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Coeliccia sirindhornae sp. nov., A New Damselfly (Odonata: Platycnemididae) from Northwest Thailand

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ABSTRACT.– A new species of the genus *Coeliccia* Kirby, 1890, *C. sirindhornae* sp. nov., is described based on specimens of both sexes collected from Kanchanaburi Province, Thailand. This species can be differentiated from its congeners by its unique combination of morphological characters, including the shape of antehumeral stripe, the structure and pattern of prothorax, and the shape of anal appendages in both sexes, and the markings on the terminal abdominal segments in female.

KEYWORDS: damselfly, new species, Zygoptera, Kanchanaburi, *Coeliccia*

INTRODUCTION

The genus *Coeliccia* Kirby, 1890 comprises around 80 medium-sized damselfly species distributed across Asia, ranging from India to Japan and extending southward to Indonesia (Steinhoff & Uhl, 2015; Listed in Paulson et al., 2025). Thailand is currently home to eleven described species and one undescribed species, these are *C. albicauda* (Förster in Laidlaw, 1907), *C. chromothorax* (Selys, 1891), *C. didyma* (Selys, 1863), *C. doisuthepensis* Asahina, 1984, *C. erici* Laidlaw, 1917, *C. hoanglienensis* Do, 2007, *C. kazukoae* Asahina, 1984, *C. loogali* Fraser in Laidlaw, 1932, *C. nigrescens* Laidlaw, 1931, *C. poungyi* Fraser, 1924, and *C. yamasakii* Asahina, 1984 (Hämäläinen and Pinratana, 1999; Dow et al., 2018; Buppachat et al., 2020). The undescribed species was reported for the first time from Kanchanaburi Province by Donnelly and Michalsky (1993). Later, Hämäläinen and Pinratana (1999) extended its known distribution range southward to Krabi Province.

A recent examination of specimens of the previously undescribed species, collected from both provinces, revealed that it actually consists of a composite of two morphologically similar species. One of these species is described and illustrated in the present study.

MATERIALS AND METHODS

The specimens were collected using a sweep net and stored in envelopes for 1–2 days. Subsequently, they were immersed in acetone for 8–12 hours, air-dried for 3–4 hours, and then returned to envelopes for preservation. Measurements and photographs were taken using a ZEISS Stemi 508 stereomicroscope equipped with an OPTIKA C-P6 Digital Camera. Illustrations were created using the Procreate application on an iPad Pro 2020, based on representative digital photographs. Final plates were assembled using AFFINITY Photo. The holotype and one female paratype are deposited in the Thailand Natural History Museum (THN HM), Pathum Thani, Thailand. The remaining paratypes are preserved in the private collection of NM's collection (NMC), Nakhon Sawan, Thailand, and in the Zoological Collection of Duy Tan University (ZCDTU), Danang, Vietnam.

Some terminology for the female prothorax follows Dow (2010, 2016). The following abbreviations are used throughout the text below: m = meter, mm = millimeter, HW = hindwing, FW = forewing, Arc = arculus, Ax = antenodal crossvein, Px = postnodal crossveins, R1–4 = branch of radius 1 to 4, S1–10 = abdominal segments 1 to 10.

RESULTS

Taxonomy

Family Platycnemididae Jacobson & Bianchi, 1905

Genus *Coeliccia* Kirby, 1890

Coeliccia sirindhornae sp. nov.

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(Figs 1–7)

Type material.– Holotype: 1 male, Thailand, Kanchanaburi, Sangkhla Buri, Prangphle, 3–iv–2017, N. Mak-

