

First record of the tribe Termatophylini (Hemiptera: Heteroptera: Miridae) from Vietnam, with descriptions of two new species

Junggong Kim¹ & Sunghoon Jung^{2, 3*}

Abstract. The plant bug tribe Termatophylini is recorded from Vietnam for the first time. It is represented by three species, *Kundakimuka cassis*, new species, *Termatophylum parvulum*, new species, and *T. orientale* Poppius, 1915. Detailed descriptions, including illustrations and photographs, and diagnoses of these species are provided, along with a key to the Vietnamese termatophylinae species. Brief observations on the biology of *Termatophylum parvulum*, new species are also presented.

Key words. description, *Kundakimuka*, Oriental Region, plant bug, predator, *Termatophylum*

INTRODUCTION

The tribe Termatophylini (Hemiptera: Heteroptera: Miridae) is currently recognised as a small group within the subfamily Deraeocorinae, comprising ten described genera (Schuh, 2002–2013; Schuh & Weirauch, 2020). Superficially, its members resemble those of the family Anthocoridae. Previously, this tribe was at times placed within Anthocoridae or even treated as belonging to an entirely different family. A detailed historical review of its classification was provided by Cassis (1995). However, recent phylogenetic analyses of Deraeocorinae have suggested that the tribe does not nest within this subfamily but rather occupies a position equivalent in rank to other subfamilies of Miridae (Kim et al., 2023). Consequently, a re-evaluation of the phylogenetic position and taxonomic status of this tribe is currently needed.

Although this tribe represents a small group, the members are widely distributed across tropical and subtropical regions of the world, including the Afrotropical, Australasian, Neotropical, Oriental, and Palearctic regions. This indicates a broad ecological and biogeographical range (Cassis, 1995; Schuh, 2002–2013). Prior to this study, no termatophylinae taxon had previously been recorded from the Southeast Asian

mainland, leaving a regional distributional gap between the Indian subcontinent and East Asia. The discoveries of the species from Vietnam, presented herein, therefore provide the first confirmed records of Termatophylini in this area, thereby extending the documented distribution of the tribe and contributing new data to our understanding of its distribution and diversity within the Oriental fauna.

The biology of this group remains poorly understood, but its members are generally considered predatory. Some species have been reported as predators of thrips or moth larvae (e.g., Myers, 1935; Callan, 1943; Cassis, 1995). Based on label data from examined specimens, Cassis (1995) summarised information on the habitat, feeding habits, and plant associations of several species. More recently, Varshney & Yeshwanth (2018) reported *Termatophylum orientale* Poppius, 1915 from India for the first time, providing detailed observations on its biology through rearing experiments, along with records of the plant species on which it was collected.

In the present study, three species have been recognised, including *Kundakimuka cassis*, new species and *Termatophylum parvulum*, new species. Descriptions, diagnoses of all three species, and a key to the termatophylinae species in Vietnam are provided.

Accepted by: Tran Anh Duc

¹The Center for Entomology & Parasitology Research, College of Medicine and Pharmacy, Duy Tan University, Da Nang 550000, Vietnam; E-mail: thesv12@gmail.com

²Laboratory of Systematic Entomology, Department of Applied Biology, College of Agriculture and Life Sciences, Chungnam National University, Daejeon, Korea; E-mail: jung@cnu.ac.kr (*corresponding author)

³Department of Smart Agriculture Systems, College of Agriculture and Life Sciences, Chungnam National University, Daejeon, Korea

MATERIAL AND METHODS

Photographs of the examined specimens were captured using an Optinity digital camera (KCS3-83SF2) mounted on a Zeiss Stemi 508 microscope, and image stacks were processed with Helicon Focus 8 software. Images of slide-mounted specimens were taken with a BKONV300 camera attached to a Kruss slide microscope. Final figures were compiled and edited in Adobe Photoshop 2020. All measurements, expressed in millimetres (mm), were obtained using OptiView

software installed on the Optinity digital camera system. Male genitalia were examined after the abdomen had been detached and macerated in a 10% KOH solution at 70°C for five minutes until internal structures became visible. Type specimens are deposited in the Zoological Collection of Duy Tan University (ZCDTU), Da Nang, Vietnam, and in the Insect Collections in the Laboratory of Systematic Entomology, Department of Applied Biology, College of Agriculture and Life Sciences, Chungnam National University (CNU), Korea. Terminology for external and genital morphology follows Cassis (1995) and Cassis & Eyles (2006).

