

Miscellaneous South East Asian Cucurbit News IV¹

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ABSTRACT. Communications on nine genera in SE Asian Cucurbitaceae are presented. *Gomphogyne stenocarpa* sp. nov. and *Sinobaijania smitinandii* var. *laxa* var. nov. are described as new taxa, both for Thailand; one new combination, *Gomphogyne longgangensis* comb. nov., is proposed for southern China. Two *Trichosanthes* species are newly recorded for Thailand, *T. baviensis* and *T. pedata*. A new locality of the rare *Indomelothria blumei* is mentioned for Thailand. Seeds of both *Coccinia grandis* and *Trichosanthes truncata*, fruit of *Cucumis debilis*, and fruit and seeds of both *Thladiantha hookeri* and *Thladiantha indochinensis* are discussed. Information on the androecium and pollen morphology of *Hodgsonia heteroclita* subsp. *indochinensis* and on a sterile growth form of *Zanonia indica* subsp. *orientalis* is presented.

KEY WORDS: Cucurbitaceae, *Coccinia*, *Gomphogyne*, *Hemsleya*, *Hodgsonia*, *Indomelothria*, *Sinobaijania*, *Thladiantha*, *Trichosanthes*, *Zanonia*.

INTRODUCTION

This fourth miscellaneous cucurbit news article deals with new findings or new taxonomic opinions in Cucurbitaceae since the publication of the family treatment for the Flora of Thailand (De Wilde & Duyfjes, 2008). These mostly concern the Cucurbitaceae of Thailand but also concern findings from a visit to the Institute of Ecology and Biological Resources, National Center for Natural Sciences and Technology in Hanoi (HN) in connection with the second Symposium on the Flora of Cambodia, Laos and Vietnam in 2010. It comprises communications as listed below. The pollen descriptions of *Hodgsonia* are by Van der Ham.

(I) The seeds of *Coccinia grandis* (L.) Voigt

(II) The fruit of *Cucumis debilis* W.J.de Wilde & Duyfjes

(III) The distinction of *Gomphogyne* from *Hemsleya*, a new species of *Gomphogyne* from

Thailand, and an updated enumeration of species in *Gomphogyne*

(IV) On the androecium and pollen morphology of *Hodgsonia heteroclita* (Roxb.) Hook.f & Thomson subsp. *indochinensis* W.J.de Wilde & Duyfjes

(V) *Indomelothria blumei* W.J.de Wilde & Duyfjes, seen in Thailand again

(VI) *Sinobaijania* C.Jeffrey & W.J.de Wilde: a new variety

(VII) The fruit of *Thladiantha hookeri* C.B.Clarke and *Thladiantha indochinensis* Merr.

(VIII) Additions to *Trichosanthes* in Thailand, Laos and Vietnam

(IX) A remarkable sterile growth form of *Zanonia indica* L. subsp. *orientalis* W.J.de Wilde & Duyfjes

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(I) THE SEEDS OF *COCCINIA GRANDIS* (L.) VOIGT

The seeds of *Coccinia grandis* were described by De Wilde & Duyfjes (2008) as follows: *Seeds*: 6–7 by 2.5–3 by ca 1.5 mm, \pm smooth, whitish, margin narrow. From new material, however, we found that the seed surface in fully ripe seed becomes significantly and neatly hairy when the pulpy radiately striate exotesta disintegrates into the dense hairy covering. Seeds of this species were described by Chakravorty

(1947) and by Corner (1976, fig. 164, 165) but the hairy nature of the mature seeds was not mentioned. Jeffrey (1967), Keraudren (1967, 1975), and Schaefer & Renner (2011a) described the testa as “fibrillose”, “fibreux”, “fibrilleux”, and “fibrillose” respectively, but it is not clear what is really meant by these terms. Fig. 1A.

(II) THE FRUIT OF *CUCUMIS DEBILIS* W.J.DE WILDE & DUYFJES

At the time *Cucumis debilis* was described (De Wilde & Duyfjes, 2007) the fruit was not known. Shortly thereafter a photograph of a fruit and viable seeds were received from Yunnan by the Munich Botanical Garden. Seeds germinated, but plants could not be brought to flowering. In 2008 fruiting specimens with ripe seeds were again found in SE Yunnan, but plants cultivated in the Netherlands have as yet produced neither flowers nor fruits. Cultivated plants reach sizes comparable to those of cultivated *C. sativus* L.f. *hardwickii* (Royle) W.J.de Wilde & Duyfjes or *C. hystrix* Chakrav., i.e. about 3 m long. The leaf blades of living *C. debilis* always have a characteristic yellow-green blotch at the base on the upper surface. The fruits in vivo are green, paler striped, and ripening lemon-yellow. They are ca 5 cm long and the size, shape and colour are reminiscent of medium-sized lemons. Unfortunately nothing has been preserved in a herbarium as far as we know. Fig. 2A.

(III) THE DISTINCTION OF *GOMPHOGYNE* FROM *HEMSLEYA*, ONE NEW SPECIES AND ONE NEW COMBINATION IN *GOMPHOGYNE*, AND AN UPDATED ENUMERATION OF SPECIES IN *GOMPHOGYNE*

In the revision of *Gomphogyne* (De Wilde et al., 2007) it was pointed out that *Gomphogyne* is to be regarded as a genus with several species, distinct from the closely related genus *Hemsleya* with ca 25 species. Before this revision *Gomphogyne* was regarded as monotypic. This was later corroborated by molecular studies (Li & Li, 2008), and followed by Schaefer & Renner (2011b), in which the only included and type species *G. cissiformis* is sister to *Hemsleya*. This latter view was also accepted by Lu & Jeffrey (2011). However, for the molecular analysis (Li & Li, 2008) the sampling in *Hemsleya* was inadequate because those taxa of *Hemsleya*

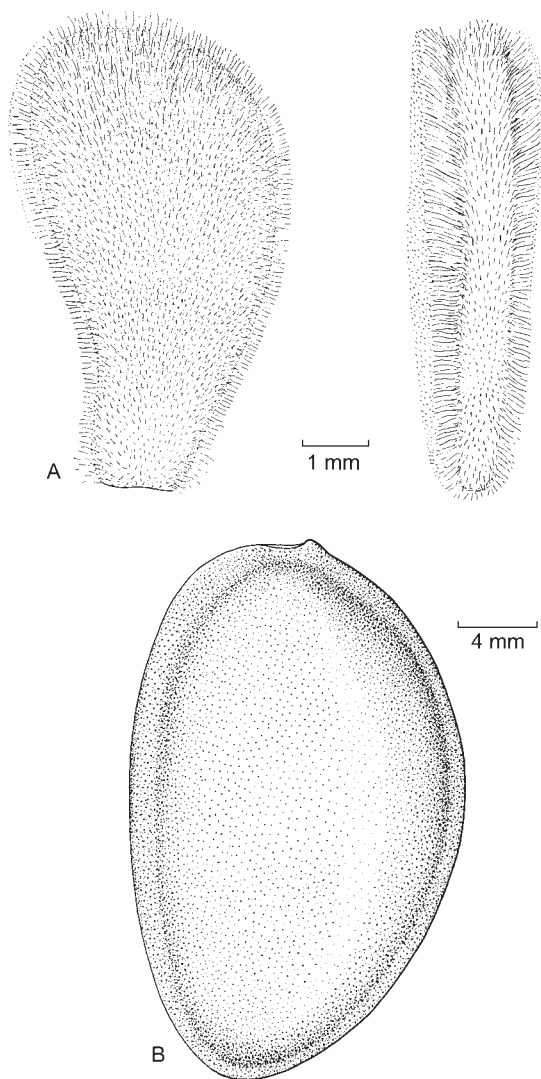


Figure 1. A. *Coccinia grandis* (L.) Voigt: Hairy seed (Gabor s.n. (L)); B. *Trichosanthes truncata* C.B. Clarke: Seed (Phonsena, De Wilde & Duyfjes 6329 (L)).

moved to *Gomphogyne* by De Wilde et al. (2007) were not included in the sampling, e.g. *H. heterosperma*. In the molecular trees of the Cucurbitaceae by Schaefer et al. (2009) and by Schaefer & Renner (2011b, supplementary material figs. S4–S5), the genus *Hemsleya* is densely sampled (23 species), but the genus *Gomphogyne*, as defined by the present authors, is represented only by two species, namely *G. cissiformis* and *G. cirromitrata*.

De Wilde et al. (2007) argued that a number of species then placed in *Hemsleya* should best be kept separate as a group, systematically intermediate between *Gomphogyne* s.s. and *Hemsleya*, but if one were to refrain from describing a new genus for this group then the species were closest to and should be united with *Gomphogyne*, the older genus name.

The morphological basis for this view comes from the fact that *Gomphogyne* species are non-tuberous annuals with smallish flowers with (narrowly) elliptic, acute petals, and fruits attached to supporting twigs by two (sub)opposite spiraling tendrils at the base (figs. 3E–F) (fruit with only one small tendril in *G. cissiformis*), whereas *Hemsleya* species are perennial tuberous plants with larger flowers with broader, blunt petals and fruits without basal tendrils. With this distinction in mind *H. graciliflora*, as treated by Lu & Jeffrey (2011), is discussed below. In passing it should be remarked that possibly some other species from China, at present assigned to *Hemsleya* might better be placed in *Gomphogyne*, and should be checked by Chinese botanists.

From the molecular trees as presented in Schaefer & Renner (2011b, supplementary material figs. S4–S5) *Gomphogyne cirromitrata* (Thailand) is sister to *Hemsleya* (China) rather than to *Gomphogyne cissiformis*. However, the sampling of this intermediate group as defined by de Wilde et al. (2007) is still very low and, coupled with the morphological distinction, we shall continue to maintain these species in *Gomphogyne* until better data is available.

Lectotypification of *Hemsleya graciliflora*

Hemsleya graciliflora (Harms) Cogn., Pflanzenr. (Engler) 66 (V.275.1): 24. 1916.— *Alsomitra*

graciliflora Harms, Bot. Jahrb. Syst. 29: 602. 1901. — Type: China, Sichuan, Wenchuan, *Von Rosthorn 3134* (lectotype **O**, designated here; islectotype **B**, lost), male flowering specimen.

Notes.— 1. This species of *Hemsleya* seems to be aberrant in the genus because of the male flowers with rather narrow, acute-acuminate petals, because of its apparently annual habit, and because of its fibrous rather than tuberous roots. However, its fruits, depicted by Cogniaux (1916, fig. 7) and apparently drawn from *Von Rosthorn 3136* or *Henry 4452* (both **B**, lost; duplicate of *Von Rosthorn 3136* in **O**), clearly represent a *Hemsleya*. These fruits, drawn from *Henry 4452*, are the same as erroneously added to the figure published for *H. chinensis*, the type-species of the genus (Cogniaux, 1889). The lectotype of *H. chinensis* (Jeffrey, 1980) *Henry 2436* (**K**) is the male flowering element.

2. *Hemsleya graciliflora*, as accepted by Lu & Jeffrey (2011), seems to represent more than one species. They include *H. longgangensis* X.X.Chen & D.R.Liang in synonymy but we regard the latter name rather to represent a separate species in the genus *Gomphogyne*. The description of *H. graciliflora* (Lu & Jeffrey, 2011) does not fully cover the characters as presented in the original description of *Alsomitra graciliflora* Harms (1901); the latter has e.g. male pedicels ca 5 mm long (1–2 mm long in Fl. of China); corolla 10–12 mm diam., and petals acute (corolla 5–6 mm diam., and petals obovate in Fl. of China); petioles 4–5 cm long (petioles 1.8–3 cm long in Fl. of China).