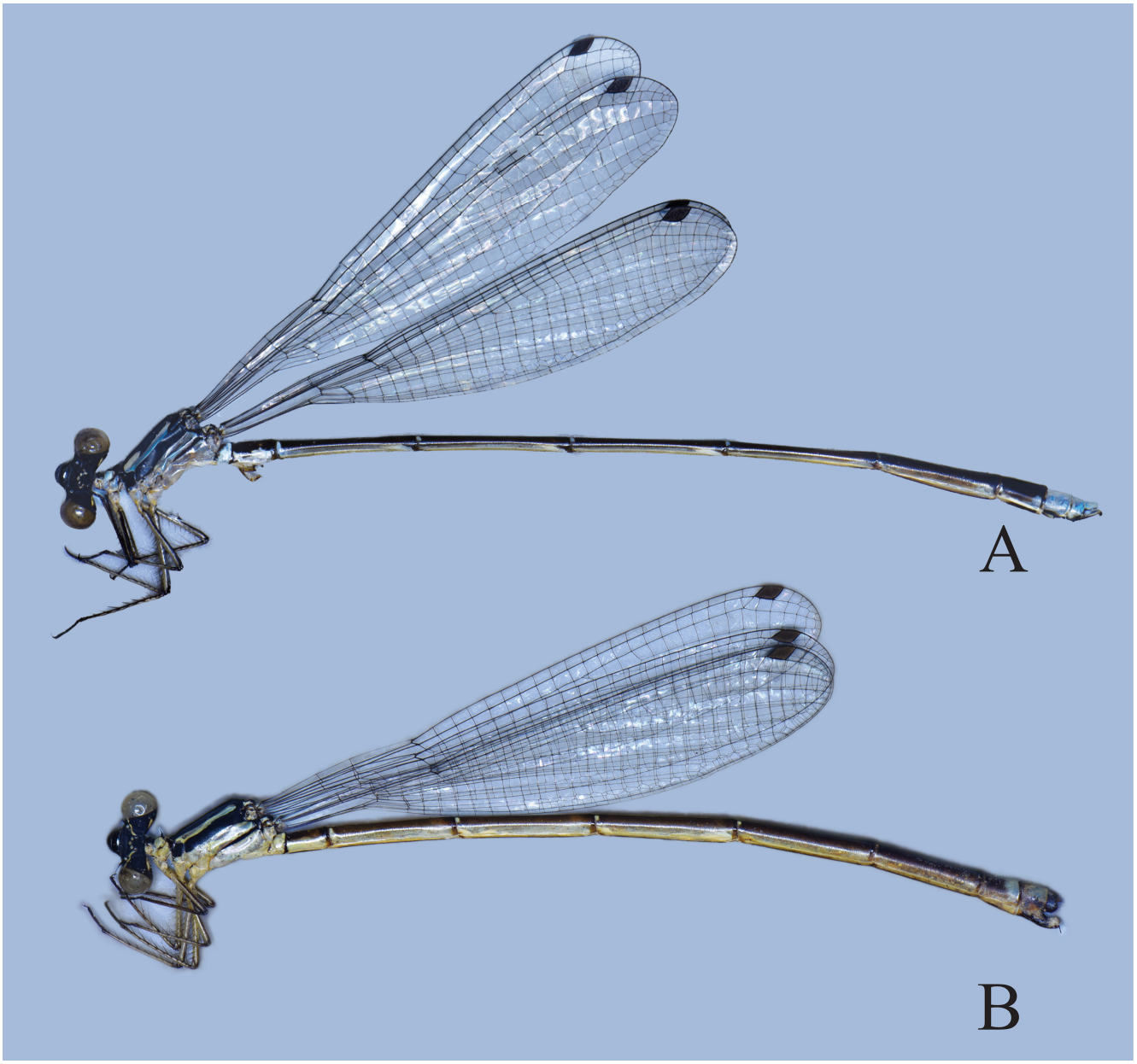

FIGURE 1. *Coeliccia sirindhornae* sp. nov. **A.** Holotype ♂. **B.** Paratype ♀.

bun leg. **Paratypes:** 1 female, same locality and collector as holotype, 4–iv–2017 (specimen for female description); 1 male, same location and collector as holotype, 4–v–2011; 1 male, same locality and collector as holotype, 3–iv–2017; 4 males, same locality and collector as holotype, 20–v–2011; 4 males, Thailand, Tak, Phop Phra, Chong Khaep, 1–vi–2011, N. Makbun leg.; 1 males, Thailand, Tak, Phop Phra, Chong Khaep, 6–v–2012, N. Makbun leg.; 1 male (immature), Thailand, Tak, Phop Phra, Chong Khaep, 28–iii–2013, N. Makbun leg.; 1 male (immature), Thailand, Tak, Phop Phra, Chong Khaep, 27–iii–2013, N. Makbun leg.; 1 male, Thailand, Kanchanaburi, Nang Kroan, 25–vi–2017, A. Pinratana leg; 1 male, Thailand, Kanchanaburi, Nang Kroan, 4–iv–2001, A. Pinratana leg.; 1 female, Thailand, Kanchanaburi, Nang Kroan, 22–v–2001, A. Pinratana leg.; 2 females, Thailand, Kanchanaburi, Nang Kroan, 25–vi–2000, A. Pinratana leg.

Photographic observations.– 1 male, Thailand, Tak, Mae Sot, Taksin Maharat National Park, 15–viii–2022, Andrew J. Pierce; 1 male, Thailand, Kamphaeng Phet, Khlong Nam Lai, Mae Wong National Park, Chong Yen, 17–ix–2022, Benjamyn Weil; 2 males, 1 female, same locality, 8–vi–2023, Tai Ping Ling; 1 male, same locality, 20–vi–2024, muangpaisuetrong (https://www.inaturalist.org/observations/225117477)

Etymology.– The specific epithet is dedicated to Her Royal Highness Princess Maha Chakri Sirindhorn in