TAXONOMY

Tribe Termatophylini Carvalho, 1957

Termatophylina Reuter, 1884: 218 (subfamily of Anthocoridae).
Ternatophylidae Reuter, 1910: 70; Reuter & Poppius, 1912: 2.
Ternatophylini Carvalho, 1957: 34; Schuh, 1975: 11; Cassis, 1995: 258.

Note. This tribe has been regarded by different authors as being either a subfamily of Anthocoridae, or a subfamily of Miridae, or even as an independent family-level group until it was formally recognised as a tribe of the subfamily Deraeocorinae, Miridae. A detailed historical review was provided by Cassis (1995). Although Cassis (1995) also concluded that the tribe belongs to Deraeocorinae, he noted its morphological affinities with another subfamily and tribe (Bryocorinae: Dicyphini). Subsequently, Kim et al. (2023) recovered this tribe as not being nested within other deraeocorine groups but instead placed it at a comparable hierarchical level to other subfamilies, suggesting that it represents an independent lineage. In light of this result, although the tribe is currently classified within Deraeocorinae, it is likely to be revised in the future, and the present study refrains from assigning it to a particular subfamily.

Genus *Kundakimuka* Cassis, 1995

Kundakimuka Cassis, 1995: 301; Cassis et al., 2011: 216; Yasunaga & Ito, 2024: 1.

Type species: *Kundakimuka carvalhoi* Cassis, 1995.

Kundakimuka cassisii, new species

(Fig. 1)

Type material. Holotype: female, VIETNAM: Ninh Binh Province, Cuc Phuong National Park, 20.3186°N, 105.6050°E, coll. J. Kim, 10 May 2017 (CNU).

Diagnosis. Recognised by the following combination of characters: large body, with length about 3.5 mm; dorsum mostly fuscous, with brownish parts on pronotum, scutellum and hemelytra; head entirely dark brown; first antennal segment entirely dark brown; scutellum with distinct medial heart-shaped reddish brown marking, outer margin dark brown; corium generally fuscous, with anterior and

posteromedial parts brown; cuneus mostly dark brown with anterior margin brown; fore and mid femora dark brown on basal half; hind femur dark brown except for apical part.

Description. FEMALE: Colouration: **Head:** mostly dark brown; vertex, frons and clypeus entirely fuscous; maxillary plate relatively paler, antennae mostly dark brown; first segment entirely dark brown; second segment brown with dark base; third and fourth segment entirely dark brown; labium brown, fourth segment entirely dark brown. **Thorax:** pronotum mostly fuscous, posterior margin brown; pronotal collar entirely fuscous; scutellum partly brown and dark brown, with distinct heart-shaped reddish brown marking medially, outer margin entirely fuscous; evaporatory area entirely fuscous; hemelytra mostly fuscous with brownish markings; corium mostly fuscous, anterior and posteromedial parts near cuneal fracture brown; clavus mostly fuscous except for pale anterior part and apex; anterior half of embolium brown, posterior half fuscous; cuneus mostly fuscous, anterior margin along cuneal fracture brown; membrane mostly greyish, lateral part near cuneal apex subhyaline; vein greyish; legs generally brown with dark part, partly tinged with red; coxa mostly dark brown, apically tinged with red; basal half of fore and mid femora dark brown, posterior half brown, apically tinged with red; hind femur mostly dark brown, apical part brown tinged with red; tibia and tarsus entirely brown, except for claw tinged with red. **Abdomen:** entirely fuscous except for ovipositor tinged with red. Surface and vestiture: body weakly shiny, densely covered with golden and long setae; head relatively dull; vertex, frons and clypeus covered with relatively short setae; antennae covered with short erected setae.