Enumeration of species in *Gomphogyne*

Since publication of the revision of *Gomphogyne* (De Wilde et al., 2007), material collected in 2007 and 2010 on a large limestone outcrop in Thailand (Khon Kaen Province) has been distinguished as a new species, *G. stenocarpa*, distinct from all other species by its hairy, narrow, 1- or 2-seeded fruits. At present we recognize eight species in *Gomphogyne*, occurring from the Himalayas east to New Guinea with most of the species occupying rather isolated areas:

1. *Gomphogyne bonii* Gagnep., Bull. Mus. Hist. Nat. (Paris) 24: 372. 1918, p.p., for the lectotype only.

Distribution.— Vietnam (Tonkin); China (Guangxi).

2. *Gomphogyne cirromitrata* W.J.de Wilde & Duyfjes, Thai Forest Bull., Bot. 35: 53. 2007.— *Hemsleya cirromitrata* (W.J.de Wilde & Duyfjes) H.Schaef. & S.S.Renner, Taxon 60: 134. 2011.

Distribution.— Thailand; possibly also Cambodia.

3. *Gomphogyne cissiformis* Griff., Account Bot. Coll. Cantor: 26. 1845.

Distribution.— India (Garheval, Darjeeling, Sikkim); Nepal; Bhutan; China (Yunnan, but no material seen).

4. *Gomphogyne heterosperma* (Wall.) Kurz, J. Asiat. Soc. Bengal 46: 105. 1877.

Distribution.— Thailand; East Myanmar; China (Yunnan, but no material seen).

5. *Gomphogyne longgangensis* (X.X.Chen & D.R.Liang) W.J.de Wilde & Duyfjes, **comb. nov.**— Basionym: *Hemsleya longgangensis* X.X.Chen & D.R.Liang, Acta Bot. Yunnan. 14: 27, fig. 1. 1992. — Type: China, Guangxi, *Chen & Liang 2954* (in Herb. Guangxi Nat. Medical Research Institute, not seen).

Notes.— 1. *Gomphogyne longgangensis*, endemic to Guangxi Province, was placed in the synonymy of *H. graciliflora* by Lu & Jeffrey (2011). However, the species description and figure presented by Chen & Liang (1992) do not allow for this: e.g. the corolla of *G. longgangensis* is 3–4 mm diam. and its seeds have a narrow corky wing; in *H. graciliflora* the corolla is 10–12 mm diam. and its seeds have a hyaline wing. The corolla, however, is mentioned as being yellow, a colour prevalent in the genus *Hemsleya*. See also note 2 under *H. graciliflora* above.

2. *Gomphogyne longgangensis* differs from the related *G. bonii* in having smaller fruits, 2.5–3 cm long (3.5–5 cm long in *G. bonii*).

3. The genus *Gomphogyne*, possibly known from Yunnan through *G. heterosperma* and *G. cissiformis*, is now also known from Guangxi through *G. longgangensis*.

6. *Gomphogyne nepalensis* W.J.de Wilde & Duyfjes, Thai Forest Bull., Bot. 35: 60. 2007.

Distribution.— Nepal (only known from the type).

7. *Gomphogyne peekelii* W.J.de Wilde & Duyfjes, Thai Forest Bull., Bot. 35: 62. 2007.— *Hemsleya peekelii* (W.J.de Wilde & Duyfjes) H.Schaef. & S.S.Renner, Taxon 60: 134. 2011.

Distribution.— Indonesia (Moluccas (Ceram)); Papua (Vogelkop); Papua New Guinea (East New Britain (Gazelle Peninsula); New Ireland.

8. *Gomphogyne stenocarpa* W.J.de Wilde & Duyfjes, **sp. nov.** A congeneribus fructu angusto brevi pubescenti, seminibus 1 vel 2 planis differt. — Type: Thailand, Khon Kaen, Phu Pha Man National Park, *Phonsena 6602* (holotype **BKF**; isotypes **BK, KKKU, L, QBG**). Figs. 2C–E, 3–4.

Annual slender climber, 3 m tall; dioecious; stem 0.5–1 mm thick, glabrous or finely sparsely hairy, especially near the nodes, hairs ca 1 mm long. *Leaves*: petiole 2–3 cm long; petiolules 0.4–0.8 cm long; blade foliolate, 4–6 cm diam.; leaflets membranous, glabrous except minute hairs on main veins, narrowly elliptic, 1.5–4 by 0.5–2.5 cm, base attenuate, margin serrate, apex acute; 4–8 pinnately veined; cystoliths absent. *Male inflorescences* glabrous or sparsely minutely hairy, 5–10 cm long, paniculate, 2- or 3-branched, rather few-flowered; bracts 0.5 mm long, minutely dentate; peduncle 2–3 cm long; rachis ± straight; ultimate spike-like racemes 0.5–1 cm long, few-flowered; flowers creamy-white. *Male flowers* glabrous; pedicel 5–6(–8) mm long, articulated towards the base, persistent portion ca 1 mm long; perianth (see note 2) (7–)10–11 mm diam.; receptacle shallow, 2–2.5 mm diam., inside minutely papillose; sepals long-triangular, 2.5–3 mm long, (0.5–)0.8 mm wide at base, subacute; petals narrowly oblong, 4–4.5 by 1–1.2 mm, subacute, minutely dentate at apex; filaments inserted in the centre of the receptacle, 0.5–0.6 mm long, anthers subelliptic, 0.2–0.3 mm long. *Female inflorescences* a slenderly peduncled 1–3-flowered raceme; peduncle 1.5–2 cm long. *Female flowers*: pedicel slender, 20–25 mm long, with 2 (sub)opposite immature tendrils at apex, each ca 5 mm long; ovary fine-hairy, especially in the lower half, narrow, subcylindrical, 9–11 by 2.5 mm, narrowed in the lower half, apex somewhat narrowed, ca 1 mm wide; sepals narrow, 2–2.5 by

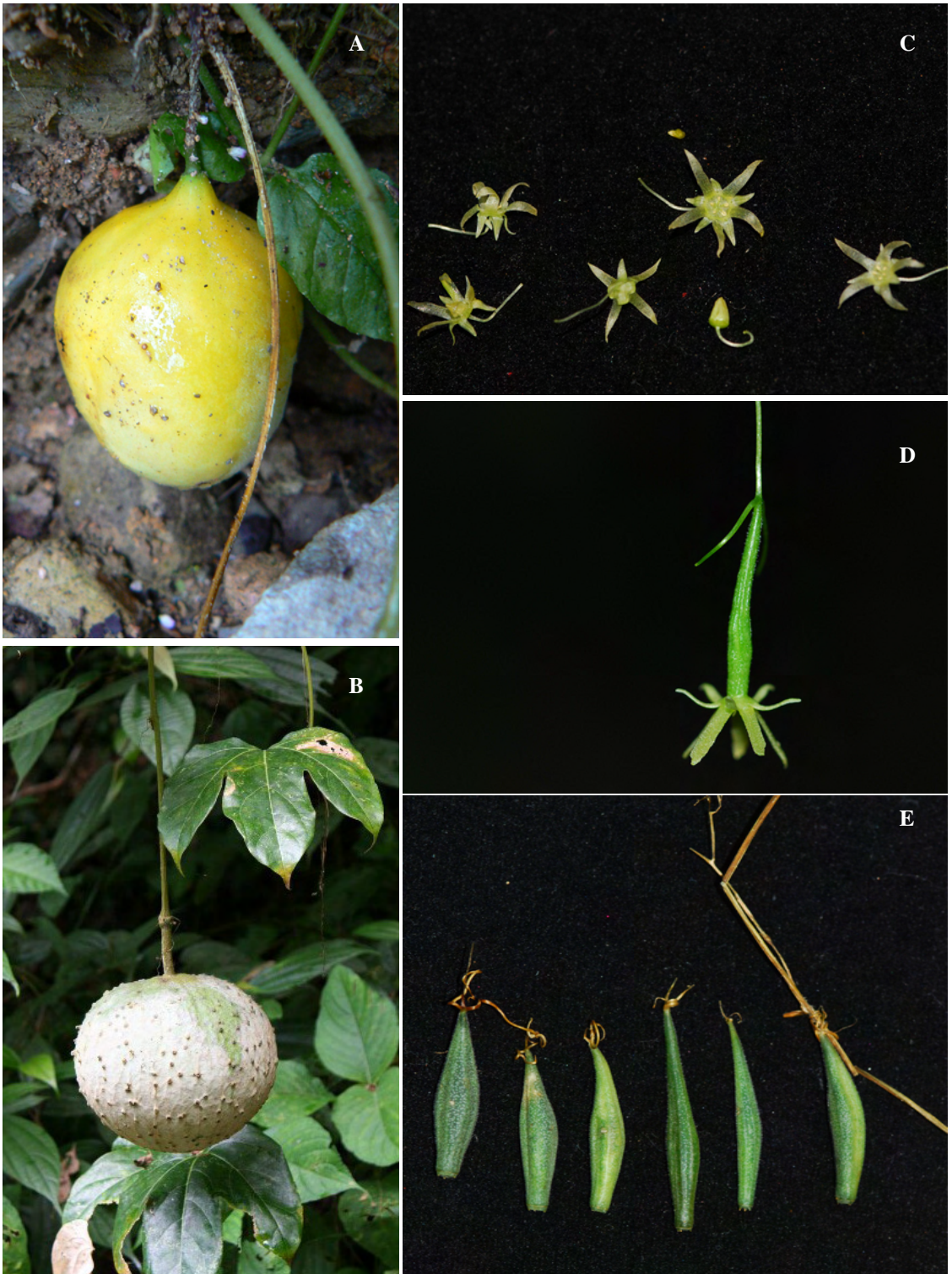


Figure 2. A. *Cucumis debilis*. B. *Hodgsonia heteroclita* (Roxb.) Hook.f & Thomson subsp. *indochinensis* W.J.de Wilde & Duyfjes. C–E. *Gomphogyne stenocarpa* W.J.de Wilde & Duyfjes. Photographed by Z. van Herwijnen (A), T. Temchai (B), P. Phonsena (C–E).