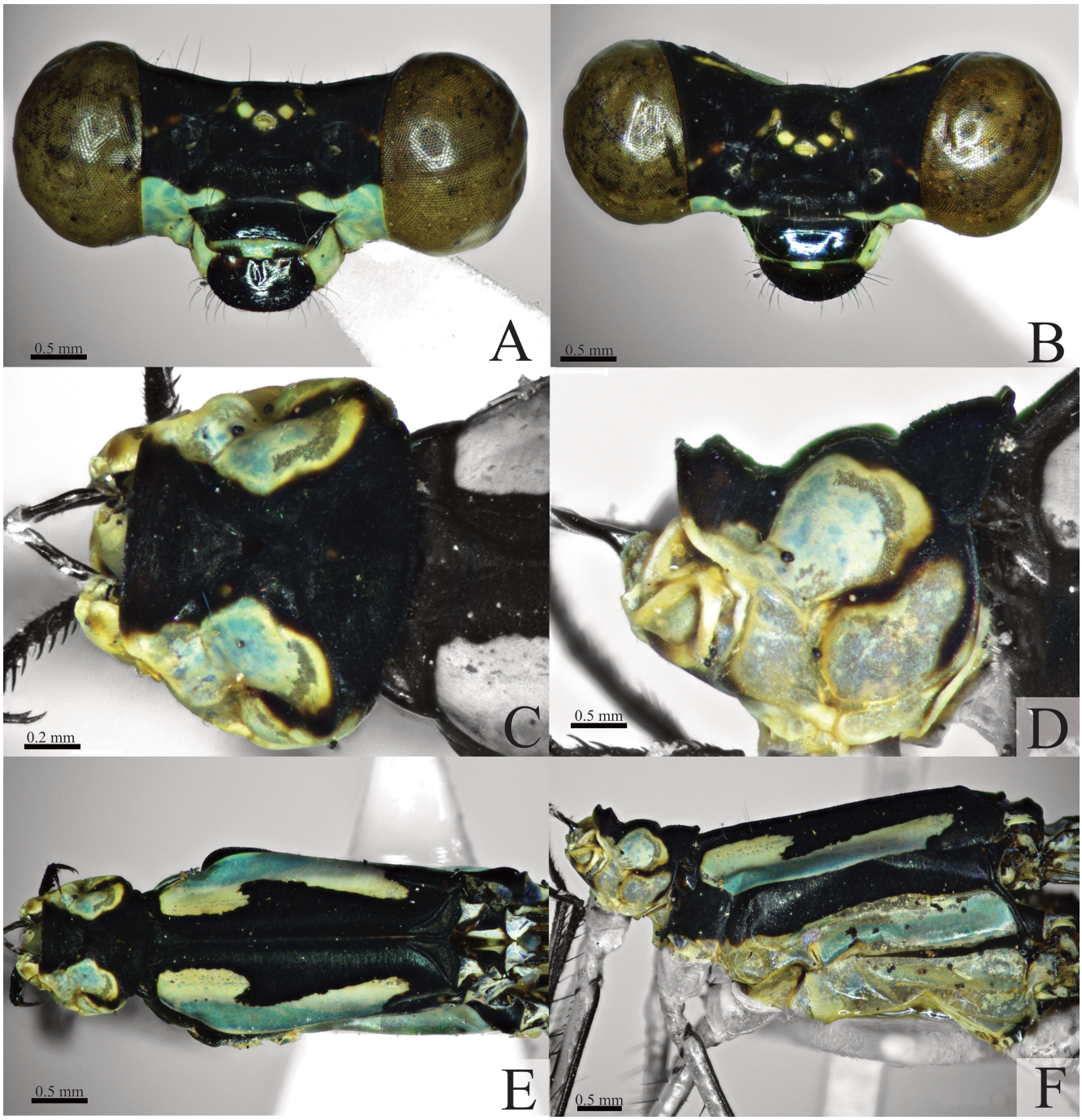

FIGURE 2. Structures of holotype ♂ of *Coeliccia sirindhornae* sp. nov. **A.** Head in frontal view. **B.** Head in top view. **C.** Prothorax in dorsal view. **D**. Prothorax in lateral view. **E**. Synthorax in dorsal view; **F.** synthorax in lateral view.

commemoration of her 70th birthday anniversary and in recognition of her enduring contributions to the promotion and support for initiatives with profound significance for biodiversity research and conservation efforts in Thailand. It is a noun in the genitive case.

Description of holotype.–

Head (Figs 1A, 2A, B): Labium yellowish white except labial palps, which are black. Labrum, postclypeus and postfrons shining black. Anteclypeus shining black with blue T-mark. Mandible and genae entirely blue. A blue band with a bisinuate upper margin extends from the eye margin to a short distance along the antefrons, terminating in a triangular tip. Antennal scape black with whitish apically, pedicel black except its base whitish, and flagella black. The median ocellus and lateral ocelli yellowish. A yellow, square-shaped spot located between the median ocellus and the lateral ocelli. Dull yellow spots arranged in a slanting line extending from the outer side of the lateral ocelli to the