Structure: Body elongated-oval, length 3.51. **Head:** prognathous, length about twice as wide as long; vertex about 1.5 times as wide as single compound eye width; compound eye contiguous with pronotal collar; antennae partly swollen and linear; first segment thickest and shortest; second segment longest, subequal to 4x first segment length, shorter than combination of third and fourth segments; third segment longer than fourth segment; labium short, slightly surpassing fore coxae. **Thorax:** pronotum trapezoid, robust, approximately twice as wide at base as long, lateral margin slightly rounded, posterior margin sinuate; calli weakly swollen; pronotal collar about twice as thick as second antennal segment; posterior margin concave and straight in middle; calli somewhat swollen; scutellum somewhat large, about 1.6 times as wide as long, subequal to commissure length; exposed part of mesoscutum narrow; lateral margin of hemelytra nearly straight, slightly rounded apically; R+M vein longer than median flexion line; cuneus somewhat large, broad, about 0.32 times as long as corium; legs generally short; femur thick, hind femur thickest, about 1.7 times as thick as mid femur. **Abdomen:** abdominal apex reaching approximately level of apex of cuneus; ovipositor reaching abdominal apex. **Genitalia:** not examined.

Measurements (in mm). Female (n=1) Body length, clypeus–apex of membrane: 3.51; head length, excluding collar: 0.33; head width, including compound eyes: 0.64;

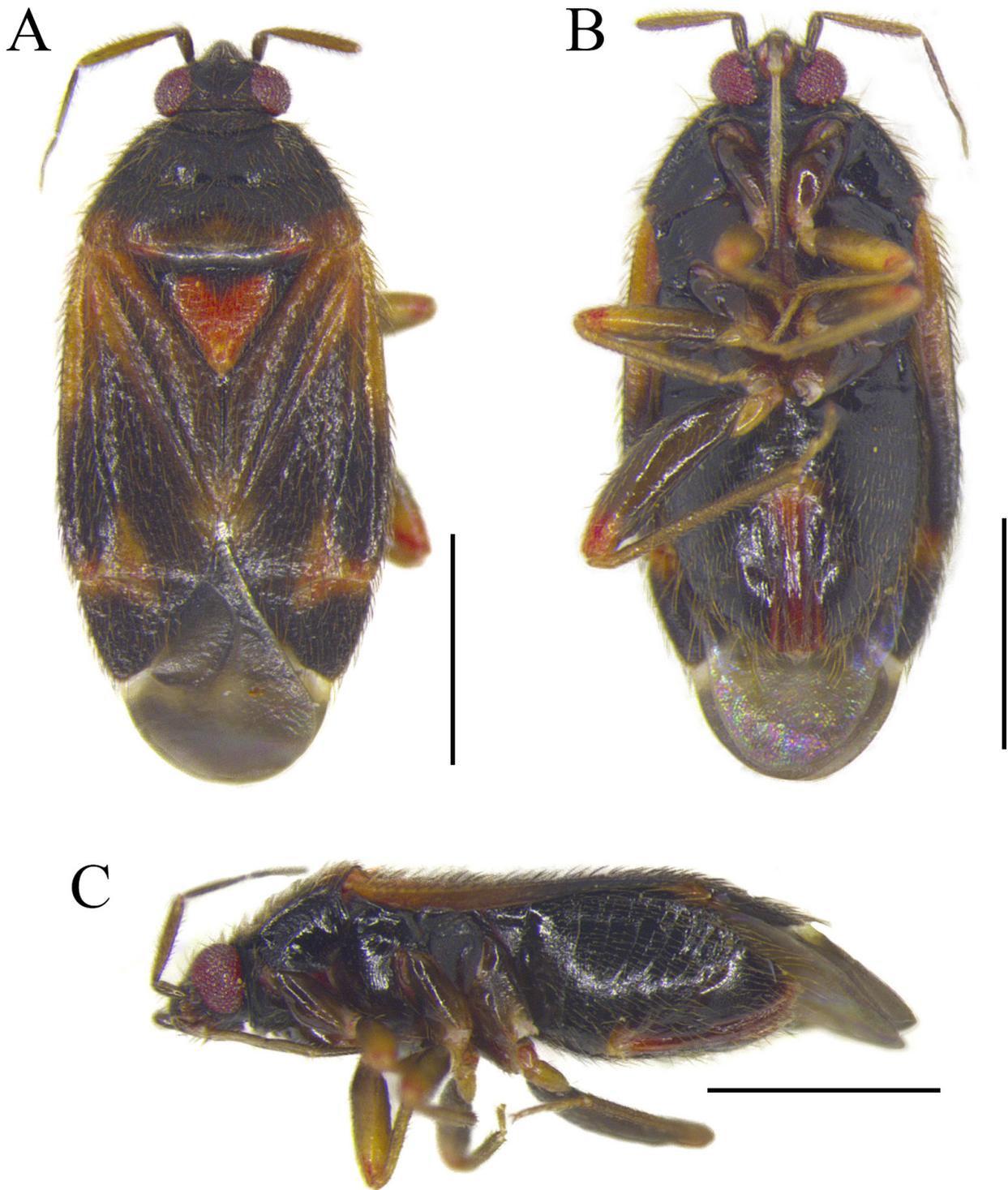


Fig. 1. Habitus images of *Kundakimuka cassisi*, new species, holotype in dorsal (A), ventral (B), and lateral views (C). Scale bars: 1 mm.