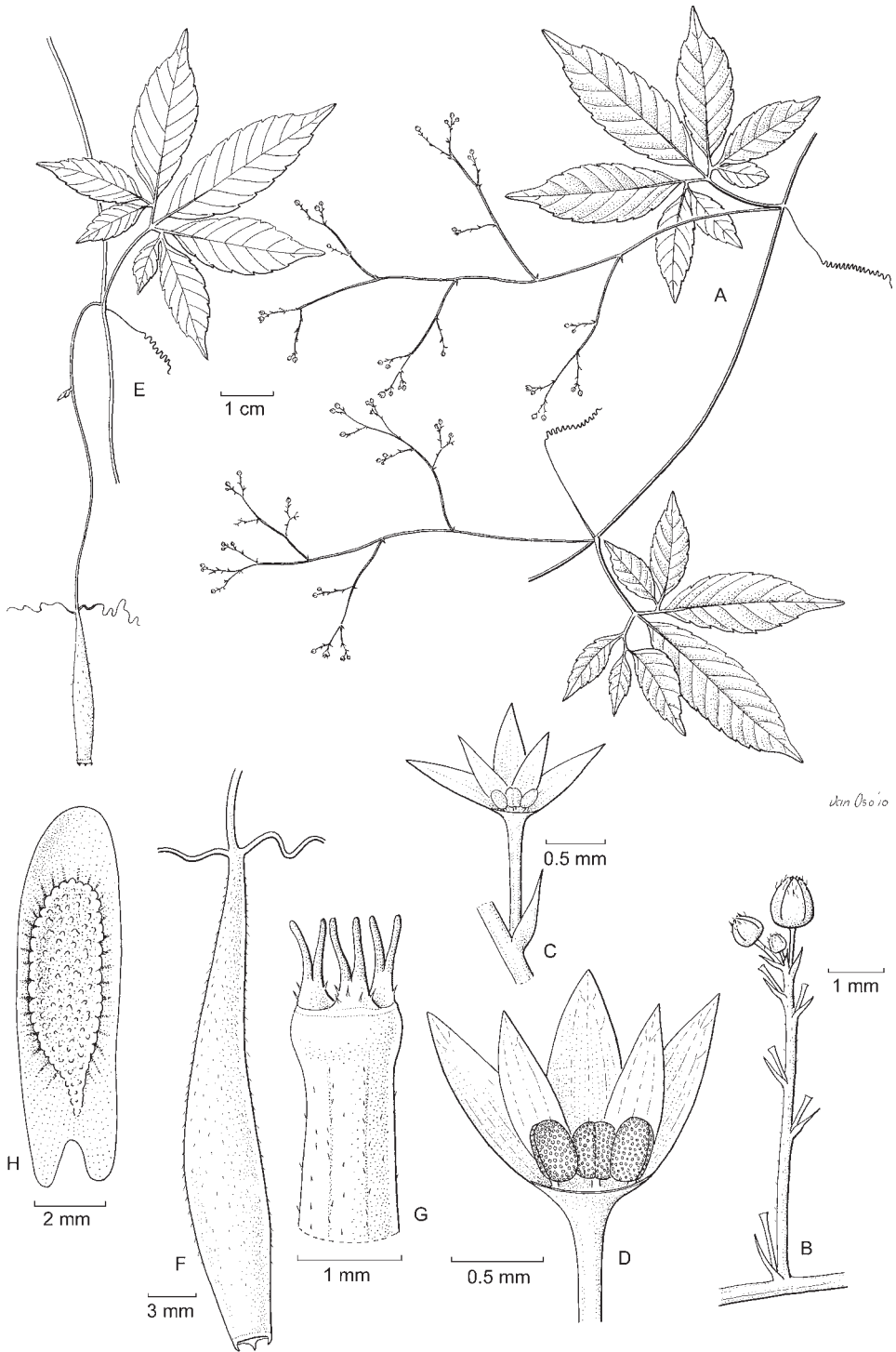


Figure 3. *Gomphogyne stenocarpa* W.J.de Wilde & Duyfjes: A. Portion of twig with male inflorescences; B. detail of male inflorescence; C, D. opened immature male flower; E. node with fruit; F. fruit, note 2 opposite tendrils at base and 3 short blunt horns at base; G. apex of old ovary with 3 stigmas; H. seed (all: Norsaengsri & Lakoet 2806 (QBG)).

0.5 mm, subobtusate; petals oblong, ca 4 mm long, subobtusate; styles including stigma ca 0.7 mm long. *Fruits* solitary; capsule short-hairy, with the shape of the ovary, (2.5–)3–3.5 by 0.4–0.5 cm, faintly longitudinally ribbed, apex 2–3 mm wide, with 3 short blunt horns ca 0.5 mm long; fruiting pedicel 4–6 cm long, the 2 opposite tendrils ca 1.5 cm long and spiraling. *Seeds* dark brown, 1 or 2, situated about the middle of the fruit, elliptic-oblong, flat, 9–12 by 3–4 mm, finely tubercled, woody-winged all around, wing at base deeply notched, ca 4 mm long, at the sides ca 1 mm wide or less, at apex rounded 2–2.5 mm long.

Thailand.— NORTH-EASTERN: Khon Kaen (Phu Pha Man National Park), 15 Nov. 2010, male flower, *Phonsena* 6001 (**BKF, L**); *ibid.*, 15 Nov. 2010, female flower & fruit, *Phonsena* 6002 (**BK, BKF, KKKU, L, QBG**); *ibid.*, 25 Oct. 2007, female flower & fruit, *Norsaengsri & Lakoet* 2806 (**L, QBG**).

Distribution.— Endemic.

Ecology.— Only known from a large limestone outcrop at the type-locality; climber in half open

places in shrubs on rocks with shallow soil in crevices; ca 300 m altitude; flowering October to November; fruiting October to December.

Notes.— 1. The fruit-shape of *Gomphogyne stenocarpa* is similar to that of certain *Hemsleya* species with slender fruits, e.g. to *H. zhejiangensis* C.Z.Zheng, in its contracted fruit apex with short horns. *Hemsleya zhejiangensis* differs from *G. stenocarpa* in growth habit (perennial), much larger fruits, and larger flowers.

2. The seeds of *Gomphogyne stenocarpa* are much too large to be released through the opening at the apex of the fruit; possibly the seeds are freed by the decay of the pericarp.

3. Male flower buds contain anthers with already mature looking pollen.

4. The pollen is much like that of several other *Gomphogyne* species (De Wilde et al., 2007), and that of several other genera in the subfamily Fevilleoideae (Van der Ham et al. 2010), in having striate ornamentation with microstriate muri.

5. Schaefer & Renner (2011b) divide the

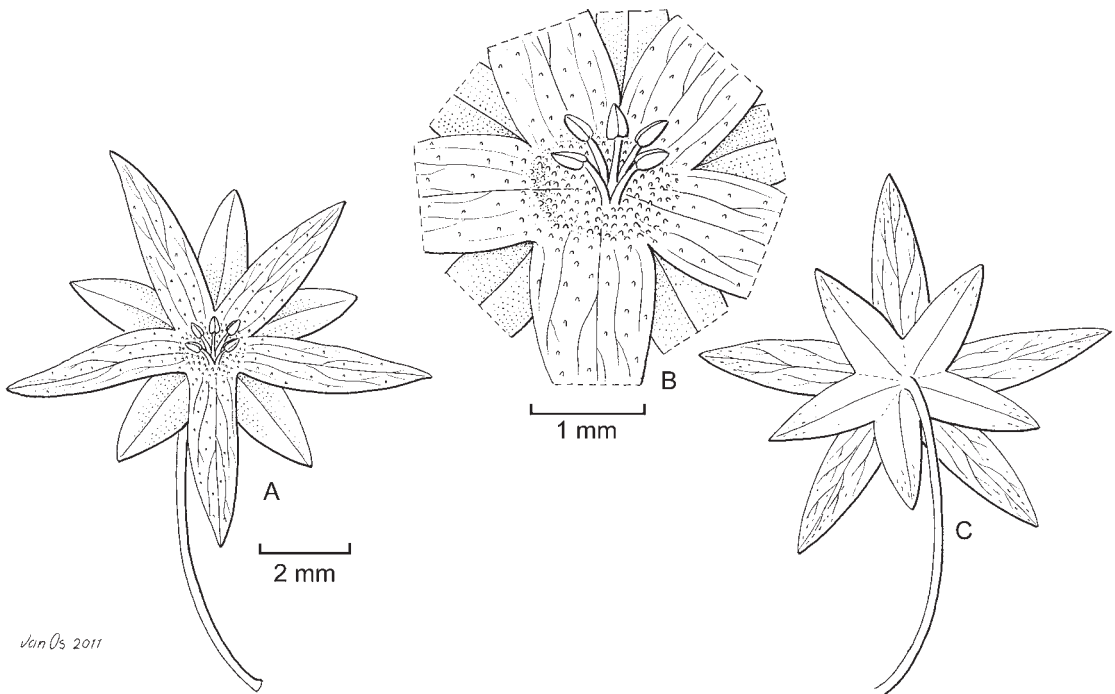


Figure 4. *Gomphogyne stenocarpa* W.J.de Wilde & Duyfjes: Male flower: A. side view; B. detail; C. seen from below (all: *Phonsena* 6602 (L)).

family Cucurbitaceae into 15 tribes, at the same time discarding the division into two subfamilies, arguing that subfamily Fevilleoideae is paraphyletic, and also that the morphological distinction is not sharp. However, they do not mention the differentiating character of the style(s), and also not the pollen arguments in favour of two subfamilies as published by Van der Ham et al. (2010).

(IV) ON THE ANDROECIUM AND POLLEN MORPHOLOGY OF *HODGSONIA HETEROCLITA* (ROXB.) HOOK.F & THOMSON SUBSP. *INDOCHINENSIS* W.J.DE WILDE & DUYFJES

The genus *Hodgsonia*, for a long time regarded as monotypic, contains two species: *H. heteroclita* with a northerly distribution and *H. macrocarpa* (Blume) Cogn. with a distribution in Thailand south of the Isthmus of Kra and in Peninsular Malaysia, West Java, and Borneo (De Wilde & Duyfjes, 2001). The species are distinct in numerous morphological characters, but recent findings also suggest that their pollination agent may be different. Both species flower at night, as in most *Trichosanthes* species. For *Trichosanthes* it is assumed that pollination is by night moths, e.g. those in the genus *Sphinx*, and likely this also holds true for *Hodgsonia macrocarpa*.

In the genus *Trichosanthes* and in *Hodgsonia macrocarpa* the synandrium is elongate and included in the hypanthium-tube. During and after anthesis the synandrium remains included within the hypanthium-tube and the (male) flower remains actinomorphic.

In *Hodgsonia heteroclita* subsp. *indochinensis*, however, the synandrium is subglobose or half-globose, situated in or just above the throat of the hypanthium-tube, which broadens into a shallow cup- or saucer-shaped part at the apex and is demarcated from the long and narrow lower part of the tube. At anthesis the pollen, which is around the same size as the pollen of *H. macrocarpa*, is well-exposed and apparently agglutinates in sticky(?) threads. Corollas found on the ground in the early morning seem to be somewhat damaged by nightly visits of pollinators, allegedly pollen-eating bats, although this has never been observed. In those fallen corollas seen in Thailand and in Vietnam we observed that the synandrium, still containing a

part of the pollen grains, appeared to be higher in the tube, above the saucer-shaped throat, by a stretching of the filaments. In addition the synandrium had become more depressed and in an oblique position due to one of the filaments being stretched more than the two others, rendering the corolla somewhat zygomorphous. The large white flowers with spreading corolla-lobes, with long, pendent, spiraling and densely brown hairy, appendages, presumably attract nightly visitors. In mature buds, the petal appendages are hardly to be seen, and apparently these develop at the 'last minute' with the opening of the flower shortly after dark, possibly carrying some pollen grains for better exposure. It would be interesting to know what actually happens with these flowers at night, which unfortunately grow high-up in the forest vegetation, and are found shed on the forest floor in the morning.

Slightly zygomorphous flowers in Cucurbitaceae otherwise occur in Asia only in the tribes *Momordiceae*, *Siraitieae*, and *Thladiantheae* (tribes defined by Schaefer & Renner, 2011b).

The big fruit of *Hodgsonia heteroclita* is described as smooth or grooved, but we recently saw a photo of a fruit, apparently of this species, which was (as an exception?) rather densely warty. Fig. 2B.