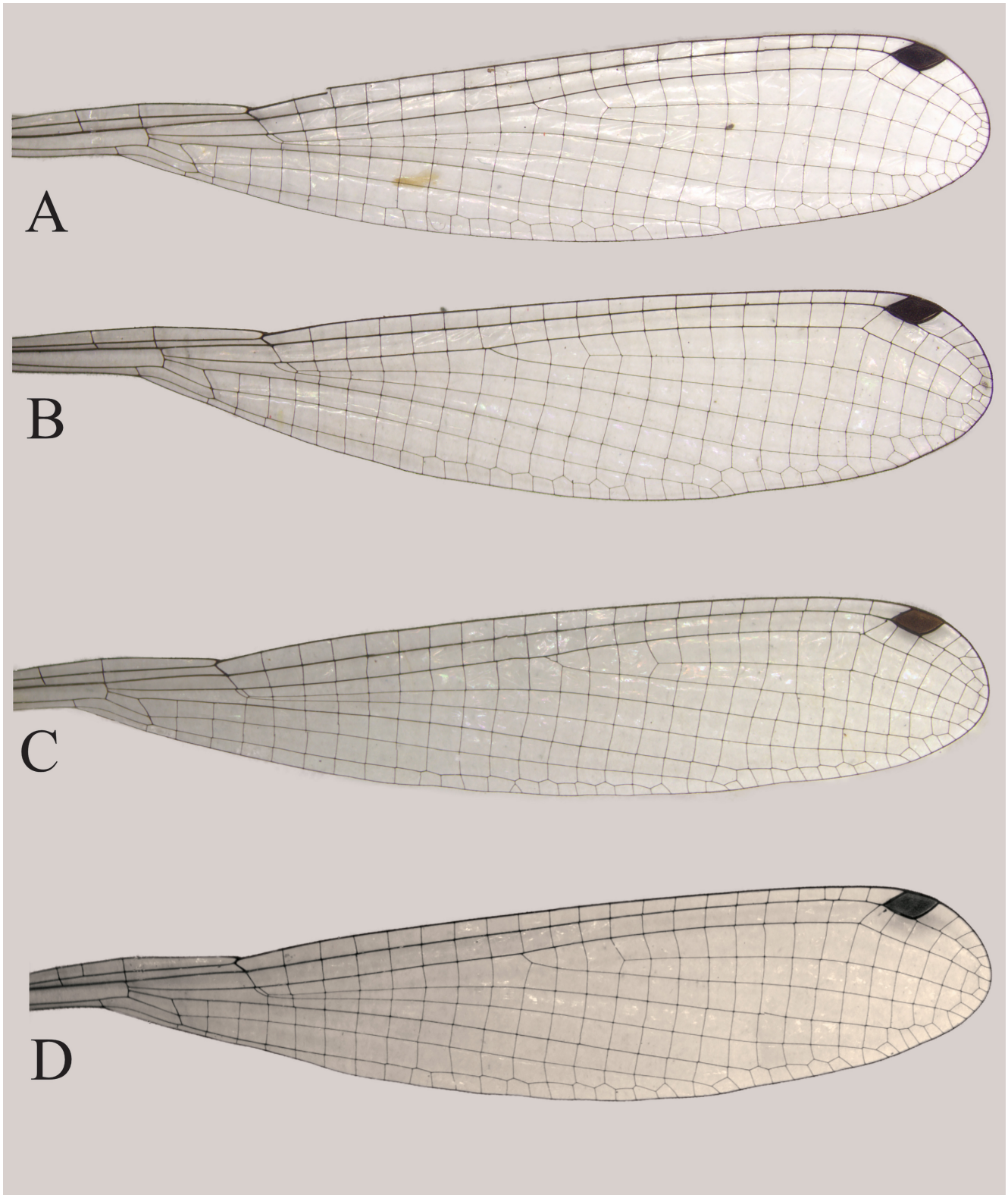

FIGURE 3. Wings of *of Coeliccia sirindhornae* sp. nov. **A, B.** Holotype ♂ and **C, D.** Paratype ♀.

eye margin. Occiput shining black with black setae. Postocular lobe with a yellowish, elongate oval, transverse postocular spot.

***Thorax*:** Prothorax (Fig. 2C, D) bluish with black markings. Anterior lobe dorsally black, this extending laterally except along the lower margin. Middle lobe black dorsally, this colour narrowest at the middle and gradually widening both anteriorly and posteriorly. Posterior lobe extends to partially cover the mesostigmal region of the synthorax, with its posterior margin