vertex width: 0.27; 1st antennal segment length: 0.14; 2nd antennal segment length: 0.53; 3rd antennal segment length: 0.34; 4th antennal segment length: 0.30; total antennal length: 1.30; mesial pronotal length: 0.66; posterior pronotal maximal width (straight): 1.33; anterior scutellar width: 0.88; mesial scutellar length: 0.55; commissure length: 0.58; maximal width across hemelytron: 0.77.

Male: unknown.

Etymology. This new species is named after Dr. Gerasimos Cassis (UNSW) in recognition of his outstanding contributions to the taxonomy and systematics of the family Miridae, particularly the tribe Termatophylini; a noun in the genitive case.

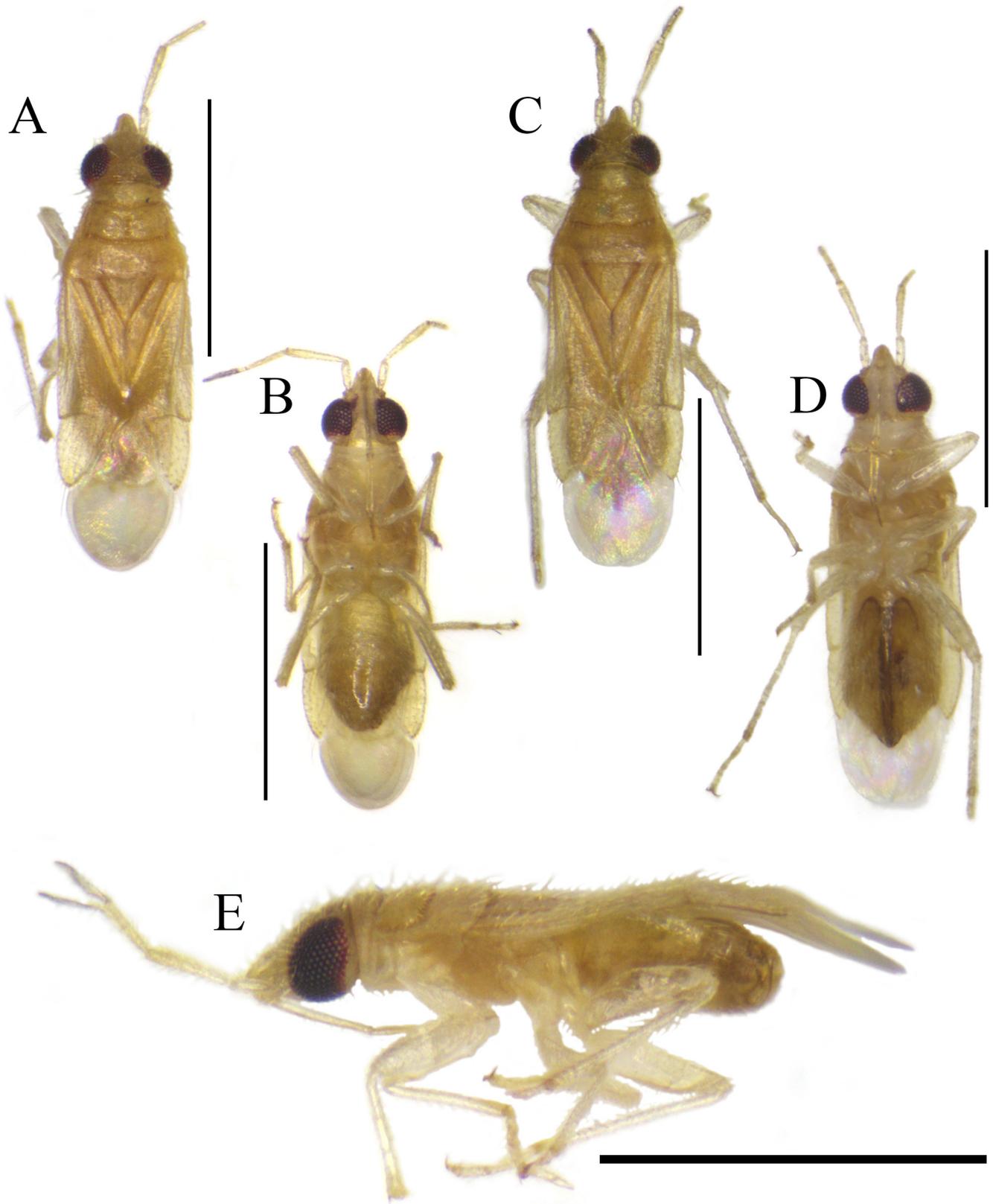


Fig. 2. Habitus images of *Termatophylum parvulum*, new species in dorsal (A, C), ventral (B, D), and lateral views (E). A, B, E: male, holotype; C, D: female, paratype. Scale bars: 1 mm.

Plant association. Unknown.

Distribution. Vietnam (Northern).

Remarks. As documented by Cassis (1995) and Cassis et al. (2011), enlarged hind femora in both sexes constitute a key diagnostic character of *Kundakimuka* within Termatophylini. Additionally, males possess a subapical spine or processes on the hind femur, rendering the generic assignment more definitive. In the present study, however, only a single female specimen was collected and available for examination. Nevertheless, the generic placement could be confidently determined within Termatophylini based solely on female external morphological characters, including the overall body shape, structure of the pronotum, pattern of punctures on the pronotum and hemelytra, and pretarsal structures, following the approach of Yasunaga & Ito (2024). At the same time, given that male morphological characters are highly diagnostic, the discovery of male specimens in the future would further corroborate the generic placement. This new species can be easily distinguished from its congeners by the bicoloured scutellum, which bears a heart-shaped marking medially and fuscous outer