8, **10**, 30, 32, 106, 109, 170, 175, 223
Sophia Mary 4, 9, 10, **10**, 30, 31, 32, 33
William Henry 2, **3**, **6**, **10**, **12**, 29, 32, 33, **35**, **249**, **352**
Bingham, Charles T. 26
Bland, Thomas B. 34
Bland, Dr William **10**, 17, 75, 77
Blanford, Henry Francis **11**, 22, 28, 31, 32, 33, 44–45, 82, 85, 86, 90, 137, 186
Blanford, William Thomas **11**, 16, 22, 25, 27, 28, 32, 45, 61, 65, 70, 72, 76, 78, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 98, 106, 107, 123, 127, 129, 134, 136, 137, 153, 167, 168, 170, 171, 174, 180, 181, 184, 186, 188, 190, 191, 193, 195, 196, 197, 202, 207, 209, 210, 217, 218, 220, 221, 356
Blyth, Edward 19, 30, 34, 35, 36, 358
Botanic Garden, Calcutta [Kolkata] 19
Boys, William John Edward **10**, 14, 66, 119, 204, 232
British Association for the Advancement of Science 27
British Library 3, 13, 29
British Museum (BM) 2, 14, 16, 17, 18, 20, 24, 25, 27, 33, 34, 38, 44, 45, 46, 58, 84, 94, 96, 97, 98, 114, 128, 131, 140, 154, 162, 174, 186, 194, 198, 199
British Museum (Natural History), BM(NH) 2, 21, 25, 26, 28, 33, 34, 43, 44, 45, 46, 83, 105, 139, 144, 145, 151, 152, 154, 156, 159, 168, 199, 200, 218, 233, 238, 239, 241
Bristol Museum and Art Gallery (BMAG) 21, 43, 78
Brown, Rev. J.H. 5
Browne, Edward 10
Henrietta 10
Browning, George Wing 33, 138, 141, 156, 198
Brunner Mond Company (later ICI) 44
Burkinyoung, Frederick White **10**, 13, 158

C

Caldwell, William James 4, 5, **10**, 166, 167
Canning, George 3
Cantor, Dr Theodor Edvard (=Theodore Edward) **10**, **18**, 19, 30, 31, 34, 36, 40, 45, 48, 59, 60, 94, 95, 96, 100, 102, 105, 106, 107, 108, 110, 112, 115, 116, 118, 125, 144, 160, 161, 163, 164, 165, 200, 210, 212, 213, 214, 222, 223, 224, 235, 356, 357, 358, 360
Chapman, Dr Henry **10**, 17, 67, 92, 211
Chesson, John **10**, 12, 121, 123
Conchological Society of Great Britain and Ireland 27, 32, 44
Couch, Jonathan 17
Countess of Normanton, see also Jane Agar **3**
Cox, Lieut. G.W. **10**, 15, 175, 176
Crosse, Joseph Charles Hippolyte 34
Cuming, Hugh 7, **10**, 17, 18, 33, 34, 38, 44, 57, 59, 60, 65, 69, 75, 76, 91, 94, 95, 108, 127, 142, 159, 161, 162, 168, 187, 199, 211, 212, 218, 224, 233, 234, 238, 239, 240, 243

D

Damon, Robert 38
Robert Ferris 38
Darwin, Charles 14, 29, 31, 65, 359
Day, Dr Francis **10**, 19, 20, 146, 175

E

East India College, see also Haileybury College 2, **3**, 4, 11, 12, 29

E continued
East India Company (EIC) 2, 3, 4, 9, 12, 15, 19, 20, 29, 30, 31, 34, 35, 95, 96, 100, 105, 106, 112, 116, 127, 160, 161, 163, 165, 210, 212, 214, 222, 224, 244, 358
East India Company's Museum (Leadenhall Street) see India Museum (London)

F
Fairbank, Rev. Samuel Bacon **10**, 12, 28, 121, 122, 126, 188, 189
Fedden [Francis] 28, 202
FitzGerald, Major **10**, 117
Forbes, Edward 2
Fry, Rev. John **10**, 34, 151
Fulton, Hugh 38, 39

G
Geological Society of London 13, 22, 32
Geological Survey of India 20, **20**, 21, 22, 27, 28, 31
Geological Survey of Ireland 20
Godwin, Sir Henry Thomas 23
Maria 22
Godwin-Austen, Henry Haverham **11**, 22–28, 31, 32, 33, 34, 38, 39, 81, 83, 84, 90, 104, 122, 136, 166, 180, 186
Kudikji 23, 25
Gomm, Lady Elizabeth **10**, 150
Gordon, Robert **10**, 14, 15, 45, 71, 74, 93, 101, 135, 162, 172, 173, 178, 190, 197, 206, 240, 357
Gordon, Mrs (wife of Robert) **10**, 15, 178, 206
Gouldsbury, Mrs 11, 12
Gray, Dr John Edward 14, 33
Great Trigonometrical Survey of India 23, 31, 32
Gude, Gerard Pierre Laurent Kalshoven (=G.K. Gude) **11**, 26, 32, 135, 136, 137

H
Haileybury College, see also East India College 2, 3, 29
Hanley, Sylvanus Charles Thorp 31, 32, **35**, 36, 37, 43, 56, 60, 356
Harmer, Sidney 28
Hatton, Lieut. **10**, 110
Haughton, John Colpoys **10**, 8, 15, 79, 88, 98, 135, 175, 191, 195, 204, 208, 209
Hawkins, J. Sydney **10**, 11, 15, 33, 34, 38, 44, 45, 46 57, 58, 64, 65, 71, 72, 91, 92, 93, 96, 97, 101, 103, 105, 107, 112, 117, 124, 126, 131, 135, 137, 138, 140, 141, 151, 152, 155, 156, 160, 171, 172, 173, 177, 178, 189, 190, 197, 198, 199, 200, 201, 224, 235, 240, 357
Helfer, Jan Vilém 15
Herbert, Captain James Dowling 7
Hooker, Joseph Dalton 21, 24
William Jackson, Sir 21
Hörnes, Moritz 27
Horsfield, Dr Thomas 19, 46, 58, 96, 97, 98, 99, 103, 113, 119, 162 211
Hudson, Mrs J.F. **10**, 33, 198, 199
Hutton, Capt. (later Major) Thomas **10**, 12, 13, 14, 28, 29, 38, 40, 45, 62, 91, 96, 104, 105, 108, 113, 120, 149, 152, 153, 157, 158, 164, 165, 177, 190, 192, 193, 207, 209, 232, 233, 238, 242, 354
Huxley, Thomas Henry 25, 27