Pollen morphology of *Hodgsonia*

Pollen grains of *Hodgsonia heteroclita* and *H. macrocarpa* are large to very large. There is not much difference between the species with regard to pollen size and shape: P x E (length polar axis x equatorial diameter) = 94–119 x 102–125 µm (P/E = 0.86–0.95) and 98–112 x 100–111 µm (P/E = 0.94–1.07), respectively (five pollen grains measured per sample). However, exine ornamentation is clearly different: in *H. heteroclita* it is coarsely reticulate, with the largest lumina (15–20 µm) in the equatorial zone and the smallest on the poles (Figs. 5A–C), but in *H. macrocarpa* it is more finely reticulate, with the largest lumina (5–6 µm) towards the poles and the smallest in the equatorial zone and along the apertures (Figs. 5D–F).

The occurrence of the coarsely reticulate ornamentation type in *H. heteroclita* has already been described (e.g. Khunwasi, 1998, sub *H. macrocarpa*), but the finer reticulate type of *H.*

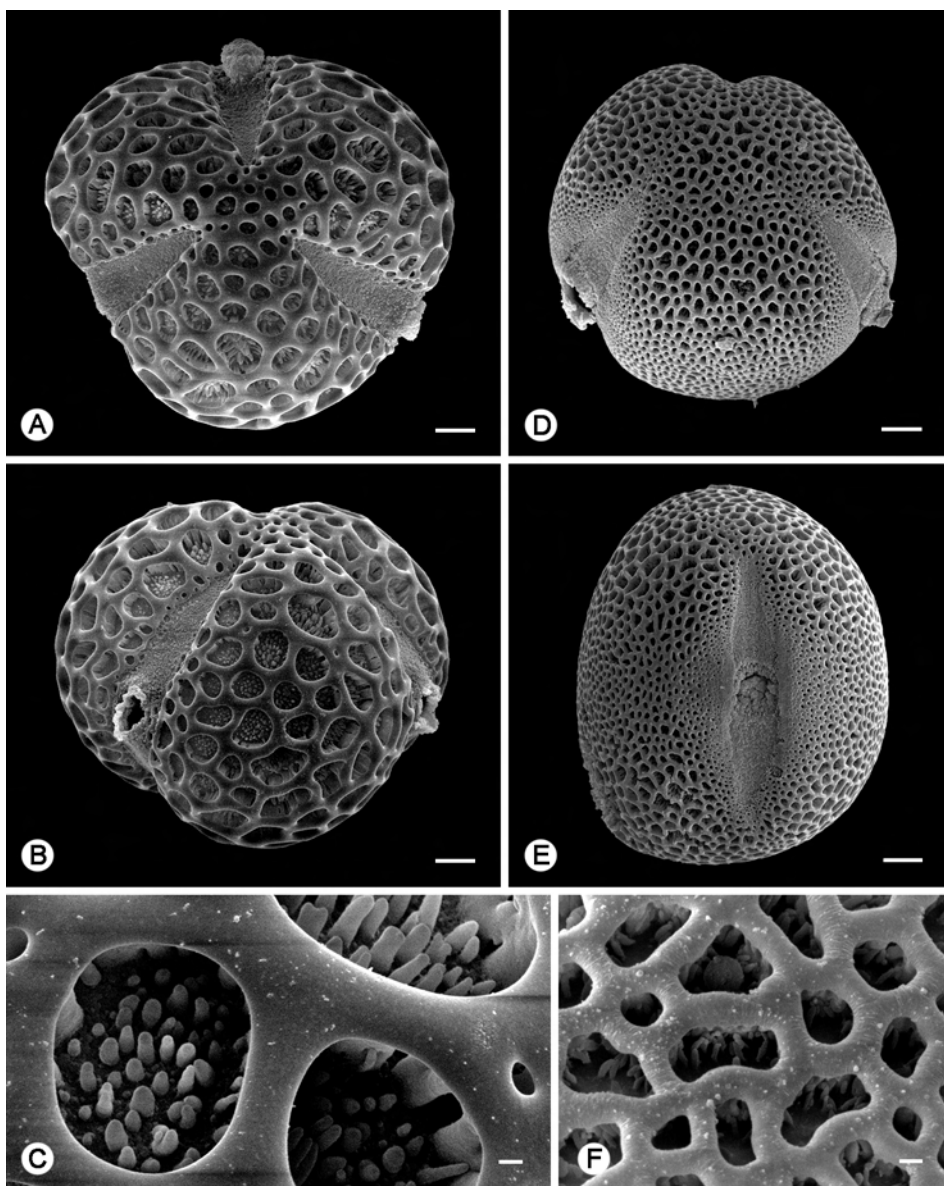


Figure 5. Scanning electron micrographs of pollen grains of *Hodgsonia heteroclita* (Roxb.) Hook.f & Thomson (A–C: Piyakaset *et al. s.n.*) and *H. macrocarpa* (Blume) Cogn. (D–F: SAN 143972). A, D: \pm polar views; B, E: \pm equatorial views; C, F: details of ornamentation. Scale bar 10 μ m (A, B, D, E) or 1 μ m (C, F).

macrocarpa was previously unknown. Although the contrast in ornamentation between the species is not characteristic for bat pollinated plants versus non-bat pollinated relatives (Stroo, 2000), it might reflect different pollination syndromes (bat pollination versus moth pollination, respectively) within *Hodgsonia*.

Material studied: *Hodgsonia heteroclita*: N. Vietnam: De Wilde & Duyffjes 22349 (L); Thailand: Suksathan *et al. s.n.* (L); *H. macrocarpa*: Malaysia: Sarawak, Richards 2541 (L), Sabah, De Wilde *et al. SAN 143972* (L).

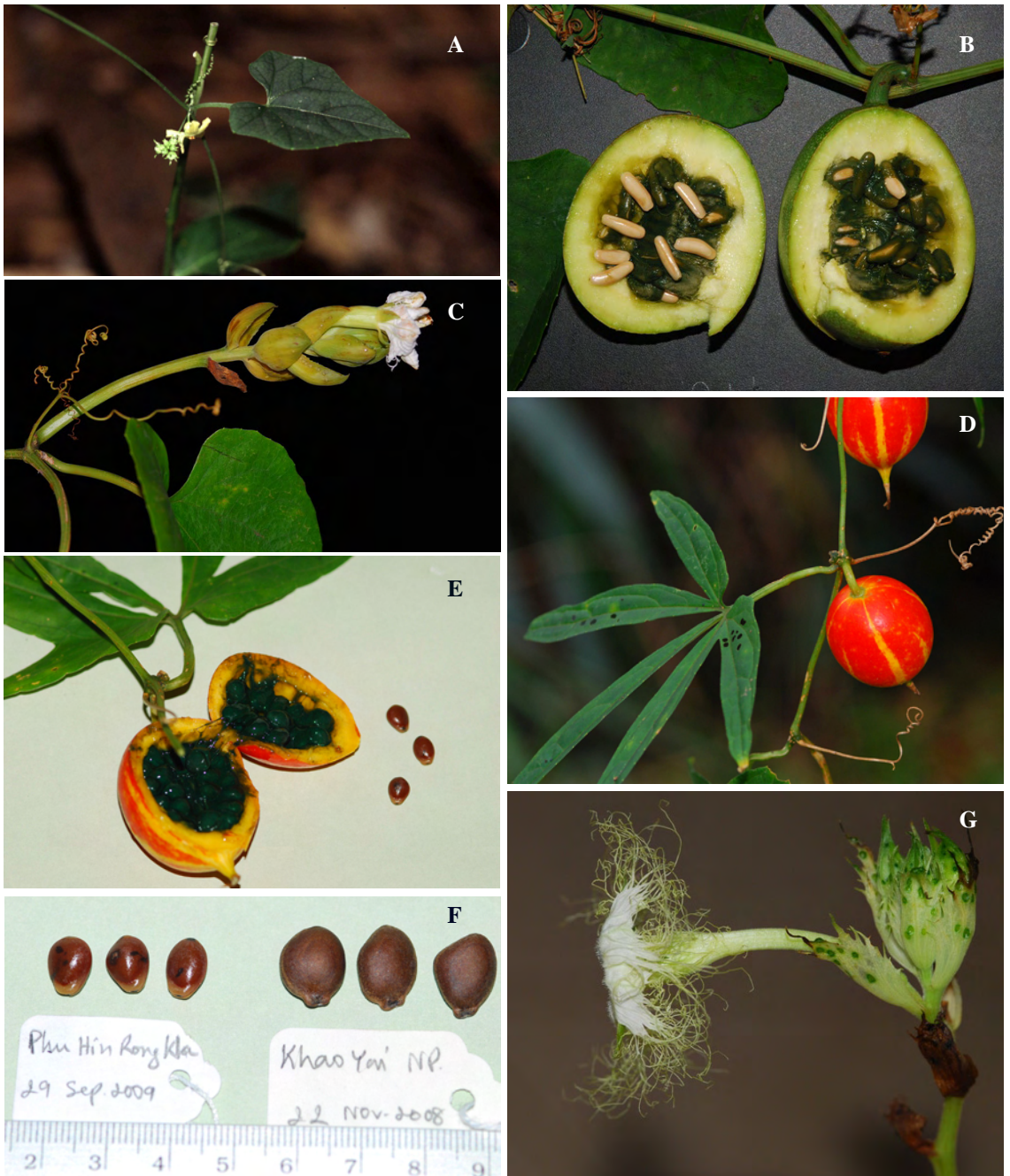


Figure 6. A. *Indomelothria blumei* W.J.de Wilde & Duyfjes. B–C. *Trichosanthes dolichospermum* Duyfjes & Pruesapan. D–F. *Trichosanthes pedata* Merr. G. *Trichosanthes tricuspidata* Lour. subsp. *rotundata* W.J.de Wilde & Duyfjes. Photographed by B. Chanatarasuwan (A), P. Phonsena (B–G).

(V) *INDOMELOTHRIA BLUMEI* W.J.DE WILDE & DUYFJES, SEEN IN THAILAND AGAIN

Flowering specimens of *Indomelothria blumei* were photographed (but not collected) in Khao Ang Ruenai Wildlife Sanctuary (South-Eastern region). This widespread but rare or apparently easily overlooked species was last collected in 1926 by Collins (*Collins 1357*) in Sriracha (Chon Buri in the South-Eastern region); see also De Wilde & Duyfjes (2008: Fig. 6A).

(VI) *SINOBAIJIANIA C.JEFFREY & W.J.DE WILDE: A NEW VARIETY*

Recently the collection *Chongko 510* from Mahidol University, Kanchanaburi Campus, came to our attention. It appeared to be identical to the specimen *Put 18*, which was discussed in a note under *Sinobaijiania smitinandii* W.J.de Wilde & Duyfjes (De Wilde & Duyfjes, 2006), and to plate 38:2 in the *Flora of Thailand* (De Wilde & Duyfjes, 2008), attributed in the text to *S. smitinandii*. This photo and the collections *Put 18* and *Chongko 510* represent a new taxon, here described as a variety.

***Sinobaijiania smitinandii* W.J.de Wilde & Duyfjes var. *laxa* W.J.de Wilde & Duyfjes, var. nov.** A varietate typica inflorescentiis masculinis habitu laxiore, bracteis minoribus 2–5 mm longis, floribus parum minoribus, sepalis expansis latioribus apice fere rotundatis (non acuto-acuminatis) differt.— Type: Thailand, Kanchanaburi, Mahidol University, Kanchanaburi Campus, *Chongko 510* (holotype **BKF**; isotypes **A** (not seen), **CAS** (not seen), **CMU** (not seen), **L**, **MO** (not seen)).