margins. In contrast, other known species of *Kundakimuka* have the scutellum almost entirely dark brown or fuscous with the pale apex (*Kundakimuka pallipes* (Miyamoto, 1965), *Kundakimuka queenslandica* Cassis, 1995, and *Kundakimuka arimotoana* Yasunaga & Ito, 2024), or a pale medial line (*Kundakimuka ribesi* Cassis et al., 2011), or are uniformly brown (*Kundakimuka carvalhoi* Cassis, 1995 and *Kundakimuka sudanensis* Cassis et al., 2011).

Kundakimuka cassis, new species, most closely resembles *K. queenslandica* in having a generally fuscous body and similar shape and position of the pale markings on the corium. However, it can be distinguished by: large body, approximately 3.5 mm (vs. smaller body, less than 3 mm); entirely dark brown first antennal segment (vs. basal half of first segment darker than apical half); and the scutellum with a large heart-shaped marking (vs. scutellum with an indistinct yellowish marking along posterior half of midline) (see p. 304 in Cassis (1995) and fig. 1 in Cassis et al. (2011)).

This species was previously presented as an undescribed taxon (as *Kundakimuka* sp.) in the phylogenetic analysis (Kim et al., 2023), for which molecular data were generated. The corresponding sequence data are available under GenBank accession numbers (COI: MZ715030; 28S rRNA: MZ756112; 16S rRNA: MZ756148; and 18S rRNA: MZ756171).

Genus *Termatophylum* Reuter, 1884

Termatophylum Reuter, 1884: 218 (Type species by monotypy: *Termatophylum insigne* Reuter, 1884, by original designation); Carvalho, 1957: 36; Linnavuori, 1974: 3; Cassis, 1995: 313; Nakatani, 1997: 593; Linnavuori & Harten, 2002: 225; Kim et al., 2017: 397; Varshney & Yeshwanth, 2018: 69.

Termatophylum parvulum, new species

(Figs. 2–3, 4B–D, 6A)

Type material. Holotype: male, VIETNAM: Hue City, Phu Loc, Bach Ma National Park, 16.2269°N, 107.8556°E, 510 m altitude, on *Ficus* sp., coll. J. Kim, 7 September 2025 (ZCDTU) (DTUHMM0065); Paratypes: 4 males, 6 females, same data as for holotype (ZCDTU) (DTUHMM0066–0075).