I
Imperial Bureau of Entomology 26
Imperial College London, see also Royal School of Mines 22
India Museum, London 18, 19, 34, 35, 45, 46, 57, 58, 62, 94, 97, 103, 113, 119, 174, 186, 194, 201, 358
Indian Museum, Calcutta (Kolkata) 2, 19, 21, 22, 24, 28, 31, 32, 34, **35**, 36, 38, 46, 53, 59, 60, 62, 89, 94, 95, 96, 97, 98, 99, 100, 101, 103, 104, 105, 106, 107, 111, 112, 113, 115, 116, 117, 118, 122, 123, 124, 125, 126, 127, 128, 132, 133, 134, 137, 144, 150, 159, 161, 162, 163, 168, 170, 174, 176, 181, 182, 183, 186, 188, 190, 191, 194, 195, 202, 207, 208, 211, 215, 236, 241, 357, 358

J
Jenkins, Col. **10**, 15, 215, 217, 220, 221
Jerdon, Thomas Claverhill **10**, **11**, 17, 30, 32, 63, 67, 70, 73, 74, 76, 102, 121, 122, 143, 176, 177, 178, 179, 180, 189, 201, 207, 216, 237
Jones, Sir William 7

K
King, Dr D. **10**, 144
Kingdon-Ward, Frank 24
Kohlhoff, D. **10**, 100, 175, 181
Küster, Heinrich 34

L
Laidlay, J.W. **10**, 19, 177
Layard, Austen Henry, Sir 16
Barbara Anne (née Calthrop) 16
Edgar Leopold 2, **11**, 16, 29, 31, 32, 34, 43, 44, 47, 55, 59, 68, 70, 72, 73, 76, 92, 124, 127, 128, 132, 141, 142, 145, 148, 149, 150, 151, 152, 154, 156, 163, 169, 173, 176, 180, 183, 189, 198, 199, 247, 357
Edgar Leopold Calthrop 17
Charles Peter, Sir 16

L continued
Layard, Frederick Charles **10**, 16, 33, 36, 44, 45, 72, 113, 124, 126, 129, 146, 151, 158, 160, 169, 176, 180, 181, 201, 212
Nina 16
Lea, Isaac 8, 42
Lefroy, Lieut. **10**, 129, 145, 235
Linnean Society [of London] 19
Linter, Miss Juliana Emma 21, 43, 59, 61, 71, 79, 83, 86, 93, 94, 123, 130, 131, 133, 172, 215, 216
Lucas, Bernard Richard 44, 73
Lyon Playfair 22

M
Madras University 10
Malacological Society of London 27, 32, 44
Manchester Museum 34, 44, 128, 148, 360
Markham, Clements 27
Marshall, Guy 27
Mason, Rev. Francis 21
Maxwell, Mr 3
McAndrew, Robert **11**, 32, 33, 37, 39, 41, 42, 44, 60, 94, 97, 100, 101, 123, 198, 199, 203, 233, 356, 357
Medlicott, Henry Benedict **20**, 22
Michigan Museum of Zoology, Ann Arbor 28
Musée Royale de l'Afrique Centrale (Tervuren) 28
Museum of Comparative Zoology, Harvard 98, 99, 219, 220, 222, 259
Museum of the Asiatic Society 18, 35, 46, 58, 62, 89, 94, 96, 99, 119, 122, 127, 128, 137, 162, 173, 183, 186, 194, 202, 207, 208, 211, 229, 234
Museum of the EIC, Leadenhall Street, London, see India Museum (London)

N
National Archives, Kew 2
National Museum of Wales 21 28, 259
Natural History Museum, London (NHM) 2, 34
Nevill, Geoffrey 32, 36, 53, 358
Newton, Alfred 5
Edward 5

O
Oldham, Thomas **10**, **20**, 20, 22, 27, 31, 43, 45, 55, 65, 103, 210, 211
Owen, Richard 27
Oxford University Museum of Natural History (OUMNH) 34, 127, 161, 360

P
Parish, Charles 9
Pearson, Dr John Thomas **10**, 18, 34, 36, 46, 58, 66, 119, 177, 194
Peile, A.J. 34, 88
Pfeiffer, Louis (= Ludwig Karl Georg Pfeiffer) **10**, 14, 32, 34, 57, 75
Plowden, Pauline 23
Prashad, Baini 36
Preston, Hugh Berthon 28, 32

R
Reeve, Lovell 21, 31, 34, 38, 40
Robinson, Jesse 24
Roth, Dr **10**, 40, 149
Rowlatt, Major **10**, 15
Royal Botanic Gardens, Kew 21
Royal College Port Louis 5
Royal Geographical Society 27, 32
Royal School of Mines, London 22, 25
Royal Society 22, 27, 32

S
Sandhurst Military Academy 23
Sankey, Sir Richard Hieram 8, 9, **10**, **11**, 10, 31, 32, 33, 36, 37, 56, 131, 156, 172, 173, 197
Scott, Maria 4, 30
Shipley, Arthur 26
Smith, Edgar A. 26, 200
Smithe, Rev. Frederick Doyle 13
Joseph Doyle **10**, 13, 151, 182
Smithsonian Institution, Washington, USA 155
South African Museum, Cape Town 16, 34
Sowerby I, George Brettingham 9, **10**, 30, 34, **35**, 46, 358
Stevens' Auction Rooms, Covent Garden 14, 18, 45, 117
Stevens, Samuel **10**, 87
Strange, Frederick **10**, 17, 87, 243
Stoliczka, Dr Ferdinand **20**, 27, 31, 32, 36, 188
Sykes, Ernest Ruthven 28, 93, 136, 145, 146, 197

T
Taylor, Lieut. W. **10**, 165
Theobald, William 2, 5, **10**, 15, **20**, 20, 21, 22, 28, 31, 32, 33, 35, 36, 38, 43, 45, 54, 55, 56, 59, 60, 61, 66, 68, 69, 71, 76, 77, 78, 79, 80, 81, 83, 86, 88, 89, 93, 98, 99, 104, 108, 111, 123, 125, 126, 130, 131, 133, 134, 144, 150, 153, 156, 159, 163, 168, 170, 172, 174, 177, 179, 181, 182, 183, 184, 185, 187, 188, 189, 195, 196, 197, 202, 203, 204, 205, 207, 208, 213, 214, 217, 218, 231, 232, 234, 356
Thomson, Dr Thomas **10**, 154
Townsend, Edward Hume 4
Traill, Dr William 42, 60, 68, 91
Trotter, Robert **10**, 13, 46, 47, 65, 71, 83, 84, 91, 161, 168, 187, 190, 191, 193, 194, 199