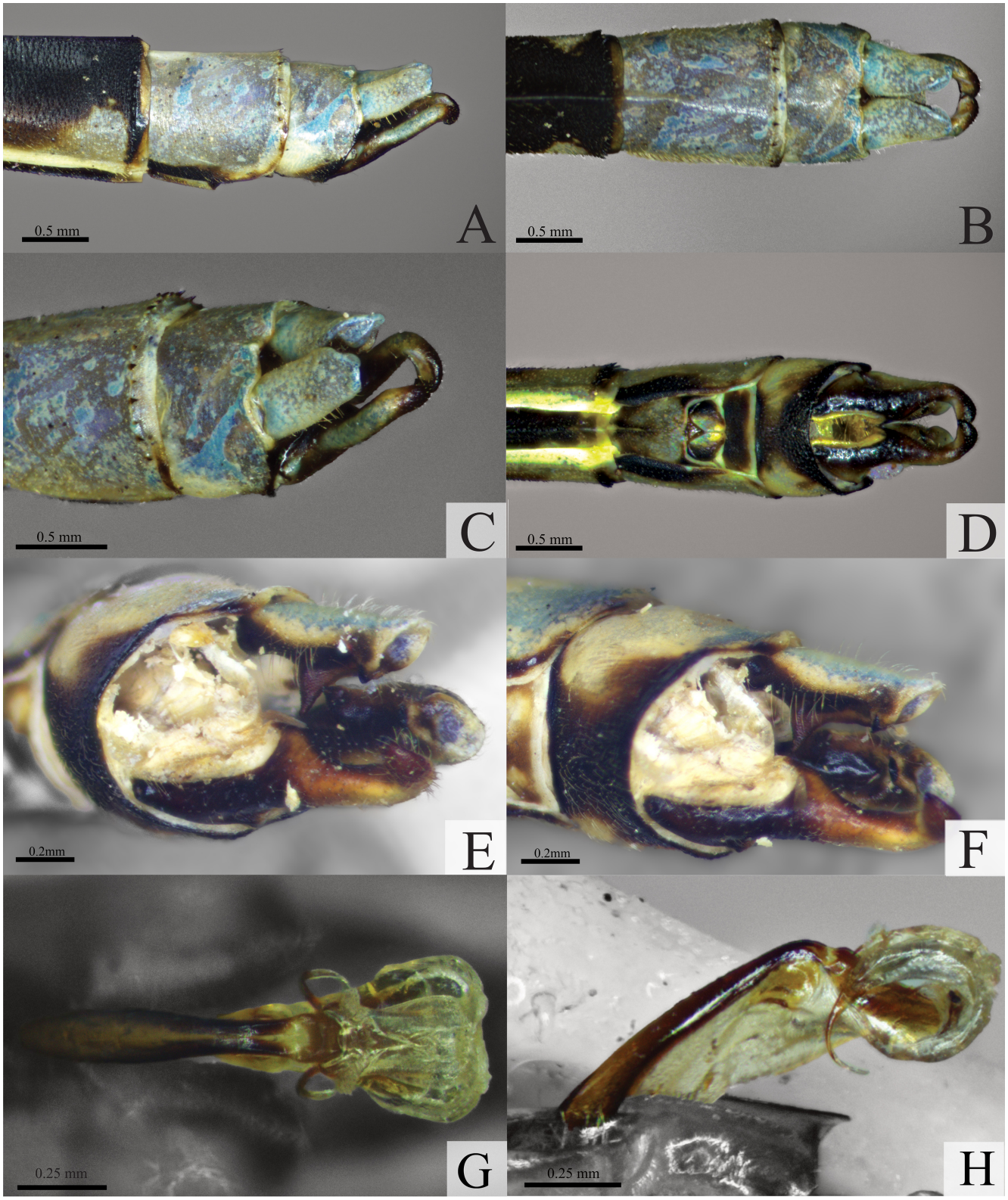

FIGURE 4. Abdominal tip including appendages **A–F.** and genital ligula **G, H.** of *Coeliccia sirindhornae* sp. nov., holotype ♂. **A.** Lateral view. **B.** Dorsal view. **C.** Oblique-dorsal view. **D.** Ventral view. **E**. oblique-dorsal view, with the right paraproct removed to allow ventral view of the right cercus (paratype from the location same holotype). **F.** oblique-dorsal view, with the right paraproct removed to allow ventral view of the right cercus (paratype from Kanchanaburi, Nang Kroan, 4–iv–2001). **G.** Ventral view. **H.** Lateral view.

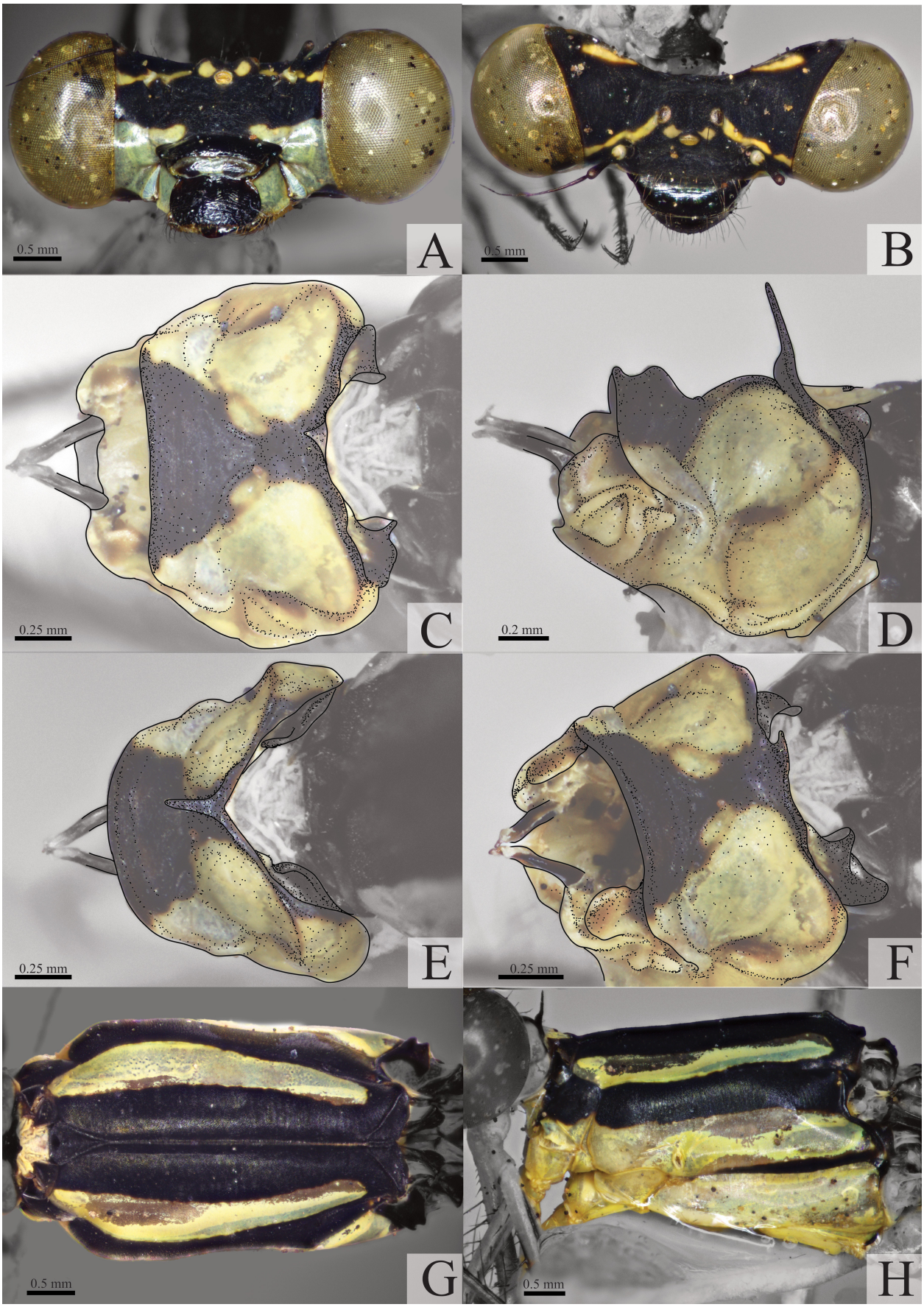

FIGURE 5. Structures of *Coeliccia sirindhornae* sp. nov., paratype ♀ (Kanchanaburi, Sangkhla Buri, Prangphle, 2–iv–2017). **A.** Head in frontal view. **B.** Head in top view. **C.** Prothorax in dorsal view. **D.** Prothorax in lateral view. **E.** Prothorax in postero-dorsal view. **F.** Prothorax in oblique-dorsal view. **G.** Synthorax in dorsal view **H.** Synthorax in lateral view.