Diagnosis. Distinguished from its congeners by small body, with length less than 2 mm; dorsum entirely orange brown, unicolourous except for greyish membrane; antennae entirely unicolourous, orange brown; head about 0.8 times as long as wide; second antennal segment clavate in male and female, shorter than combined third and fourth segments, shorter than head width; single compound eye width as wide as vertex width; legs unicolourous, entirely orange brown; left paramere curved medially; hypophysis broad, apex blunt; endosoma with long, round and thick spicule and small J-shaped lateral sclerite.

Description. MALE: Colouration: Mostly orange-brown. **Head:** vertex, frons, clypeus, antennae, and labium entirely orange-brown. **Thorax:** pronotum, scutellum, corium, and cuneus entirely orange-brown; membrane subhyaline, greyish; legs entirely orange-brown. **Abdomen:** entirely orange-brown. Surface and vestiture: body somewhat moderate shiny, partly covered with sparse or dense setae; head mostly smooth, with minute protuberances; frons and clypeus sparsely covered with long setae; antennae densely covered with short erected setae, approximately as long as diameter of antennae (Fig. 3A–B); pronotum smooth, sparsely covered with setae; lateral and posterior margins of callosite punctate in a row; posterior margin of pronotal collar punctate in a row (Fig. 3C); scutellum smooth, sparsely covered with setae, lateral margins punctate in a row (Fig. 3D); hemelytra relatively densely covered with setae, punctate; anal vein of clavus punctate in a row; R+M vein punctate on corium in a row (Fig. 3G).

Structure: Body elongated, length 1.72–1.78. **Head:** prognathous, about 0.8 times as long as wide; vertex approximately as wide as single compound eye width; antennae short; first segment thick, longer than 1/3 second segment, shorter than vertex width; second segment gradually thickened apically, shorter than combination of third and fourth segments; third segment longer than fourth segment; labium reaching mid-coxae. **Thorax:** pronotum trapezoid, large, robust, longitudinal length about 0.75 times as long as basal maximal width, lateral margin straight, posterior margin sinuate; calli weakly swollen; pronotal collar broad, longitudinal length about 0.8 times as wide as vertex width; scutellum somewhat small, about 0.9 times as long as wide, length about 0.9 times as long as commissure; exposed part of mesoscutum narrow; lateral margin of hemelytra almost straight; cuneus relatively large and broad, cuneal outer margin about 0.45 times as long as embolial margin; legs normal in length; femur thick, fore femur as thick as hind femur. **Abdomen:** tapered to apex, reaching to apex of cuneus. **Genitalia:** pygophore asymmetrical, positioned sublaterally