U
University Museum of Zoology, Cambridge (UMZC) 2, 5, 13, 21, 28, 32, 33, 36, **37**, 38, 39, 41, 43, 44, 45, 53
University of Cambridge 26

V
Vandorous, William 5
Veitch, Henry J. 26
Vizard, Thomas Trewren 33, 36

W
Walker, Dr James Pattison 15, 130, 164, 186, 191
Wallace, Alfred Russel 22
Wallich, Nathaniel Wolff 19, 29, 35
Williams, David 21
Westwood, John Obadiah 4
Woodward, Samuel Pickworth 16, 24, 106, 111, 129, 154

Z
Zoological Society of London 2, 27, 45, 213
Zoological Survey of India (ZSI) 2, 32, 46, 107, 219

INDEX

BENSON'S TAXA

Species and varieties are listed under the relevant genus as well as under the species names using Benson's original combinations. Genera described by Benson are also included. Figure numbers are shown in bold.

A

acarus, *Pupa* 152, **305**
acerra, *Helix* 194–195, **328**
Achatina
  arthuri 121, **288**
  botellus 121, **288**
  chessoni 121, **288**
  crassilabris 122, **288**
  erecta 127, **291**
  facula 122
  fairbanki 122, **289**
  hastula 127, **289**
  leptospira 123, **288**
  notigena 123, **289**
  orobia 123, **290**
  pachycheila 124
  panaetha 124, **289**
  parabilis 124, **290**
  praelustris 125, **290**
  pyramis 125, **290**
  sarissa 125, **290**
  scrutillus 125–126, **291**
  serena 126, **291**
  spiculum 120
  tenuispira 128, **292**
  vadalica 126, **291**
  veru 120–121
  veruina 126, **291**
Acmella tersa 103, **291**
acris, *Helix* 204, **335**
acuducta, *Helix* 179, **319**
aculus, *Clausilia* 160, **309**
albidens, *Helix* 167, **311**
altivagus, *Cyclophorus* 64, **257**
Alycaeus
  amphora 82–83, **269**
  andamaniae 78–79, **269**
  armillatus 79, **269**
  bembex 83–84, **269**
  constrictus var. *minor* 84, **270**
  crenulatus 81, **267**
  gemmula 80, **268**
  hebes 80, **268**
  otiphorus 84–85, **270**
  physis 81–82, **267**
  plectocheilus 80–81, **268**
  prosectus 82, **267**
  pyramidalis 78, **267**
  sculptilis 79–80, **269**
  stylifer 82, **267**
  umbonalis 81, **268**
  urnula 83, **269**
amphora, *Alycaeus* 82–83, **269**
ampulla, *Helix* 179, **319**
anostoma, *Cyclostoma* 91, **273**
anax, *Helix* 146, **301**
Ancylus
  ceylanicus 118, **287**
  verruca 118–119, **287**
andamaniae, *Alycaeus* 78–79, **269**
andamanica, *Helicina* 54, **252**
andamanica, *Streptaxis* 133, **295**
annesleyi, *Clea* 109–110, **283**
Anodon gibbum 214, **341**
Anodonta soleniformis 222, **341**
apicatum, *Leptopoma* 68–69, **260**
aratum, *Cyclostoma* 102, **279**
Arca galactodes 214, **340**
arenicola, Bulimus 149, **304**
armillatus, *Alycaeus* 79, **269**
arnotti, *Helix* 199–200, **330**
artata, *Pupina* 87–88, **272**
arthuri, *Achatina* 121, **288**
artificiosa, *Helix* 143–144, **300**
arula, *Pupina* 88, **272**
arx, *Helix* 169–170, **313**
aspides, *Helix* 185, **323**
Assiminea fasciata 103, **279**
attegia, *Helix* 170, **313**
aulopsis, *Helix* 185, **323**
aurora, *Cyclostoma* 64, **257**
austenianus, *Cataulus* 92, **274**
australiae, *Diplommatina* 87
avanica, *Pupa* 153, **305**

B

baconi, *Bulimus* 147, **302**
baconi, *Helix* 179, **319**
Balantium bicarinatum 110
balteatus, *Cyclophorus* 59
barclayi, *Helix* 165–166, **311**
bascauda, *Helix* 196, **329**
basilessa, *Helix* 175, **315**
basileus, *Helix* 175, **316**
bathyodon, *Pupa* 153, **306**

B continued
Batillaria 244
bembex, Alycaeus 83–84, **270**
bengalensis var. balteata, Paludina 94–95
benjamiticus, Bulimus 149–150
bicarinatum, Balantium 110
bidenticulata, Helix 143, **300**
bifoveata, Helix 202–203, **334**
bilabiatus, Pterocyclos 75, **265**
bilineata, Incilaria 162–163
bisculpta, Helix 138, **297**
Bithinia travancorica 105–106, **280**
blandi, Pterocyclos 75, **265**
blanfordi, Streptaulus 90, **273**
blanfordiana, Diplommatina 85, **271**
blennus, Otopoma 94, **274**
bolus, Helix 208, **337**
bombax, Helix 133, **295**
brachyplecta, Helix (Plectopylis) 135, **296**
brevicostis, Pupa 159, **308**
browningii, Helix 141, **298**
botellus, Achatina 121, **288**
boysianum, Carychium **13**, 119–120, **287**
bulbus, Clausilia 162, **309**
Bulimus
  arenicola 149, **304**
  baconi 147, **302**
  benjamiticus 149–150
  compressilabris 128, **292**
  domina 150, **303**
  estellus 129, **293**
  fuscoventris 201, **332**
  gemmula 148, **302**
  panos 150, **303**
  pertica 129, **293**
  physalis 201, **332**
  pleurophorus 89–90, **273**
  putus 130, **292**
  relegatus 129, **292**
  rufopictus 201, **333**
  salsicola 150, **303**
  sanguineus 149, **304**
  sinensis 200, **332**
  smithei 150–151, **303**
  stalix 151, **303**
  theobaldianus 200, **332**
  vesiculatus 149
Bullaea caurina 110
bullula, Helix 164, **310**