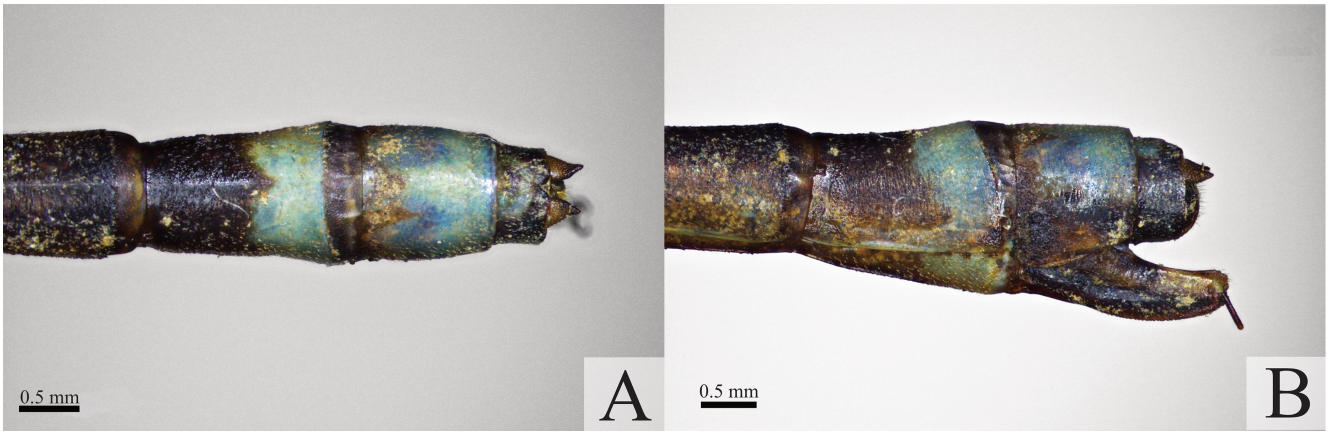

FIGURE 6. Abdominal tip including appendages of *Coeliccia sirindhornae* sp. nov., paratype ♀. **A.** Dorsal view. **B.** Ventral view.

narrowly and slightly raised upward. From the lower margin of the posterior lobe, two narrow black stripes emerge: the first stripe follows the notopleural suture and terminates near the narrowest point of the middle lobe, while the second stripe traces the posterior margin of the propleuron, reaching nearly to the lower margin. Propleuron predominantly bluish, except for the rear part of the upper margin and the posterior margin, which are narrowly black. Synhorax (Fig. 2E, F) predominantly black with blue markings. Mesepisternum black with large comma-shaped blue antehumeral stripes, extending from mesostigmal plate to the apex of antealar triangle. Mesepimeron black, except for a narrowly blue region above the interpleural suture for some distance. Mesinfaepisternum largely black with a pale lower margin. Metepisternum entirely blue. Metepimeron largely blue with a narrow black stripe extending from the posterior margin, terminates before the metathoracic spiracle. Venter of metathorax completely blue. Legs with coxae and trochanters entirely pale, femora mostly pale with a black stripe along the extensor surface, tibiae mostly pale but dark along flexor surface, tarsi dark, claws dark brown.

Wings (Fig. 3A, B) hyaline with black veins. Arc situated slightly distal to Ax2. Two Ax in all wings. FW with 20 Px, HW with 18 (right) – 19 (left) Px. Three post quadrilateral cells in all wings. R4 slightly distal to (FW) or at (HW) subnodus. Pterostigma dark brown, rhomboid, with two underlying cells.

Abdomen (Fig. 1A) elongated and slender, with a progressive widening in S7–10. S1 blue with black dorsal triangular marking, S2 predominantly black, featuring a pale band along its lateroventral region, S3–6 black with a narrow pale basal ring and subapical lateroventral spot, S7–8 black with an apical lateroventral spot, S9 entirely blue, except for the basal half of the ventral region, which is black, S10 wholly blue, bearing a black spot at the apicoventral corner.

Genital ligula (Fig. 4G, H) the apical segment bears lateral subapical rectangle-shaped protuberances and two flagella, with a hood-like structure.

Caudal appendages (Fig. 4A–F) covered with golden setae. In lateral view, cerci rectangular shape, paralleled sided, slightly raised upward, with rounded apex. The ventral surface black, bearing a large dark basal spine along with a smaller subapical spine on each cercus. Cerci entirely blue, subtriangular with apex rounded, its length slightly longer than S10 in dorsal view. In ventral view, cerci ventrally bear a subapical spine on each cercus, its black tip directed inward. The large basal spine, entirely concealed by the paraproct, with its darkened apex slightly bent inward. Paraprocts, as seen in lateral view, largely dark, directed upward, parallel to the cerci, blue on the dorsum and with a pale hue on the inner surface. Paraprocts longer than the cerci, broad at the base, and become distinctly narrow, maintaining parallel sides for a short distance beyond the cerci before curving obliquely downward and inward, with their tips overlapping. In dorsal view, the basal two-thirds of the paraprocts concealed beneath the cerci, while the apical one-third extends beyond the cerci, curving obliquely downward and inward. In ventral view, paraprocts largely dark, broad both at the base and at the middle, the inner surface of the basal half yellow.

Measurements (in mm).– Total length 53.22, HW 28.22, abdomen (including caudal appendages) 45.32.

Variations in paratype males.– The general appearance and markings of paratype males closely resemble those of the holotype, with the exception of variations in measurements. The total length, length of HW, and length of the abdomen (including caudal appendages) vary greatly, measuring 45.33–54.20 mm, 24.42–30.27 mm, and 38.29–46.28 mm, respectively. One wing of a specimen exhibits 3 Ax. The number of Px also varies greatly, with 17–23 in FW and 16–22 in HW. Addition-

FIGURE 7. *Coeliccia sirindhornae* sp. nov., in typical location. **A.** Male. **B.** Female. (Kanchanaburi, Sangkhla Buri, Prangphle, 2–iv–2017, photographed by NM).