Herbaceous climber, ca 2 m high, growing annually from a perennial tuber of unknown size; leafy stem ca 1.5 mm thick. *Leaf margin* finely or rather coarsely serrate (teeth to 3 mm long). *Male inflorescences* racemose or paniculate with 2 (or 3) branches; peduncle slender, 1–4 cm long; flowers 5–10, crowded; bracts narrowly obovate, (2–)3–5 by 2–3 mm. *Male flowers*: pedicel 5–10 mm long; sepals patent (spreading), ovate, 4–5 by 2–3 mm, broadly (sub) obtuse, 3-veined; petals 5–7 mm long; stamens 4 or 5, anthers ± curved, 1.5–2.5 mm long. *Female flowers* and fruits not known.

Thailand.— SOUTH-WESTERN: Kanchanaburi

[Mahidol University, Kanchanaburi Campus, male flowers, 15 May 2006, *Chongko 510* (**BKF**, **L**); Ta Taklua, male flowers, 25 June 1926, *Put 18* (**BM**, **E**, **K**)].

Distribution.— Endemic.

Ecology.— In degraded deciduous hardwood forest with bamboo on rugged limestone; at ca 200 m altitude; flowers yellow; flowering in May and June.

(VII) THE FRUIT OF *THLADIANTHA HOOKERI* C.B.CLARKE AND *THLADIANTHA INDOCHINENSIS* MERR.

1. *Thladiantha hookeri* C.B.Clarke in Hook.f., Fl. Brit. India 2: 631. 1879.— Type: Khasia, *Hooker & Thomson 1703* (lectotype **K**, designated by De Wilde & Duyfjes, 2006). Fig. 7A.

In previous publications (De Wilde & Duyfjes, 2006, 2008) the fruit of *T. hookeri* was not known for Thailand. A fruiting collection *Munthipha Kamphio s.n.* (L) from Khun Kon Waterfall, Chiang Rai, provided the first fruits known for Thailand enabling the following description.

Fruits solitary on the nodes, ripening greenish yellow(?), narrowly ovoid, 4(–4.5) by 2–2.3 cm, base broadly rounded, apex acute-acuminate, 10–13 mm beaked, glabrescent from weak minute hairs 0.5 mm long or less, hairs subpersistent at very base and apex; pulp whitish, firm but almost absent; fruiting pedicel filiform, 2.5–3 cm long, ca 0.3 mm thick. Seeds numerous, pale creamy-brown, moderately compressed, broadly ovoid (subcircular), ca 6 by 5.5 by 3 mm, base truncate, apex rounded, smooth (extremely finely rugose), margin absent, edge smooth.

Notes.— The fruit was described by Lu & Jeffrey (2011) as 4–6 by 2–3 cm and the seeds as 6–7 by ca 5 mm, and by Keraudren (1975) as 3–3.5 cm long and the seeds as 6.5 by 5 by 2.5 mm.

2. *Thladiantha indochinensis* Merr., J. Arnold Arbor. 21: 386. 1940.— Type: N Vietnam, Chapa, *Pélot 2194* (lectotype **GH**, designated by Jeffrey, 1980). Fig. 7B.

This species was described from two male specimens collected by Pélot in N Vietnam. Later (De Wilde & Duyfjes 2006, 2008) the description

was extended through a collection by Vidal 5175 (male and female flowers) made in N Thailand (Doi Chiang Dao). In December 2009 a specimen with female flowers and fruit (*Phonsena*, Duyfjes & De Wilde 6511) was collected in N Thailand (Doi Ang Khang, near Fang, at 1,280 m altitude), and the description of the fruit is as follows:

Fruits solitary on the nodes, green but paler towards the apex, with few hairs (as on the ovary), largely glabrous, subglobose, ca 2.5 cm diam., ca 5 mm beaked, somewhat bulging between 8 shallow grooves; fruiting pedicel 5–6 mm long, ca 2 mm thick. *Seeds* ca 8 by 6 by 2.5 mm, base truncate, apex rounded, smooth (extremely finely rugose), margin absent, edge smooth

(VIII) ADDITIONS TO *TRICHOSANTHES* IN THAILAND, LAOS AND VIETNAM

Since the revision of *Trichosanthes* in Thailand (Duyfjes & Pruesapan, 2004) (17 species) and the treatment in the *Flora of Thailand* (De Wilde & Duyfjes, 2008) (17 species), two more species, *T. baviensis* Gagnep. and *T. pedata* Merr., and one

new subspecies, *T. tricuspidata* Lour. subsp. *rotundata* W.J.de Wilde & Duyfjes have been found in Thailand. Moreover, in *T. dolichospermum* a male plant has been found for the first time. Furthermore, specimens in the Paris herbarium, not treated by Keraudren (1975), have been matched to recent *Trichosanthes* collections from HN (Hanoi) and named as *Trichosanthes fissibracteata* C.Y.Cheng & Yueh. Keys (male and female flowering, and fruiting specimens) to all *Trichosanthes* species for Cambodia, Laos, Vietnam, and Thailand are in preparation.

In the following account descriptions and additions for Thailand and Vietnam are given.

1. *Trichosanthes baviensis* Gagnep., Bull. Mus. Natl. Hist. Nat. 24: 379. 1918; Keraudren in Aubrév. & J.-F. Leroy, Fl. Cambodge, Laos & Vietnam 15: 88. 1975; S.K. Chen in C.Y. Wu, C. Chen & S.K. Chen, Fl. Yunnan. 6: 374, pl. 97: 1–5. 1995; L.Q. Huang & C. Jeffrey in A.M. Lu & C. Jeffrey, Fl. China: species no. 30. 2011.— Type: Vietnam, Tonkin, *Balansa* 4016 (holotype **P**). Figs. 8–9.

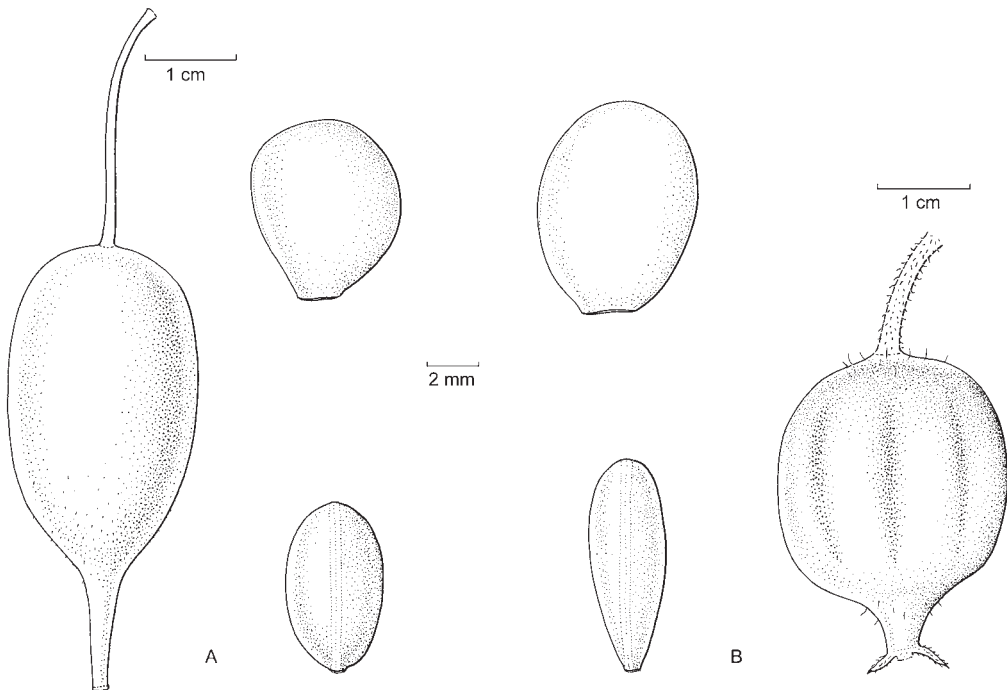


Figure 7. Fruit and seed seen from above and laterally. A. *Thladiantha hookeri* C.B.Clarke; B. *Thladiantha indochinensis* Merr. (A: *Kamphio* s.n. (L, L0585294), B: *Phonsena*, De Wilde & Duyfjes 6511 (L)).

Perennial(?) climber, 3–5 m long, green on drying, minutely gland-hairy, hairs 0.1–0.2 mm long; cystoliths not obvious; leafy stem 2–3 mm diameter; dioecious. *Probracts* absent. *Tendrils* 2- (or 3)-branched. *Leaves*: petiole (3–)4–9 cm long; blade membranous, simple, unlobed, minutely (gland-)hairy on both surfaces, glands absent, broadly ovate, (5–)7–20 by 5–14.5 cm, base cordate with rather narrow sinus, margin entire, apex acute-acuminate. *Male inflorescences* a corymb-like 2–3(–5) cm long condensed 10–20-flowered raceme, sometimes with a single flower co-axillary; peduncle

ca 0.5 cm long, ca 1.5 mm thick; bracts absent. *Male flowers*: pedicel 10–20 mm long; receptacle-tube narrowly cup-shaped, 3–4 mm long, at apex ca 3.5 mm diam.; sepals narrowly triangular, 2–3 mm long, ca 1 mm wide at base, margin entire; petals (folded in hemi-globose bud) broadly rounded at apex, 3(–4) mm diam.; synandrium and filaments not seen. *Female flowers* not known. *Fruits* ripening orange-red, pale-striped, ovoid-ellipsoid, 3 cm long. *Seeds* tumid (swollen) with a broad belt, ca 7 by 7 by 3 mm.

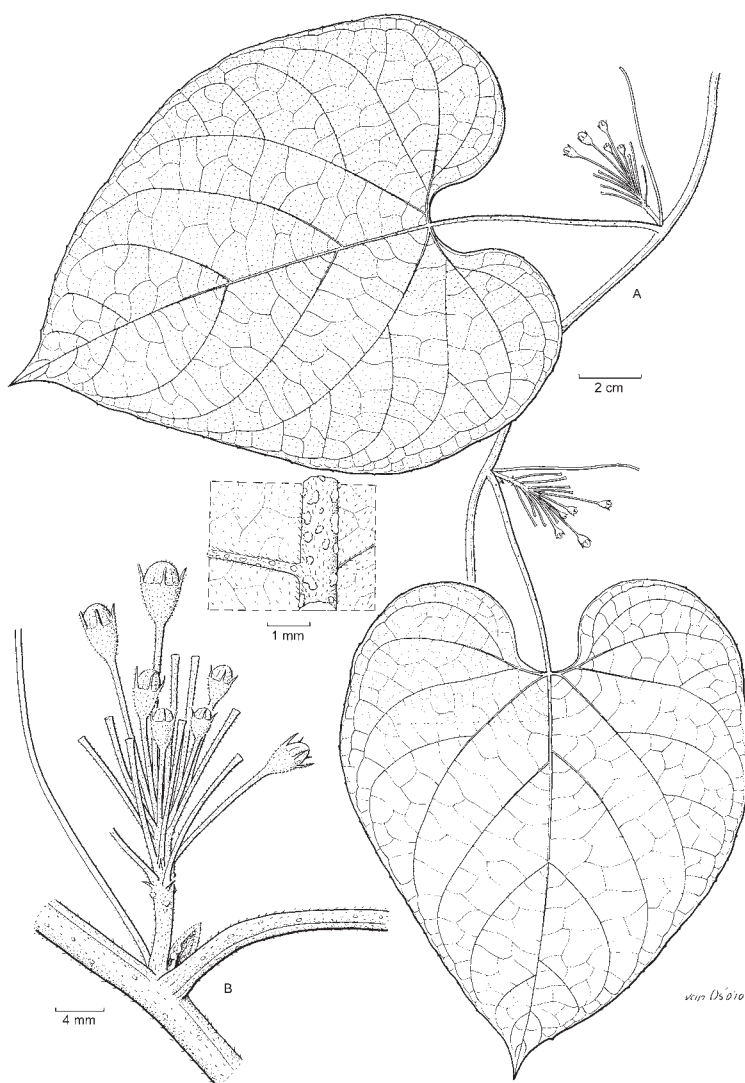


Figure 8. *Trichosanthes baviensis* Gagnep.: A. Portion of twig with male inflorescences (buds) with detail of lower leaf surface, note glandular hairs; B. node with male inflorescence (buds); (all: Maxwell 06-743 (QBG)).