C
cacuminifera, Helix 180, **319**
cadiscus, Cyclophorus 72, **263**
caenosus, Planorbis 115–116, **286**
calathus, Planorbis 117, **285**
caldwelli, Helix 167, **311**
calias, *Helix* 172, **314**
calpis, *Helix* 90–91, **273**
calyx, *Cyclophorus* 70–71, **262**
Camptoceras 244
  terebra 114–115, **285**
Camptonyx 244–245
  theobaldi 111, **284**
Campylonaus (nomen nudum) 245
camura, *Helix* 193, **327**
cancellata, *Melania* 100, **278**
cantori, *Cyclostoma* 59, **254**
cantori, *Planorbis* 115
cantoriana, *Helix* 164, **310**
capessens, *Helix* 197, **330**
capitium, *Helix* 204–205, **335**
capsula, *Helix* 197–198, **330**
Carinaria
  cithara 102
  galea 103
Carychium
  boysianum **13**, 119–120, **287**
  indicum 119, **287**
cassida, *Helicarion* 192, **327**
cassidula, *Helix* 184, **320**
castra, *Helix* 168, **312**
Cataulus
  austenianus 92, **274**
  decorus 92, **274**
catinus, *Helix* (= *Helix cyclaspis*) 134, **296**
cauisa, *Helix* 184, **323**
caurina, *Bullaea* 110
celox, *Scaphula* 213, **340**
cerameopoma, *Paludina* 104–105, **280**
ceraria, *Helix* 176, **316**
cernica, *Tornatellina* 148, **304**
ceryx, *Helix* 163
cestus, *Helix* 208, **337**
cetra, *Pterocyclos* 75, **266**
ceylanica, *Clausilia* 160, **309**
ceylanicus, *Ancylus* 118, **287**
cingalensis, *Helix* 180, **320**
cingalensis, *Pterocyclos* 76, **265**
cingalensis, *Spiraxis* 212
cingalensis, *Streptaxis* 132, **294**
cingulata, *Stenothyra* 107–108, **282**
cithara, *Carinaria* 102
Charax 245
charybdis, *Helix* 139, **298**
chessoni, *Achatina* 121, **288**
chlamys, *Lymnaea* 111, **284**
chloroplax, *Helix* 181, **321**
choinix, *Helix* 185–186, **323**

C continued
Clausilia
aculus 160, **309**
bulbus 162, **309**
ceylanica 160, **309**
ios 161, **309**
loxostoma 162, **309**
pluviatilis 161, **309**
stylus 162
Clea annesleyi 109–110, **283**
climacterica, *Helix* 181–182, **321**
climacterica nana, *Helix* 182
Clostophis 245
sankeyi 156, **307**
coeloconus, *Cyclostoma* 70, **263**
Coelopoma 245
Coilostele 245
scalaris 120, **287**
compressa, *Neritina* 58
compressilabris, *Bulimus* 128, **292**
consepta, *Helix* 195, **323**
contracta, *Helix* 206–207, **336**
constrictum, *Cyclostoma* 84, **270**
constrictus var. *minor*, *Alycaeus* 84
convallata, *Helix* 184, **322**
convexiusculus var. *minor*, *Cyclophorus* 59
Corbicula
fuscata 222, **349**
quilonicca 222–223, **349**
cornucopia, *Neritina* 57, **252**
corys, *Helix* 196, **329**
costulatum, *Diplommatina* 85, **271**
cotelydonis, *Helix* 198, **331**
crassa, *Paludina* 96, **275**
crassicosta, *Helix* 207, **336**
crassilabris, *Achatina* 122, **288**
cratera, *Cyclophorus* 72, **263**
crebricostis, *Melania* 100
crenulatus, *Alycaeus* 81, **267**
crinigera, *Helix* 143, **299**
crispisulcatus, *Unio* 217–218, **343**
cryptomphalus, *Cyclophorus* 65, **258**
cuspidatum, *Cyclostoma* 67, **260**
Cuvieria oryza 110, **283**
Cyathopoma (?) *tignarium* 74, **265**
cybeus, *Leptopoma* 66, **258**
cyclaspis, *Helix* 134–135, **296**
Cyclophorus
altivagus 64, **257**
balteatus 59
cadiscus 72, **263**
calyx 70–71, **262**
convexiusculus var. *minor* 59
cratera 72, **263**
cryptomphalus 65, **258**
cytopoma 72, **263**
exul 66, **257**
flavilabris 60
malayanum 60, **254**
parapsis 72–73, **264**
parma 73, **264**
pinnulifer 71–72, **262**
pyrotrema 63–64, **256**
scissimargo 67–68, **261**
scurra 61, **255**
theobaldianus 61, **255**
tomotrema 68, **261**
tryblium 67, **259**
cycloplax, *Helix* 193, **328**
Cyclostoma
anostoma 91, **273**
aratum 102, **279**
aurora 64, **257**
cantori 59, **254**
coeloconus 70, **263**
constrictum 84, **270**
cuspidatum 67, **260**
filocinctum 73–74, **264**
funiculalum 91, **273**
halophilum 69–70, **261**
involvulus 62–63
jerdoni 63, **256**
liricinctum 109, **283**
milium 154–155, **307**
orbiculatum 109, **283**
orophilum 70, **261**
phaenotopicum 71, **262**
quadrifilosum 68, **261**
nilagiricum 63, **256**
pearsoni 66–67, **259**
porphyriticum 60, **254**
ravidum 73, **264**
sarritum 56, **253**
trochlea 74, **265**
wahlbergi 87, **272**
zebrinum 62, **255**
cyclotrema, *Helix* 203, **334**
cygnea, *Helix* 142, **299**
cyix, *Helix* 176, **316**
cysis, *Helix* 176, **317**
cytopoma, *Cyclophorus* 72, **263**

D
dadion, *Pupa* 156, **307**
decorus, *Cataulus* 92, **274**
decussata, *Nanina* 186, **323**
delibratus, *Helix* 201–202, **334**
deltae, *Nematura* 107, **282**

D continued
depressa, *Neritina* 58, **252**
diopsis, *Pupa* 158–159, **308**
Dioryx 245
diplocheilus, *Diplommatina* 85–86, **271**
diplodon, *Helix* 196–197, **329**
Diplommatina 245
australiae 87
blanfordiana 85, **271**
costulatum 85, **271**
diplocheilus 85–86, **271**
pachycheilus 86, **271**
polypleuris 86, **271**
pullulan 87, **271**
distermina, *Omphalotropis* 104, **279**
divergens, *Unio* (*Theliderma*) 214
domina, *Bulimus* 150, **303**
Dreissena purpurascens 212
dumeticola, *Helix* 145–146, **301**