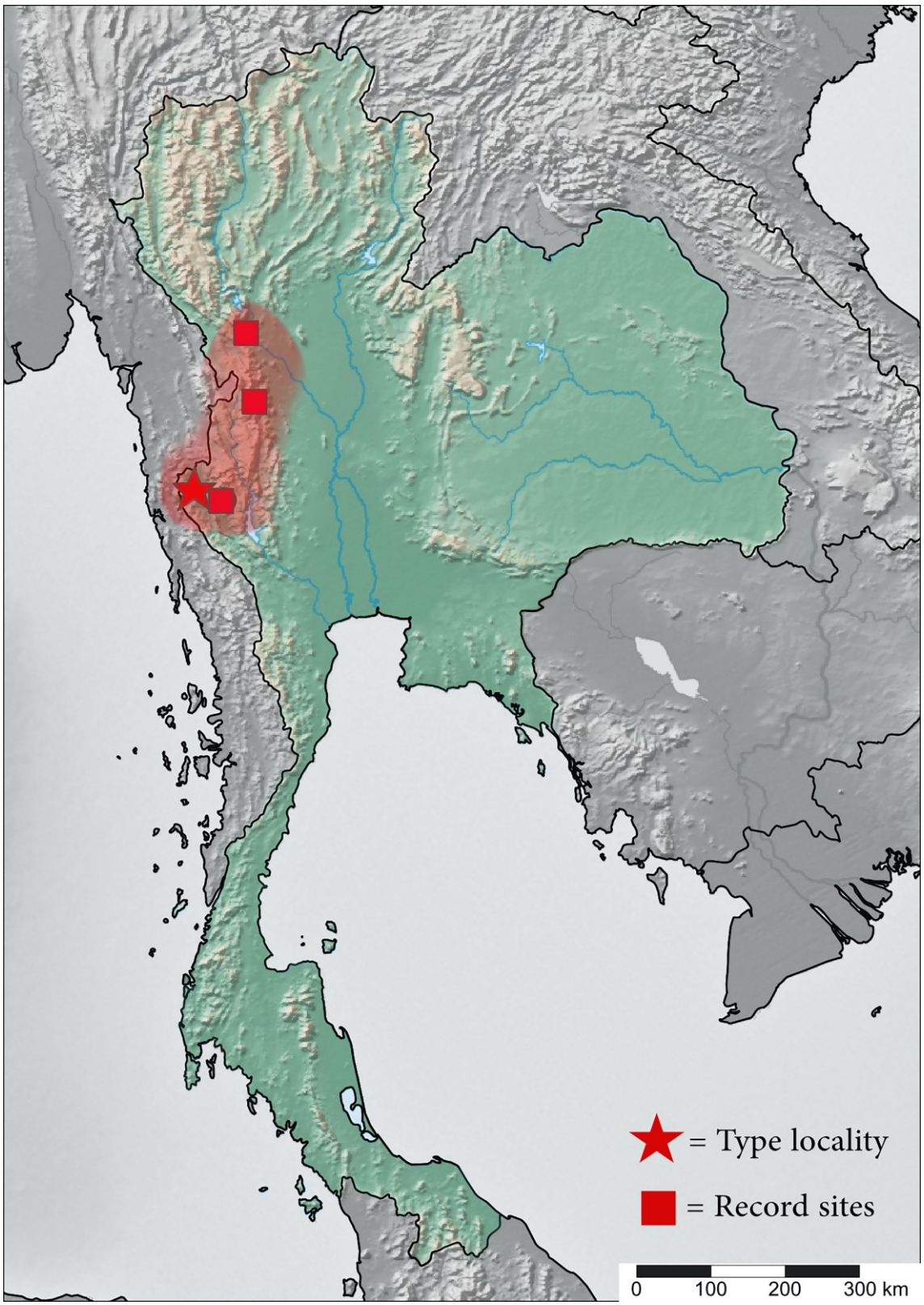

FIGURE 8. Distribution map of *Coeliccia sirindhornae* sp. nov.

ally, two immature male specimens differ in colouration, appearing yellow instead of blue. The markings on S9–10 are pale yellow.

Description of paratype female (Thailand, Kanchanaburi, Sangkhla Buri, Prangphle, 3–iv–2017, N. Makbun leg.) (Fig. 1B).– As male except as noted. *Head* (Figs 1B, 5A, B): well-defined, narrow yellow zigzag

stripes, marked by a few incisions, extends from the outer side of the lateral ocelli down to the eye margin. *Thorax* (Fig. 5C–H): prothoracic cervical spurs are entirely yellow, with the upper spur being small and partly concealed beneath the larger lower one, which is triangular in shape. The middle lobe is yellow, featuring a narrow middorsal band that is broadest at both ends and tapers gradually toward the center. Simple, rounded notopleural projections present, yellow. Posterior lobe predominantly black, with subtle yellowish spots situated between the prothoracic lapels and the prothoracic horn. It is basally wide and raised upward for a short distance. The prothoracic lapels rectangular in shape, curving backward to partially cover the mesostigmal plate in lateral view. The prothoracic horn broad at its base and abruptly narrows toward the tip in dorsal view. In lateral view the lower ca. one-third of the prothoracic horn is bulged to the front before contracting, the horn as a whole slanted slightly forward, as long as the middle prothoracic lobe measured centrally. A narrow brownish stripe runs along the notopleural suture, ending just before the notopleural projection. The synthoracic antehumeral yellow stripes are prominent and large. They gradually attenuate posteriorly, ending in a blunt tip. These stripes extend from the mesostigmal area to the level of the antealar triangle.