Thailand.— NORTHERN: Chiang Mai [Doi Chiang Dao, 10 July 1998, fruit, *Suksathan 1124* (QBG)]; Chiang Rai [Doi Tung, 25 May 2006, fruit, *Maxwell 06-336* (L)]; Mae Sai district, 21 Oct. 2006, male flower, *Maxwell 06-743* (QBG)].

Distribution.— Myanmar (*MacGregor 564* (E)); Vietnam (Tonkin, June 1887 *Balansa 4016* (P)); Cuc Phuong National Park, 20 Nov. 2000, *Cuong et al. 1248* (P)).

Ecology.— Recorded as an annual vine; on limestone; between 400 and 1600 m altitude.

Notes.— 1. *Trichosanthes baviensis* is similar to *T. pilosa* Lour., both species having tumid (swollen) and “3-parted” seeds. *Trichosanthes pilosa* is very variable, but distinct e.g. in a much longer male raceme, with bracteate flowers.

2. In Gagnepain (1918) the tendrils are described as 2-branched, the leaves as glabrous

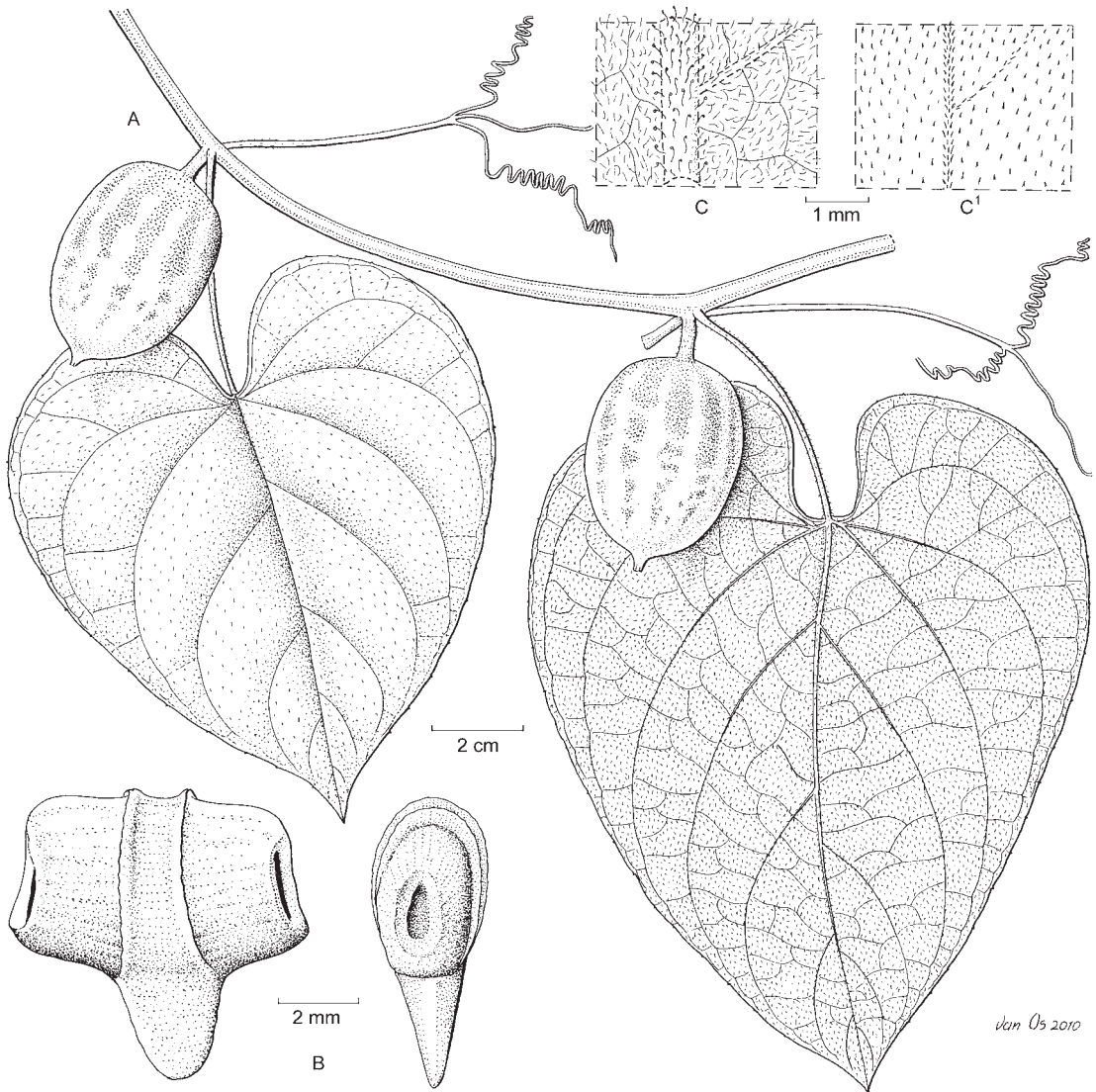


Figure 9. *Trichosanthes baviensis* Gagnep.: A. Portion of fruiting twig; B. seed seen from above and laterally; C–C'. detail of lower and upper leaf surface respectively (A, C–C': *Suksathan 1124* (QBG); D: *Maxwell 06-336* (L)).

above, the male petals as 17–20 mm long (including the fringes), the anthers as S-shaped, the synandrium as coherent, truncate, ca 2 mm long; all based on the type specimen, *Balansa 4016* (P), from Tonkin.

3. Lu & Jeffrey (2011) described the female flower as follows: “solitary, pedicel ca 7 mm, pubescent, ovary oblong, 8–10 mm, densely pubescent”, the fruit “ovoid, 3.5–5 by ca 3.5 cm, smooth, glabrous, beaked”, but the seeds are recorded as unknown.

2. *Trichosanthes dolichosperma* Duyfjes & Pruesapan, Thai Forest Bull., Bot. 32: 84, fig. 1b. 2004.— Type: Thailand, Phetchabun, *Shimizu et al. T-11779* (holotype **BKF**; isotype **L**). Figs. 6B–C.

This species, described in 2004, was only known from the type, with fruit, from Phu Pha Man National Park (Khon Kaen). It is now known from the same locality with male inflorescences and ripe fruits.

Male inflorescences rather stout, 13–16 cm long, minutely grey-brown hairy, glabrescent; peduncle ca 10 cm long, 4(–5) mm thick, rachis not thickened, with 5–10 flowers; bracts persistent, broadly elliptic(–obovate), 35–40 by 25 mm, margin shallowly dentate or subentire, apex broadly subacute, glands numerous, small, scattered. *Male flowers* (mature bud) minutely pale brown hairy, hairs 0.1 mm long; pedicel 1–2 mm long; receptacle-tube ca 40 mm long, dilated in upper half, at throat 7(–8) mm wide; sepals long-triangular, ca 15 mm long, ca 4 mm wide at base, margin with a few short side-lobes less than 1 mm long, apex acute; petals white, wedge-shaped, 20–25 mm long; synandrium not investigated. *Fruits* green, somewhat lighter speckled, ripening red, (depressed-)globose or slightly ovoid, ca 7 cm diam. *Seeds* numerous, light brown.

Thailand.— NORTH-EASTERN: Khon Kaen [Phu Pha Man National Park, 24 June 2008, male flower, fruit, *Norsaengsri & Lakoet 3898* (QBG (QBG 36207)); *ibid.*, 5 Sept. 2010, male flower, *Phonsena & Boonsuk 6550* (**BKF, L**); *ibid.*, 5 Sept. 2010, fruit, *Phonsena & Boonsuk 6551* (**BKF, L**)].

3. *Trichosanthes erosa* Duyfjes & Pruesapan, Thai Forest Bull., Bot. 32: 85, fig. 1d. 2004.

— Type: Thailand, Ratchaburi, *Niyomdham 4485* (holotype **BKF**).

This species was described on a fruiting specimen (the type, from Ratchaburi, Thailand) and a male flowering collection from N Vietnam. A male plant of *Trichosanthes erosa* var. *integra* W.J.de Wilde & Duyfjes has now become known from Phetchaburi, Kaeng Krachan National Park (*Phonsena & Chusithong 6083*) and the male bracts appear to be slightly different to how they were originally described: they are larger, 30–35 by 15 mm, and in the upper half finely shortly toothed, the teeth (lacinations) are (0.5)1–2 mm long (not entire as in *T. erosa* var. *erosa*).

4. *Trichosanthes fissibracteata* C.Y.Wu ex C.Y.Cheng & Yueh, Acta Phytotax. Sin. 12: 438. 1974; C.Jeffrey, The Cucurbitaceae of Eastern Asia: 39. 1980.— Type: China, Yunnan, *Hu Xue Ying 6002464* (Herb. Yunnan Prov., Medical Products Res. Institute, not seen).