E
edgariana, *Vitrina* 183
elegans, *Melania* 101, **278**
Ennea stenopylis 134, **295**
erecta, *Achatina* 127, **291**
estellus, *Bulimus* 129, **293**
eurina, *Pupa* 147, **302**
exul, *Cyclophorus* 66, **257**

F
facula, *Achatina* 122
fairbanki, *Achatina* 122, **289**
fasciata, *Assiminea* 103, **279**
favidens, *Unio* 218, **345**
favidens var. *chrysis*, *Unio* 219, **346**
favidens var. *deltae*, *Unio* 219, **346**
favidens var. *densa*, *Unio* 219
favidens var. *marcens*, *Unio* 219–220, **346**
favidens var. *trigona* 220, **347**
favidens var. *viridula* 220
filocinctum, *Cyclostoma* 73–74, **264**
fissilabris, *Hyalaea* 111
flavilabris, *Cyclophorus* 60
forabilis, *Helix* 172, **314**
foveolata, *Stenothyra* 108, **282**
fritillata, *Helix* 207, **336**
frustillum, *Stenothyra* 108
frustrillum, Hydrocena 55, **253**
fryana, *Pupa* 151, **305**
funiculalum, *Cyclostoma* 91, **273**
fuscata, *Corbicula* 222, **349**
fuscoventris, *Bulimus* 201, **332**

G
galactodes, *Arca* 214, **340**
galea, *Carinaria* 103
galea, *Helix* 205, **335**
galerus, *Helix* 169, **312**
gangetica, *Novaculina* 224, **351**
gemmula, *Alycaeus* 80, **268**
gemmula, *Bulimus* 148, **302**
gibbum, *Anodon* 214, **341**
gigas, *Vitrina* 173, **315**
gordoni, *Opisthoporus* 74
gordoniae, *Helix* 178, **318**
gravidum, Megalomastoma 93, **274**
gutta, *Pupa* 147

H
halophilum, *Cyclostoma* 69–70, **261**
hariola, *Helix* 205, **335**
harpula, *Omphalotropis* 104, **279**
hastula, *Achatina* 127, **292**
haughtoni, *Helix* 175, **315**
haughtoni, *Rhiostoma* 77–78, **266**
haughtoni, *Spiraxis* 130, **293**
haughtoni var. oxynter, *Spiraxis* 130, **293**
hebes, *Alycaeus* 80, **268**
helferi, *Helix* 203, **334**
Helicarion cassida 192, **327**
Helicina
andamanica 54, **252**
scrupulum 55, **252**
Helicorbis 246
Helix
acerra 194–195, **328**
acris 204, **335**
acuducta 179, **319**
albidens 167, **311**
ampulla 179, **319**
anax 146, **301**
artificiosa 143–144, **300**
arnotti 199–200, **330**
arx 169–170, **313**
aspides 185, **323**
attegia 170, **313**
aulopsis 185, **323**
baconi 179, **319**
barclayi 165–166, **311**
bascauda 196, **329**
basilessa 175, **315**
basileus 175, **316**
bidenticulata 143, **300**
bifoveata 202–203, **334**
bisculpta 138, **297**
bolus 208, **337**
bombax 133, **295**

H continued
Helix continued
brachyplecta (*Plectopylis*) 135, **296**
browningii 141, **298**
bullula 164, **310**
cacuminifera 180, **319**
caldwelli 167, **311**
calias 172, **314**
calpis 90–91, **273**
camura 193, **327**
cantoriana 164, **310**
capessens 197, **330**
capitium 204–205, **335**
capsula 197–198, **330**
cassidula 184, **320**
castra 168, **312**
catinus 134, **296**
cauisa 184, **323**
ceraria 176, **316**
ceryx 163
cestus 208, **337**
charybdis 139, **298**
chloroplax 181, **321**
choinix 185–186, **323**
cingalensis 180, **320**
climacterica 181–182, **321**
climacterica nana 182
consepta 195, **323**
contracta 206–207, **336**
convallata 184, **322**
corys 196, **329**
cotyledonis 198, **331**
crassicosta 207, **336**
crinigera 143, **299**
cyclaspis 134–135, **296**
cycloplax 193, **328**
cyclotrema 203, **334**
cygnea 142, **299**
cyix 176, **316**
cysis 176, **317**
delibratus 201–202, **334**
diplodon 196–197, **329**
dumeticola 145–146, **301**
forabilis 172, **314**
fritillata 207, **336**
galea 205, **335**
galerus 169, **312**
gordoniae 178, **318**
hariola 205, **335**
haughtoni 175, **315**
helferi 203, **334**
hemiopta 204, **334**
hodgsoni 186, **324**
hudsoniae 198, **330**
humilis 157, **307**
hyba 182, **322**
hyptiocyclos 113, **285**
infula see *Helix turbiniformis*
interrupta 176, **317**
laidlayana 177, **316**
lecythis 186, **326**
leiophis 136, **296**
levicula 167, **312**
lubrica 187, **324**
lychnia 163, **310**
macropleuris 196, **329**
marcida 180, **320**
miccyla 158, **308**
molecula 187, **324**
mononema 143, **300**
munda 139–140
nana 164–165, **310**
naninoides 165, **311**
neherensis 187–188, **324**
ochthoplax 202, **333**
odontophora (*Corilla*) 146, **301**
oldhami 211, **338**
omphalion 140, **298**
orbicula 211, **338**
orcula 158, **308**
ornatissima 182–183, **321**
orobia 194, **328**
oxytes 194, **328**
palmaria 170, **313**
paludicola 141, **298**
pansa 183, **322**
patane 188, **324**
pauxillula 188, **325**
pedina 188–189, **325**
peguensis 209, **337**
perfucata 189
perpaula 185
perplicata 140, **298**
petasus 189, **325**
petrobia 141
phyllophila 171, **314**
phytostylus 198–199, **331**
pilidion 209, **337**
pinacis 137, **297**
planiuscula 190, **325**
plectilis 206, **336**
plectostoma 137–138, **297**
prionacis 140–141
puteolus 142, **299**
pylaica 197, **330**
radicicola 209–210, **337**
ravida 210, **338**
refuga var. *dextrorsa* (*Plectopylis*) 135–136, **296**