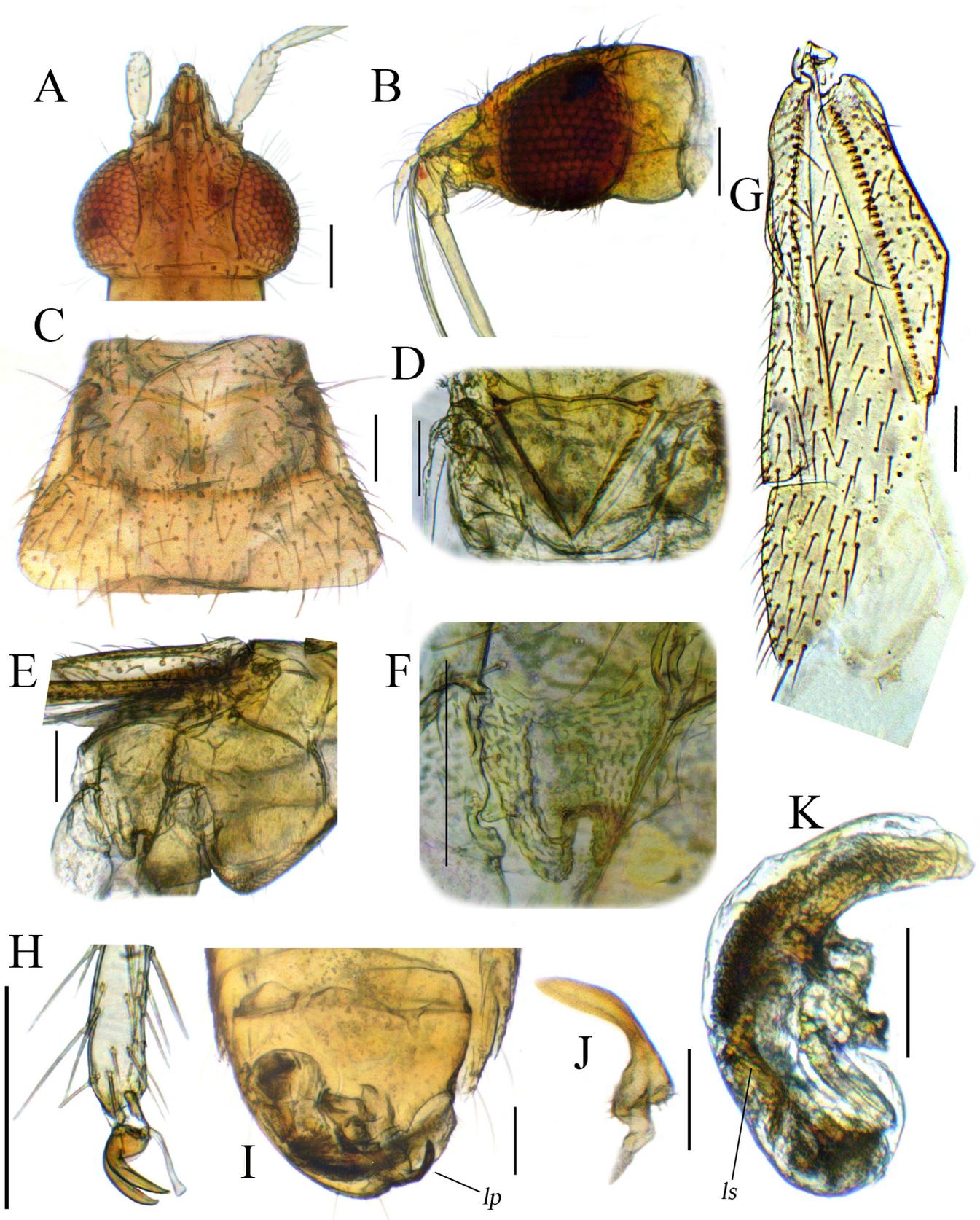


Fig. 3. Diagnostic characters of male *Termatophylum parvulum*, new species. A, B: head in dorsal and lateral views; C: pronotum; D: scutellum; E, F: metathoracic spiracles and evaporative areas; G: forewing; H: pretarsus; I: pygophore; J: left paramere; K: endosoma; lp: left paramere; ls: lateral sclerite. Scale bars: A–G, I–K: 0.1 mm; H: 0.05mm.



Fig. 4. Host plant of *Termatophylum parvulum*, new species, *Ficus* sp. (A), and alive individual (red arrows) (B–D).

(Fig. 3I); left paramere curved medially; hypophysis broad, its apex blunt (Fig. 3J); endosoma membranous with one spicule and one sclerite; spicule long, round and thick; lateral sclerite (ls) small, J-shaped (Fig. 3K).

Female: Colouration: same as in male. Surface and vestiture: same as in male. Structure: same as in male. **Genitalia:** Sclerotised rings (sr) on posterior wall, elongate oval, slightly rounded triangular, margins thick; interramal lobe and interramal sclerites not observed (Fig. 6A).

Measurements. Male (n=4)/Female (n=4) Body length, clypeus–apex of membrane: 1.72–1.78/1.81–1.89; head length, excluding collar: 0.26–0.28/0.22–0.28; head width, including compound eyes: 0.33–0.35/0.33–0.36; vertex width: 0.12–0.13/0.11–0.14; 1st antennal segment length: 0.10–0.12/0.11–0.13; 2nd antennal segment length: 0.23–0.25/0.23–0.25; 3rd antennal segment length: 0.18–0.19/0.17–0.18; 4th antennal segment length: 0.16–0.18/0.16–0.17; total antennal length: 0.64–0.74/0.67–0.73; mesial pronotal length: 0.35–0.37/0.38–0.40; posterior pronotal maximal

width (straight): 0.46–0.50/0.50–0.51; anterior scutellar width: 0.23–0.25/0.22–0.24; mesial scutellar length: 0.20–0.24/0.19–0.21; commissure length: 0.23–0.26/0.27–0.28; maximal width across hemelytron: 0.24–0.28/0.26–0.29.