Climber 5(–10) m long, subglabrous; plant dull blackish grey on drying; leafy stem 3–5 mm diam. *Probract* membranous, linear, 1–3 cm long. *Tendrils* (2- or) 3-branched. *Leaves*: petiole 5–8 cm long; blade thinly membranous, upper surface blackish green, lower surface conspicuously light grey-green on drying, finely or coarsely scabrous above with cystoliths, glands large, few, scattered, in basal half, (2–)3 mm diam., unlobed or shallowly or deeply 3–5-lobed, subcircular in outline, 12–20 by 10–16 cm, base deeply and narrowly cordate, margin entire, apex acute-acuminate. *Male inflorescences* (15–)20–25 cm long, subglabrous; peduncle 10–17 cm long, 3–4 mm thick; rachis short, 3–5-flowered; bracts persistent, minutely hairy, obovate or subtruncate, (20–)30 by 20 mm, without glands, the margin of the upper two thirds with numerous slender threads 10–20 mm long. *Male flowers*: pedicel 1(–2) mm long; receptacle tube 40–50 mm long, abruptly broadened in upper third, at apex (2–)10 mm diam.; sepals narrowly triangular, 10–12 mm long, at base 4–6 mm wide, margin finely lacinate for 1–2 mm; petals obtriangular, ca 20 mm long, lacinate; synandrium not investigated. *Female flowers* not seen. *Fruits* ripening red(?), not flamed or banded, broadly ovoid-ellipsoid, 9–10 by 7–8 cm, apex rounded, not beaked; exocarp

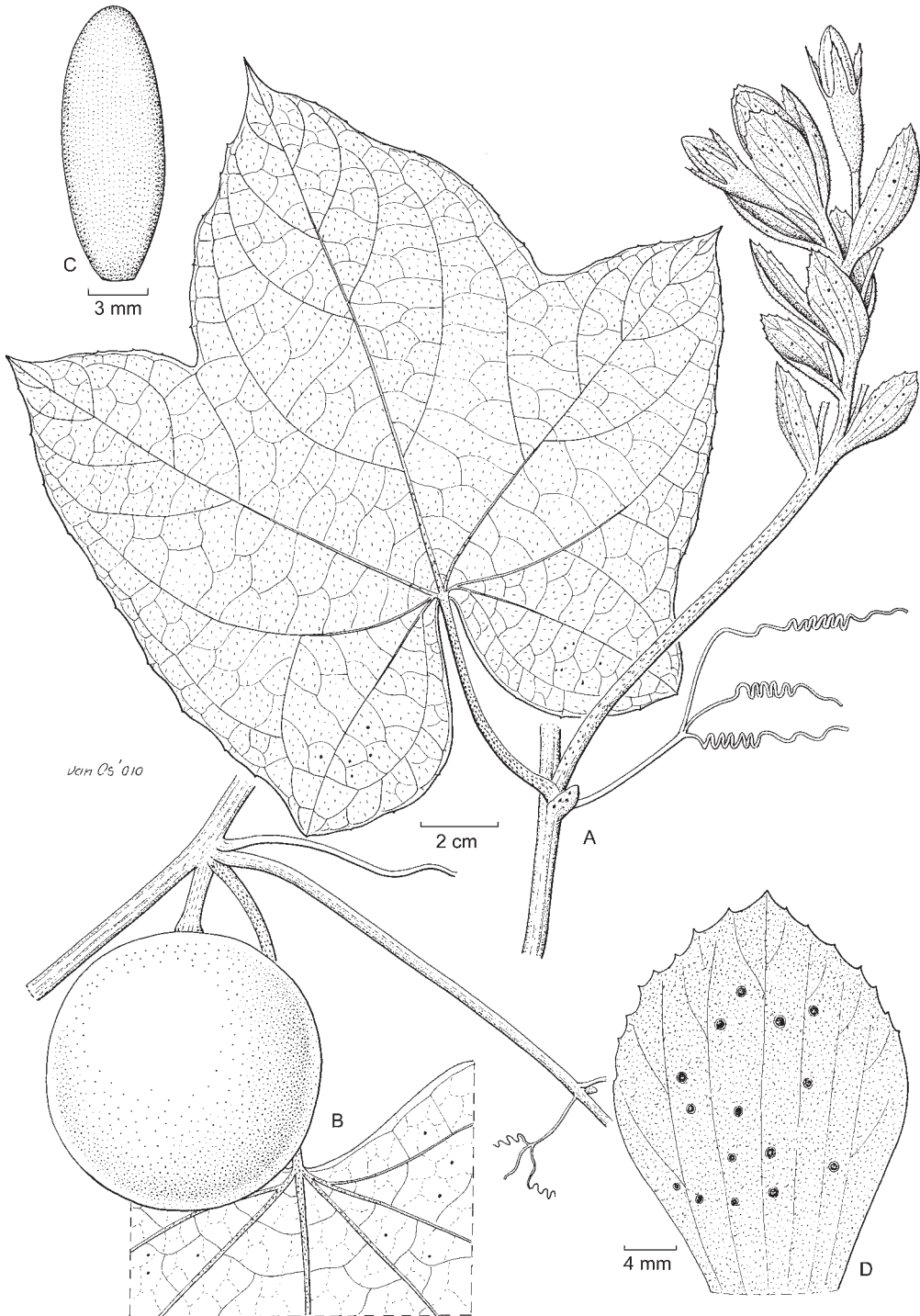


Figure 10. *Trichosanthes dolichosperma* Duyfjes & Pruesapan: A. Node with male inflorescence; B. node with fruit; C. seed; D. male bract (A, D: Phonsena & Boonsook 6550 (L); B–C: Phonsena & Boonsook 6550 (L)).

firm, smooth; pulp not seen (but apparently not green-black); fruiting pedicel 8–10 cm long, ca 5 mm thick. *Seeds* numerous, compressed, pale (grey-)brown, subtruncate or shallowly notched at both ends, grooved in the middle, 12–16 by 6–8 by 3–4 mm, margin broad.

Distribution.— China: Yunnan [Xichou District, 22 July 1982, *Yu, Che & Wu, Quan-An 974 (KUN)*]; Laos: col Barthélémy, from Vinh to Tran Ninh, 1000 m, *Poilane 16778 (P)*; Vietnam: Phu Tho, April 1823, *Pételot 1084 (P)*; Yên Bái, *Lecomte & Finet 619 (P)*; massif of Dong Ché, 23 May 1924, *Poilane 11304 (P)*; without locality, fide Jeffrey, 1980: *Pételot 1723* (not found in **P**).

Ecology.— Forest edges and mountain slopes, at 400–1600 m altitude.

Notes.— The Hanoi herbarium (HN) harbours several fruiting and male flowering collections of *T. fissibracteata* from northern Vietnam. Due to lack of time during the herbarium visit no locality details could be collected.

5. *Trichosanthes pedata* Merr. & Chun, Sunyatsenia 2: 20, fig. 3. 1934; Hand-Mazz., Symb. Sin 7: 1065. 1936, descr. ampl.— Type: China, Kwantung [Guangdong], *Tso 23625* (holotype **SYS**, not seen; isotype **NY**, photo seen).— *Trichosanthes pedata* Merr. & Chun var. *yunnanensis* C.Y.Cheng & C.H.Yueh, Acta Phytotax. Sin. 12: 445. 1974; Keraudren in Aubrév. & J.-F. Leroy, Fl. Cambodge, Laos & Vietnam 15: 91. 1975.— Type: China, *Yueh et al. 70-500* (not seen). Figs. 6D–F.

Climber 3–5 m long, green on drying, glabrous (at first with minute hairs), cystoliths minute; leafy stem 1–2 mm thick. *Probract* subcircular or obovate, 2–3 mm long, with few glands. *Tendrils* simple or 2-branched. *Leaves*: petiole 1.5–6 cm long; petiolules 0.2–0.5(–1) cm long; blade 3- or 5- (or in China 7-) foliolate, subcircular in outline, 10–20 cm diam., margin remotely dentate or entire, in outer leaflets sometimes shallowly lobed towards base, apex acute; middle leaflet(s) narrowly elliptic (5–)7–15 by 1–4.5 cm, base and apex gradually narrowed; lateral leaflets shorter, unequal-sided; glands few, to 1 mm diam., scattered. *Male inflorescences* sparsely minutely hairy, 10–15 cm long; peduncle (1–)2.5–7 cm long, 1.5–2 mm thick; rachis 3–8(–14) cm long, with 5–10 flowers; bracts subpersistent,

narrowly elliptic-obovate, 10–20 mm long, margin shallowly to deeply incised into few lobes, 2–6 mm long, glands present. *Male flowers*: pedicel 1–3 mm long; receptacle-tube 20–25 mm long, the lower portion narrow (pedicel-like), at throat 5–6 mm wide; sepals narrowly triangular, ca 5 mm long, margin entire, apex slender; expanded petals and mature synandrium not seen. *Female flowers* not seen. *Fruits* (after *Phonsena, Duyffjes & De Wilde 6343*) ripening orange-red with 6 broad paler streaks, ovoid, 6–7 by 4–4.5 cm, apex ca 1 mm beaked; fresh pericarp ca 5 mm thick; exocarp leathery; pulp greenish-blackish, bitter; fruiting pedicel 1–1.5(–3 (China)) cm long, 2–3 mm thick. *Seeds* numerous, dark brown, rather thick (only little compressed), broadly elliptic in outline, either 9–12 by ca 5 by 7–8 mm (*Phonsena, Duyffjes & De Wilde 6343*) or 14–15 by ca 5 by 9–10 mm (*Newman et al. LAO 910*, Laos (see note 3)), base faintly truncate, apex rounded.

Thailand.— NORTHERN: Phitsanulok [Phu Hin Rong Kla National Park, 14 June 2009, male flower, *Phonsena 6386 (BK, BKF, K, KKU, L, QBG)*; *ibid.*, 6 Dec. 2009, fruit, *Phonsena, Duyffjes & De Wilde 6482 (BKF, L)*; *ibid.*, 17 Dec. 2009, fruit, *Phonsena, Duyffjes & De Wilde 6528 (BKF, L)*; *ibid.*, 12 Sept. 2010, male flower, *Phonsena & Boonsuk 6555 (BK, BKF, K, L)*; *ibid.*, 12 Sept. 2010, sterile, *Phonsena & Boonsuk 6556 (BKF, L)*]; CENTRAL: Nakhon Nayok [Khao Yai National Park, 22 Nov. 2008, fruit, *Phonsena, Duyffjes & De Wilde 6343 (BKF, L)*]; SOUTH-EASTERN: Prachin Buri [from Dong Yang to Heo Narok, 14.18 N; 101.20 E, 17 Dec. 2009, fruit, *Phonsena, Duyffjes & De Wilde 6528 (BKF, L)*]; Chon Buri [Khao Khiao, 6 June 1976, male flower, *Maxwell 76-381 (L)*]; Chanthaburi [Khao Khitchakut National Park, 30 April 2003, male flower, *Phonsena 3762 (BKF, L)*].

Distribution.— China: Guangdong, 23 Sept. 1978. *K'tung 78 (L)*; *ibid.*, 9 Aug. 1933, *Tso 23625 (NY)*; 1904, *Levine & McClure 6965 (L)*; Hainan, 10 June 1928, *Tsang 623 (L)*; Laos: Khammouan, 6 Nov. 2005, *Newman et al. LAO 910 (E, L)*, *ibid.* 9 Oct. 2006, *Nanthavong et al. 705 (L)*; Vietnam: [Tonkin Dam Ha, May–July 1940, *Tsang 30131 (P)*; *Bon 1009 (P)*].

Ecology.— Forest edges in montane forest; at 400–1160 m altitude.

Notes.— 1. *Trichosanthes pedata* is a new record for Thailand. The description given is drawn from material from Thailand, Laos, and Vietnam.

2. At the time of publication of the Cucurbitaceae for the *Flora of Thailand* (De Wilde & Duyfjes, 2008) it was supposed that *T. wawrae* was the only foliolate-leaved *Trichosanthes* in Thailand, confined to the South-East and the Peninsula. Since then, some foliolate-leaved collections from areas more to the north have been made. These were found to be superficially very similar to *T. wawrae*, but differed in having significantly smaller but thicker (less compressed) seeds, and apparently belonged either to *T. pedata* (including var. *yunnanensis*) or to *T. quinquefolia* C.Y.Wu (Wu, 1980), both described from China. Because most of the literature on the latter two species is in Chinese, and critically determined Chinese specimens are scarce, we cannot fully appraise the characters for these species. Provisionally we prefer to name the material from Thailand (except that from the Peninsula), Laos and Vietnam as *T. pedata*. Only the material of Southern Peninsular Thailand (Satun, Pattani) is of *T. wawrae*. The seeds of *T. wawrae* measure 15–17 by 10–11 mm. Differentiating characters between *T. pedata* (including var. *yunnanensis*), and *T. quinquefolia*, as taken from Lu & Jeffrey (2011), are shown in Table 1.