H continued
Helix continued
regalis 165, **311**
regulata 169, **312**
remota 163, **310**
rimicola 171, **314**
rorida 190, **325**
rosamonda 180–181, **320**
sabuletorum 139, **297**
sanis 164, **310**
scalpturita 210, **338**
scenoma 205–206, **335**
scenoma var. *depressa* 206, **335**
schistostelis 173, **314**
seposita 168
sequax 190–191, **326**
serrula 183, **322**
setiliris 166, **311**
solata 177, **317**
stephus 191
subjecta 191, **326**
sublesta 142, **299**
suffulta 166
tapeina 210–211, **338**
tescorum 206, **336**
textrina 178–179, **318**
thyreus 178, **318**
tollini 138, **297**
travancorica 181, **321**
trotteriana 199, **331**
trochalia 207–208, **336**
tugurium 191, **326**
turbiniformis 171, **313**
vilipensa 169, **312**
vorticialis 139, **298**
hemiopta, *Helix* 204, **334**
hemisphaerula, *Planorbis* 117–118, **285**
Heteropoma 246
himalayae, *Pomatias* 89, **273**
himalayana, *Pupa* 157, **308**
hodgsoni, *Helix* 186, **324**
hudsoniae, *Helix* 198, **330**
humilis, *Helix* 157, **307**
huttoniana, *Pupa* 153, **306**
Hyalaea fissilabris 111
hyba, *Helix* 182, **322**
Hybocystis 246
Hydrocena
frustrillum 55, **253**
ilex 55–56, **253**
noticola 55, **253**
pyxis 56, **253**
rawesiana 56, **253**
Hypselostoma 246
hyptiocyclos, *Helix* 113, **285**

I
illex, *Hydrocena* 55–56, **253**
infula, *Helix* see *Helix turbiniformis*
imbricifera, *Pupina* 88, **272**
imperialis, *Succinea* 145
Incilaria 246
bilineata 162
indicus, *Planorbis* 112–113, **284**
indicum, *Carychium* 119, **287**
inflatus, *Oxygyrus* 102
interrupta, *Helix* 176, **317**
involvulus, *Cyclostoma* 62–63
ios, *Clausilia* 161, **309**
iridescens, *Sanguinolaria* 223–224, **350**

J
jenkinsianus, *Unio* 215, **342**
jerdoni, *Cyclostoma* 63, **256**

L
labiatus, *Planorbis* 114
labiosa, *Paludomus* 98–99, **277**
laevirostris, *Unio* 218, **344**
Laguncula 246
pulchella 102, **279**
laidlayana, *Helix* 177, **316**
layardi, *Pupa* 151–152, **304**
layardi var. *minor*, *Pupa* 152, **304**
layardi, *Spiraxis* 128–129, **292**
layardiana, *Streptaxis* 132, **294**
lecythis, *Helix* 186, **326**
lecythis, *Paludina* 95, **275**
lecythoides, *Paludina* 95–96, **275**
leioma, *Unio* 216, **343**
leiophis, *Helix* 136, **296**
Leptopoma
apicatum 68–69, **260**
cybeus 66, **258**
leptospira, *Achatina* 123, **288**
levicula, *Helix* 167, **312**
lirata, Melania 100–101, **278**
liricinctum, *Cyclostoma* 109, **283**
longicornis, *Paludina* (*Bithynia*) 105, **280**
loxostoma, *Clausilia* 162, **309**
lubrica, *Helix* 187, **324**
lychnia, *Helix* 163, **310**
Lymnaea
chlamys 111, **284**
minor 112
plicatula 112, **284**

M
macilentus, *Unio* 216–217, **343**
macropleuris, *Helix* 196, **329**
malayanum, *Cyclophorus* 60, **254**
marcida, *Helix* 180, **320**
Megalomastoma gravidum 93, **274**
Melania
cancellata 100, **278**
crebricostis 100
elegans 101, **278**
lirata 100–101, **278**
pyramis 101, **278**
stephanus 99, **277**
terebra 98, **276**
variabilis 97, **276**
zonata 97, **276**
membranacea, *Vitrina* 173, **315**
miccyla, *Helix* 158, **308**
milium, *Cyclostoma* 154–155, **307**
mimula, *Pupa* 154, **306**
minor, *Lymnaea* 112
Modiola
senhousia 212–213, **339**
variegata 213, **339**
molecula, *Helix* 187, **324**
monilifera, *Stenothyra* 108, **282**
mononema, *Helix* 143, **300**
montana, *Tricula* 106, **281**
monticola, *Nanina* 193, **327**
munda, *Helix* 139–140
muscerda, *Pupa* 148, **302**
Mytilus niger 212

N
nana, *Helix* 164–165, **310**
Nanina
decussata 186, **323**
monticola 193, **327**
splendens 195–196, **329**
vesicula 191–192, **326**
naninoides, *Helix* 165, **311**
nanus, *Pterocyclos* 76, **266**
neherensis, *Helix* 187–188, **324**
Nematura 246
deltae 107, **282**
Neritina
compressa 58
cornucopia 57, **252**
depressa 58, **252**
tigrina 57, **252**
niger, *Mytilus* 212
nilagiricum, *Cyclostoma* 63, **256**
noticola, *Hydrocena* 55, **253**
notigena, *Achatina* 123, **289**
Novaculina 246–247
gangetica 224, **351**

O
ochthoplax, *Helix* 202, **333**
odontophora, *Helix* (*Corilla*) 146, **301**
ofella, *Pupa* 132, **293**
oldhami, *Helix* 211, **338**
Omalodiscus 247
omphalion, *Helix* 140, **298**
Omphalotropis
distermina 104, **279**
harpula 104, **279**
Opisthoporus 247
gordoni 74
orbicula, *Helix* 211, **338**
orbiculatum, *Cyclostoma* 109, **283**
orcula, *Helix* 158, **308**
orientalis, *Succinea* 144, **301**
ornata, *Paludomus* 98, **277**
ornatissima, *Helix* 182–183, **321**
orobia, *Achatina* 123, **290**
orobia, *Helix* 194, **328**
orophilum, *Cyclostoma* 70, **261**
oryza, *Cuvieria* 110, **283**
otiphorus, *Alycaeus* 84–85, **270**
Otopoma blennus 94, **274**
Oxygyrus 247
inflatus 102
oxytes, *Helix* 194, **328**
oxytropis, *Paludina* 94, **275**