Wing (Fig. 3C, D): Arc situated distal to (FW) or at (HW) Ax2. R4 located slightly distal to subnodus in both wings. FW with 2 Ax and 20 Px, HW with 2 (left) – 3 (right) Ax and 19 (left) – 20 (right) Px.

Abdomen (Figs 1B, 6): more robust compared to that of the males. S8 with a blue subapical ring with a medial incision, covering approximately half of its length. S9 dorsally blue. S10 with a blue basomedial spot, occupying roughly two-third of its length. Cerci (Fig. 6), shorter than S10, dark brown in color, gradually transitioning to black toward the apex. They are broad at the base, tapering to a pointed tip, with the apical half curving outward. Ovipositor (Fig. 6B) extends beyond the cerci and predominantly dark, with the upper section of its apical half displaying a pale hue. Style dark brown, rod-shaped, and curves obliquely downward.

Measurements (in mm).– Total length 48.22, HW 29.08, abdomen (including caudal appendages) 40.89.

Variations in paratype females.– Although the markings and colouration remain similar, another paratype female exhibits a longer total length and length of HW, measuring 49.07 mm and 29.12 mm, respectively. However, the length of the abdomen (including caudal appendages) is comparatively shorter, at 40.62 mm.

Differential diagnosis.– Based on the terminal segment of the genital ligula furnished apically with two flagella and a hood-like structure (Fig. 4G, H), *Coeliccia sirindhornae* sp. nov. belongs to the *membranipes*–group as defined by Laidlaw (1932) and redefined by Dow (2016, 2020). Within this group, the males of the new species can be readily distinguished from other species through the following combination of morphological characters: (1) Prominent comma-shaped antehumeral stripes (Fig. 2E, F); (2) narrow black stripes running along almost the notopleural suture (Fig. 2F); and (3) paraprocts longer than the cerci in length, with their tips curving obliquely inwards (Fig. 4A).

The females of *C. sirindhornae* sp. nov. can be differentiated from congeners (with the exception of *C. junis* Dow, 2020, for which females are currently unknown (Dow 2020)) through the following combination of features: (1) The prominent basal bulge at the front of the prothoracic horn in lateral view (not known in any other named species from the *C. membranipes*-group) (Fig. 5D); (2) the dark stripe on the notopleural suture extending almost to the notopleural projection (Fig. 5D); (3) antehumeral stripes not broken into two parts and tapering toward wing bases (Fig. 5G, H); and (4) abdominal S8 only pale in apical half with S9 entirely blue dorsally (Fig. 6A, B).

Habitat and Ecology.– The new species typically perches on leaves within vegetation along partially shaded, shallow streams at altitudes ranging from 185 to 1,350 m (Fig. 7). It usually perches below waist level, but if disturbed, it may perch higher. Its flight season spans from March to September. Considering that the immature specimens were collected in late March, it is reasonable to expect that the emergence likely occurred in early to mid-March. The known distribution of this species is currently confined to the northwestern region of Thailand (Fig. 8). Given the proximity of the known distribution range of the new species to the Myanmar border, it is likely that the species also occurs in adjacent regions within Myanmar.

DISCUSSION

Coeliccia sirindhornae sp. nov. was previously referred to as an undescribed *Coeliccia* species in the works of Donnelly and Michalsky (1993) and Hämäläinen and Pinratana (1999). Following a thorough review of available records, particularly photographic evidence, as well as an examination of voucher specimens, it has been determined that this previously undescribed species, reported by Hämäläinen and Pinratana (1999) as being distributed from the northwestern to the southern regions, actually represents two

morphologically similar species new to science. Amongst these, one is described in this present study as *C. sirindhornae* sp. nov. which is confined to the north-western region (Fig. 8).

Coeliccia sirindhornae sp. nov. shares the distinctive hood-like structure and two flagella on the terminal segment of the genital ligula with members of the *C. membranipes*-group. This group is primarily known from Borneo, Sumatra, Singapore, and Peninsular Malaysia (Dow, 2016). The new species differs from the other members of the *C. membranipes*-group in a combination of characters; this is particularly true in the female where the basal bulge at the front of the long prothoracic horn and the colouration of the terminal abdominal segments are unique in the group. *Coeliccia sirindhornae* sp. nov. extends the distribution of the *C. membranipes*-group to north-western Thailand.

While most documented occurrences of *Coeliccia sirindhornae* sp. nov. are within protected areas, several habitats face significant challenges. In certain known locations, the species' habitat is gradually being degraded or lost due to anthropogenic disturbances. Therefore, an urgent conservation plan is essential to preserve the suitable habitats required for the survival of this remarkable species.

ACKNOWLEDGEMENTS

This work is dedicated to the memory of Brother Amnuay Pinratana, a pioneering Thai odonatologist and former headmaster of St. Gabriel's College, Bangkok. As one of the earliest researchers of dragonflies in Thailand, he played a crucial role in laying the foundation for odonatological studies in Thailand. We would like to sincerely thank Master Premsak Ratiwiriyapong, Dr. Suksawat Ponpinij, and Saint Gabriel's College, Bangkok, Thailand, for permission to examine the odonate specimens in Brother Amnuay Pinratana's insect collection. We express their heartfelt gratitude to Andrew J. Pierce, Benjamyn Weil, Tai Ping Ling, Muangpai Suetrong, and the members of the Facebook group "Dragonflies of Thailand" for their invaluable contributions in providing photographic records. QTP and TSK thank the International Dragonfly Fund for funding their conducted field surveys in Thailand. Last but not least, we extend their sincere thank to the editor and reviewers for their insightful suggestions and constructive comments.

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