3. In view of the great variation in seed-size, and also in the general morphology of the leaves, it is most likely that *T. pedata*, as understood for Indochina and described above, represents more than one taxon. However, if two species are distinguished in the future, based on more collections, it is clear that the second available name, viz. *T. quinquefolia*, as defined for China (Lu & Jeffrey, 2011), cannot be used in Thailand. This is because the collection *Phonsena, Duyfjes & De Wilde 6343* (Thailand), with 5-foliolate leaves, of which the central leaflet has entire margins, the petiolules 0.2–0.5 cm long, and seeds 11–12 mm long, or *Newman et al. LAO 910* (Laos), with 3-foliolate leaves, the margin rather dentate, the petiolules ca 5 mm long, and seeds ca 15 mm long, blurs the distinction between these species. A final solution can only be reached after more material is studied.

6. *Trichosanthes pilosa* Lour. var. *roseipulpa* W.J.de Wilde & Duyfjes, Reinwardia 12(4): 271.

2008.— Type: Thailand, Nan, *Phonsena, De Wilde & Duyfjes 4694* (holotype **BKF**; isotype **L**).

In the *Flora of Thailand* (De Wilde & Duyfjes, 2008), the photo of the fruit of this variety (pl. 40: 3) shows a green fruit with white streaks and with bright orange pulp. At that time this variety was only known from Nan. The variety has now also been collected with orange-red fruits (and orange-red pulp) on Doi Pha Hom Pok (Chiang Mai), from which it can be concluded that the fruit ultimately ripens red. It is possible that the fruit is often taken by birds before it fully ripens.

Thailand.— NORTHERN: Nan [Doi Phu Kha National Park, 18 Sept. 2003, fruit, *Phonsena, De Wilde & Duyfjes 3949* (**BKF, L**); *ibid.*, 25 Nov. 2005, fruit, *Phonsena, De Wilde & Duyfjes 4694* (**BKF, L**); *ibid.* 25 Nov. 2010, fruit, *Phonsena, De Wilde & Duyfjes 4701* (**BKF, L**)]; Chiang Mai [Doi Pha Hom Pok, 14 Dec. 2009, fruit, *Phonsena, Duyfjes & De Wilde 6526* (**BK, BKF, L, QBG**)]; Phitsanulok [Phu Hin Rong Kla National Park, 6 Dec. 2009, fruit, *Phonsena, Duyfjes & De Wilde 6481* (**BK, BKF, L**)].

7. *Trichosanthes tricuspidata* Lour. subsp. *rotundata* W.J.de Wilde & Duyfjes, Reinwardia 12: 413. 2009.— Type: Thailand, Sakon Nakhon, from Tao Ngoi to Mueang Sakon Nakhon, *Pooma et al. 2574* (holotype **BKF**; isotype **L**).—*Trichosanthes kirilowii* auct. non Maxim.: Keraudren in Aubrév. & J.-F. Leroy, Fl. Cambodge, Laos & Vietnam 15: 84. 1975. Fig. 6G.

Climber 5–8 m long, leafy stem 2–3 mm thick, with tuberous rootstock ca 30 by 3 cm; plant green-brown on drying, minutely hairy (hairs ca 0.1 mm long), glabrescent; cystoliths obvious. *Probract* elliptic or blunt-triangular, 2–3 mm long, glands not obvious. *Tendrils* (2- or 3-branched). *Leaves*: petiole 3–7.5 cm long; blade membranous, simple, shallowly or deeply 3- or 5- (or 7)-lobed nearly to the base, subcircular in outline, 8–20 cm diam., base cordate, lobes triangular or (narrowly) elliptic, the (middle) lobes entire or (deeply) 3(–5)-lobulate, apex acute(–acuminate), occasionally rounded; glands few, ca 0.5 mm diam., scattered. *Male raceme*: including peduncle (10–)15–30(–40) cm long, glabrescent; peduncle (6–)10–12 cm long, 2–3 mm thick; rachis (5–)10–20-flowered;

bracts membranous, whitish green with contrasting green glands, persistent or late-caducous, obovate-elliptic, (10–)15–25(–30) by 10–15 mm, margin deeply lacinate to ca 1/3 way, lobes many, 5–10 mm long, acute. *Male flowers* minutely hairy; pedicel absent or 1–2 mm long; receptacle-tube 30–35 mm long, much narrower in the lower (2/3–) half, at apex 5–7 mm wide; sepals with or without 1–3 conspicuous glands, narrowly long-triangular, ca 10 mm long, 3–4 mm wide at base, margin subentire or with few small or conspicuous narrow lobes; petals white, obovate or subtruncate, 10–15 mm long, threads 15–20 mm long; synandrium not investigated. *Female flowers* not seen. *Fruits* ripening evenly bright (orange-)red, ovoid-ellipsoid, 5–7(–8) by 3.5–5(–6) cm; exocarp leathery, smooth, coarsely wrinkled on drying; pulp green-black; fruiting pedicel (1–)1.5–2.5 cm long, 3–5 mm wide. *Seeds* thickish, 9–11 by 5–7 by 2.5–3 mm, base and apex rounded, smooth, not margined, edges rounded.

Thailand.—NORTHERN: Mae Hong Son [near Mae Sanam Arboretum, 27 Aug. 2000, fruit, *De Wilde & Duyfjes* 22167 (**L**)]; Chiang Mai [Doi Inthanon, 28 July 1988, fruit, *Takahashi* T-62576 (**BKF, L**); *ibid.*, 25 Aug. 2000, sterile, *De Wilde & Duyfjes* 22150 (**L**); *ibid.*, 22 Nov. 2004, fruit, *Phonsena, De Wilde & Duyfjes* 4459 (**BKF, L**); Doi Mueang On, 22 July 1998, male flower, *Palee* 385 (**CMU, L**); Doi Suthep, 21 Oct. 1987, fruit, *Maxwell* 87-1224 (**CMU, L**); Lampang [Chae Son National Park, 22 June 1996, male, *Maxwell* 96-854 (**CMU, L**); Phrae [Mae Yom National Park, 10 June 2006, *Maxwell* 6-375 (**L**); Tak [Taksin Maharat National Park, 20 Aug. 1995, fruit, *Parnell et al.* 95-270 (**AAU, BKF, K, L, TCD**); Phitsanulok [Phrom Phiram, 45 km from Phitsanulok to Uttaradit, 20 Sept. 2003, fruit, *Phonsena, De Wilde & Duyfjes* 3977 (**BKF, L**)].—NORTH-EASTERN: Sakon Nakhon [from Tao Ngoi to Mueang Sakon Nakhon, 17.08 N; 104.06 E, 24 Aug. 2001, fruit, *Pooma et al.* 2574 (**BKF, L**, type); *ibid.*, from Ta Rae to Si Song Khram, 17.7 N; 104.12 E, 25 Aug. 2001, fruit, *Pooma et al.* 2585 (**BKF, L**); Phu Phan National Park, 7 Aug. 2010, male flower, *Phonsena & Sutthisaksopon* 6538 (**BKF, KGU**)].—EASTERN: Chaiyaphum [29 Aug. 2001, fruit, *Pooma et al.* 2943 (**BKF, L**)].—CENTRAL: Lop Buri [Khao Samo Khon, 24 July

2007, male flower, *Phonsena & Patthum* 5502 (**BKF, L**); Saraburi [18 Sept. 2004, fruit, *Pooma et al.* 4800 (**BKF, L**)].

Distribution.—Laos: Champasak, Som Isl., 12 Sept. 1998 *Maxwell* 98-910 (**CMU, L**); Vietnam.

Notes.—*Trichosanthes tricuspidata* subsp. *rotundata* was described in order to accommodate specimens in general appearance strikingly similar to *T. tricuspidata* subsp. *tricuspidata* but differing in seeds with a rounded, not square, edge.

Additional material revealed that such specimens further differ in (1) the whitish male bracts with contrasting green glands, of which the margin is deeply and more finely dissected; (2) the often deeper and more lobed leaves ((3-) 5-lobed). This set of characters may warrant the status of species for *Trichosanthes tricuspidata* subsp. *rotundata*. In view of the wide distribution of this taxon in northern Thailand, Laos, and Vietnam, it is likely that it also occurs also in China, but the key to the species as presented by Lu & Jeffrey (2011) gives no clear clue to a species. One would suspect one of the following two names: *T. laceribractea* Hayata (1911) or *T. fissibracteata*, but the descriptions given in the flora of China do not agree with our description of *T. tricuspidata* subsp. *rotundata* as given above.

8. *Trichosanthes truncata* C.B. Clarke in Hook.f. Fl. Brit. India 2: 608. 1879; Duyfjes & Priesapan. Thai Forest Bull., Bot. 32: 99. 2004; L.Q. Huang & C. Jeffrey in A.M. Lu & C. Jeffrey, Fl. China: species no. 9. 2011.—Type: India, Khasia, *Hooker & Thomson* 1188 (lectotype **K**, designated by Duyfjes & Priesapan (2004)). Fig. 1B.

In the *Flora of Thailand* (De Wilde & Duyfjes, 2008), the fruit was not known from Thailand and the description was taken from Chinese material. In November 2008 this species, ca 10 m long liana, was found with ripe fruits along the forest edge in Loei, Phu Luang Wildlife Sanctuary (*Phonsena, Duyfjes & De Wilde* 6329). The description of the fruit is as follows:

Fruits ripening dark green, ellipsoid, ca 16 by 9 cm, glabrous; exocarp thin, leathery, and somewhat wrinkled on drying; pulp creamy, fibrous, sweet, not bitter; fruiting pedicel ca 2.5 cm long, 5 mm

wide. *Seeds* numerous, somewhat flattened, light brown, smooth, exceptionally large, 26–30 by 15–20 by 6–8 mm, base truncate, apex rounded, margin faint, edge sharp.

Notes.— In Lu & Jeffrey (2011) the seeds are variable and described as “10–23 × 5–20 mm”, and hence considerably smaller than those found in Thailand. The implications of this discrepancy have still to be determined.

(IX) A REMARKABLE STERILE GROWTH FORM OF *ZANONIA INDICA* L. SUBSP. *ORIENTALIS* W.J.DE WILDE & DUYFJES

A sterile unidentified collection of strange appearance, *Corner SF 29980A* (SING) from Johor, collected in 1935, puzzled the Singapore botanists Corner and Holttum. The latter (as written on the sheet) presumed that it represented a possible new *Alsomitra* and that it should be compared to the collection *Marcan 726* from Thailand. The present authors determined both *Marcan 726* (L) and *Corner SF 29980A* as *Zanonia indica*. The latter collection was obviously taken from a sterile long-running shoot over or near the forest floor. It differs from normal growing shoots of *Zanonia* in having relatively long-petioled hastate leaves and, in addition to the apically bi-furcate tendrils, in having some nodes with one extremely long thread-like unbranched outgrowth. These are of a strong consistency, ca 80 cm long and 0.5(–1) mm thick, not or not yet furcated at the apex and obviously homologous with tendrils. This strange phenomenon is pictured in Fig. 11.

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National Park. Jan van Os (Leiden) prepared the beautiful drawings, Ben Kieft (Leiden) scanned the drawings for publication, and Jan-Frits Veldkamp (Leiden) translated the diagnoses of the new taxa into Latin.

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Figure 11. *Zanonía indica* L. subsp. *orientalis* W.J.de Wilde & Duyfjes: Portion of sterile twig with 2 long thread-like outgrowths (*Corner 29980A* (SING)).

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