P
pachycheila, *Achatina* 124
pachycheilus, *Diplommatina* 86, **271**
pachysoma, *Unio* 217, **344**
palmaria, *Helix* 170, **313**
paludicola, *Helix* 141, **298**
Paludina
bengalensis var. *balteata* 94–95
cerameopoma 104–105, **280**
crassa 96, **275**
lecythis 95, **275**
lecythoides 95–96, **275**
longicornis 105, **280**
oxytropis 94, **275**
pulchella 105, **280**
quadrata 96, **276**
striatula 106, **280**
Paludomus
labiosa 98–99, **277**
ornata 98, **277**
regulata 99, **277**
pamphorodon, *Pupa* 152, **305**

P continued
panaetha, *Achatina* 124, **289**
panos, *Bulimus* 150, **303**
pansa, *Helix* 183, **322**
papyraceus, *Planorbis* 116, **286**
parabilis, *Achatina* 124, **290**
parapsis, *Cyclophorus* 72–73, **264**
parma, *Cyclophorus* 73, **264**
patane, *Helix* 188, **324**
pauxillula, *Helix* 188, **325**
pearsoni, *Cyclostoma* 66–67, **259**
pedina, *Helix* 188–189, **325**
peguensis, *Helix* 209, **337**
peguensis, *Pupina* 88–89, **272**
perfucata, *Helix* 189
perpaula, *Helix* 185
perplicata, *Helix* 140, **298**
pertica, *Bulimus* 129, **293**
petasus, *Helix* 189, **325**
petrobia, *Helix* 141
phaenotopicum, *Cyclostoma* 71, **262**
phyllophila, *Helix* 171, **314**
physalis, *Bulimus* 201, **332**
physis, *Alycaeus* 81–82, **267**
phytostylus, *Helix* 198–199, **331**
pilidion, *Helix* 209, **337**
pinacis, *Helix* 137, **297**
pinax, *Unio* 220, **347**
pinna, *Scaphula* 213–214, **340**
pinnulifer, *Cyclophorus* 71–72, **262**
plagiostoma, *Unio* 221, **347**
planguncula, *Pupa* 133, **295**
planiuscula, *Helix* 190, **325**
Planorbis
  caenosus 115–116, **286**
  calathus 115, **285**
  cantori 115
  hemisphaerula 117–118, **285**
  indicus 112–113, **284**
  labiatus 114
  papyraceus 116, **286**
  rotula 114, **285**
  sindicus 116, **286**
  trochoideus 116, **286**
  umbilicalis 115, **286**
planospira, *Vitrina* 174, **315**
plectilis, *Helix* 206, **336**
plectocheilus, *Alycaeus* 80–81, **268**
Plectopylis 247
plectostoma, *Helix* 137–138, **297**
pleurophorus, *Bulimus* 89–90, **273**
plicatula, *Lymnaea* 112, **284**
plicidens, *Pupa* 155, **307**
pluviatilis, *Clausilia* 161, **309**
polypleuris, *Diplommatina* 86, **271**
Pomatias himalayae 89, **273**
porphyriticum, *Cyclostoma* 60, **254**
praelustris, *Achatina* 125, **290**
prionacis, *Helix* 140–141
prosectus, *Alycaeus* 82, **267**
Pterocyclos 247
  bilabiatus 75, **265**
  blandi 75, **265**
  cetra 75, **266**
  cingalensis 76, **265**
  nanus 76, **266**
  pullatus 76–77, **266**
  rupestris 77, **266**
  troscheli 77, **265**
pugio, *Unio* 216, **342**
pulchella, *Laguncula* 102, **279**
pulchella, *Paludina* 105, **280**
pullatus, *Pterocyclos* 76–77, **266**
pullula, *Diplommatina* 87, **271**
Pupa
  acarus 152, **305**
  avanica 153, **305**
  bathyodon 153, **306**
  brevicostis 159, **308**
  dadion 156, **307**
  diopsis 158–159, **308**
  eurina 147, **302**
  fryana 151, **305**
  gutta 147
  huttoniana 153, **306**
  himalayana 157, **308**
  layardi 151–152, **304**
  layardi var. *minor* 152, **304**
  mimula 154, **306**
  muscerda 148, **302**
  ofella 132, **293**
  pamphorodon 152, **305**
  planguncula 133, **295**
  plicidens 155, **307**
  regia 144, **300**
  rivierana 157, **308**
  seriola 159, **308**
  serrula 154, **306**
  thibetica 154, **306**
  vara 134, **293**
Pupina
  artata 87–88, **272**
  arula 88, **272**
  imbricifera 88, **272**
  peguensis 88–89, **272**
purpurascens, *Dreissena* 212
puteolus, *Helix* 142, **299**
putus, *Bulimus* 130, **292**

P continued
pylaica, *Helix* 197, **330**
pyramidalis, *Alycaeus* 78, **267**
pyramis, *Achatina* 125, **290**
pyramis, *Melania* 101, **278**
pyrotrema, *Cyclophorus* 63–64, **256**
pyxis, *Hydrocena* 56, **253**

Q
quadrata, *Paludina* 96, **276**
quadrifilosum, *Cyclostoma* 68, **261**
quilonica, *Corbicula* 222–223, **349**

R
radicicola, *Helix* 209–210, **337**
ravida, *Helix* 210, **338**
ravidum, *Cyclostoma* 73, **264**
rawesiana, *Hydrocena* 56, **253**
refuga var. *dextrorsa*, *Helix* (*Plectopylis*) 135–136, **296**
regia, *Pupa* 144, **300**
regalis, *Helix* 165, **311**
regulata, *Helix* 169, **312**
regulata, *Paludomus* 99, **277**
relegatus, *Bulimus* 129, **292**
remota, *Helix* 163, **310**
Rhiostoma 247
  haughtoni 77–78, **266**
rimicola, *Helix* 171, **314**
rivalis, *Tanysiphon* 223, **350**
rivierana, *Pupa* 157, **308**
rorida, *Helix* 190, **325**
rosamonda, *Helix* 180–181, **320**
rotula, *Planorbis* 114, **285**
rufopictus, *Bulimus* 201, **333**
rupestris, *Pterocyclos* 77, **266**

S
sabuletorum, *Helix* 139, **297**
salius, *Vitrina* 168, **312**
salsicola, *Bulimus* 150, **303**
sanguineus, *Bulimus* 149, **304**
Sanguinolaria iridescens 223–224, **350**
sanis, *Helix* 164, **310**
sankeyi, *Clostophis* 156, **307**
sankeyi, *Streptaxis* 131, **294**
sarissa, *Achatina* 125, **290**
sarritum, *Cyclostoma* 56, **253**
scalaris, *Coilostele* 120, **287**
scalpturita, *Helix* 210, **338**
Scaphula 247
  celox 213, **340**
  pinna 213–214, **340**
Scarabus triangularis 119, **287**
scenoma, *Helix* 205–206, **335**
scenoma var. *depressa*, *Helix* 206, **335**
schistostelis, *Helix* 173, **314**
scissimargo, ? *Cyclophorus* 67–68, **261**
scrupulum, Helicina 55, **252**
scrutillus, *Achatina* 125–126, **291**
sculptilis, *Alycaeus* 79–80, **269**
scurra, *Cyclophorus* 61, **255**
scutella, *Vitrina* 174, **327**
senhousia, *Modiola* 212–213, **339**
seposita, *Helix* 168
sequax, *Helix* 190–191, **326**
serena, *Achatina* 126, **291**
Serenia 247
seriola, *Pupa* 159, **308**
serrula, *Helix* 183, **322**
serrula, *Pupa* 154, **306**
setiliris, *Helix* 166, **311**
sindicus, *Planorbis* 116, **286**
sinensis, *Bulimus* 200, **332**
smaragdites, *Unio* 221, **348**
smithei, *Bulimus* 150–151, **303**
solata, *Helix* 177, **317**
soleniformis, *Anodonta* 222, **341**
Sophina 247
spiculum, *Achatina* 120
Spiraxis
  cingalensis 212
  haughtoni 130, **293**
  haughtoni var. oxynter 130, **293**
  layardi 128–129, **292**
  walkeri 130–131, **293**
splendens, *Nanina* 195–196, **329**
stalix, *Bulimus* 151, **303**
stenopylis, *Ennea* 134, **295**
Stenothyra 247
  cingulata 107–108, **282**
  foveolata 108, **282**
  frustillum 108
  monilifera 108, **282**
  strigilata 108, **282**
stephanus, *Melania* 99, **277**
stephus, *Helix* 191
Stomatodon 248
stomatodon, *Tanalia* (?) 100, **278**
Streptaulus 248
  blanfordi 90, **273**
Streptaxis
  andamanica 133, **295**
  cingalensis 132, **294**
  layardiana 132, **294**
  sankeyi 131, **294**
  theobaldi 131, **294**
striatula, *Paludina* (*Bithynia*) 106, **280**
strigilata, *Stenothyra* 108, **282**

S continued
stylifer, *Alycaeus* 82, **267**
stylus, Clausilia 162
subjecta, *Helix* 191, **326**
sublesta, *Helix* 142, **299**
Succinea
imperialis 145
orientalis 144, **301**
suffulta, *Helix* 166

T
Tanalia (?) *stomatodon* 100, **278**
Tanychlamys 248
Tanysiphon 248
rivalis 223, **350**
Tanystoma 248
tubiferum 155–156, **307**
tapeina, *Helix* 210–211, **338**
tenuispira, *Achatina* 128, **292**
terebra, *Camptoceras* 114–115, **285**
terebra, *Melania* 98, **276**
tersa, *Acmella* 103, **279**
tescorum, *Helix* 206, **336**
textrina, *Helix* 178–179, **318**
theca, *Unio* 215, **342**
theobaldi, *Camptonyx* 111, **284**
theobaldi, *Streptaxis* 131, **294**
theobaldianus, *Bulimus* 200, **332**
theobaldianus, *Cyclophorus* 61, **255**
thibetica, *Pupa* 154, **306**
thyreus, *Helix* 178, **318**
tignarium, *Cyathopoma* 74, **265**
tigrina, *Neritina* 57, **252**
tollini, *Helix* 138, **297**
Tomichia 248
tomotrema, *Cyclophorus* ? 68, **261**
Tornatellina cernica 148, **304**
travancorica, *Bithinia* 105–106, **280**
travancorica, *Helix* 181, **321**
triangularis, *Scarabus* 119, **287**
Tricula 248
montana 106, **281**
triembola, *Unio* 221, **348**
trochalia, *Helix* 207–208, **336**
trochlea, *Cyclostoma* 74, **265**
trochoideus, *Planorbis* 116, **286**
Trochorbis 248–249
troscheli, *Pterocyclos* 77, **265**
trotteriana, *Helix* 199, **331**
tryblium, *Cyclophorus* 67, **259**
tubiferum, *Tanystoma* 155–156, **307**
tugurium, *Helix* 191, **326**
turbiniformis, *Helix* 171, **313**

U
umbilicalis, *Planorbis* 115, **286**
umbonalis, *Alycaeus* 81, **268**
Unio
crispisulcatus 217–218, **343**
favidens (nominate form) 218, **345**
favidens var. *chrysis* 219, **346**
favidens var. *deltae* 219, **346**
favidens var. *densa* 219
favidens var. *marcens* 219–220, **347**
favidens var. *trigona* 220, **347**
favidens var. *viridula* 220
jenkinsianus 215, **342**
laevirostris 218, **344**
leioma 216, **343**
macilentus 216–217, **343**
pachysoma 217, **344**
pinax 220, **347**
plagiostoma 221, **347**
pugio 216, **342**
smaragdites 221, **342**
theca 215, **342**
triembola 221, **348**
Unio (*Theliderma*) *divergens* 214
urnula, *Alycaeus* 83, **269**

V
vadalica, *Achatina* 126, **291**
vara, *Pupa* (*Ennea*) 134, **293**
variabilis, *Melania* 97, **276**
variegata, *Modiola* 213, **339**
verruca, *Ancylus* 118–119, **287**
veru, *Achatina* 120–121
veruina, *Achatina* 126, **291**
vesicula, *Nanina* 191–192, **326**
vesiculatus, *Bulimus* 149
vilipensa, *Helix* 169, **312**
Vitrina
edgariana 183
gigas 173, **315**
membranacea 173, **315**
planospira 174, **315**
salius 168, **315**
scutella 174, **327**
vorticialis, *Helix* 139, **298**

W
wahlbergi, *Cyclostoma* 87, **272**
walkeri, *Spiraxis* 130–131, **293**

Z
zebrinum, *Cyclostoma* 62, **255**
zonata, *Melania* 97, **276**