Etymology. Named from the Latin adjective “parvulus”, meaning “very small”, referring to the remarkably small body size of this species.

Plant association. *Ficus* sp. (Moraceae) (Fig. 4A).

Biology. This new species was collected from the underside of leaves of a *Ficus* tree, where both adults and nymphs were found together (Fig. 4). The individuals were not distributed across the entire abaxial surface but were confined to the spaces among the setae along the midrib. Even during collection, they remained within these narrow passages rather than escaping to other areas, suggesting that their small body size may represent an adaptation to this microhabitat. This behaviour represents a distinct biological trait compared with other species of *Termatophylum*, which are mostly associated with flowers. No other arthropods were observed on the host plant at the time of collection, and thus the feeding habits of this species remain unknown.

A phyline mirid species, *Chimairacoris rakshmae* Yasunaga, Schuh & Cassis, 2015, which is known to be remarkably similar in overall appearance to members of the tribe Termatophylini, particularly in its slender, parallel-sided body shape. It is also associated with plants of the genus *Ficus* (see Yasunaga et al. 2015). According to Yasunaga et al. (2015), although *C. rakshmae* belongs to a subfamily clearly distinct from Termatophylini, it exhibited extensive external similarity to this tribe, thus was interpreted as a convergence in feeding habits and habitat. In this context, although no other arthropods were observed on the host plant during the present study, the biology of the new species may therefore involve ecological associations not only with the host plant itself but also with other insects inhabiting the same host plant, as has been suggested for *C. rakshmae*.

Distribution. Vietnam (Central).

Remarks. *Termatophylum parvulum*, new species has a very small body, with length less than 2 mm, and can be easily distinguished from most species of *Termatophylum* by its orange-brown and uniformly coloured body, whereas the dorsum of most congeners is dark brown or brown and/or the antennae are not entirely unicolourous. The new species is most similar to *T. ochraceum* Reuter & Poppius, 1912 from India, which also has a small body and exhibits a similar colouration. However, the new species can be readily separated from *T. ochraceum* by the following characters: body length approximately 1.7 mm (vs. body length exceeding 2 mm, about 2.3 mm); head about 0.8 times as long as wide (vs. head about as long as wide); in male, eyes of normal size, each compound eye as wide as vertex (vs. in male, eyes very large, each eye almost twice

as wide as vertex); second antennal segment clavate, shorter than head width (vs. second segment almost evenly wide, scarcely longer than head width).

We provisionally place this new species in *Termatophylum*, as it shares many morphological characters consistent with the diagnostic characters of the genus as presented in Cassis (1995). However, in several respects, including the shape of the pronotum, the structure and/or position of the metathoracic spiracles and evaporative areas, and the structure of the endosoma and parameres, the new species differs from characters observed in some *Termatophylum* species as presented in Cassis (1995). The morphology of the paramere provides one example of this inconsistency. Although the parameres have been described for some representatives of Termatophylini (see figs. 103–110 in Cassis (1995)), it does not exhibit a consistent genus-level pattern and is very similar to that of *Arygrotelaenus simoni* Reuter & Poppius, 1912 (fig. 103 in Cassis (1995)). Given that *Termatophylum* was originally established for the Ethiopian species, *Termatophylum insigne* Reuter, 1884, and that morphological data for most genera and species within Termatophylini remain insufficient, further study is required to assess the monophyly of this genus and to determine whether the observed characters represent intraspecific variation or taxonomically significant characters.

***Termatophylum orientale* Poppius, 1915**
(Fig. 5, 6B–C)

Termatophylum orientale Poppius, 1915: 9; Carvalho, 1957: 36; Nakatani, 1997: 596; Varshney & Yeshwanth, 2018: 69.

Material examined. VIETNAM: 1 female, Binh Dinh Province, An Lao District, 14.53487°N, 108.72937°E, 812 m altitude, by light trap, coll. T.S. Keetapithchayakul, 23 April 2025 (ZCDTU) (DTUHMM0087); 1 female, Gia Lai Province, Chu Pah District, La Khuoi, 14.2158°N, 107.9794°E, 655 m altitude, coll. J. Kim, 2 May 2025 (ZCDTU) (DTUHMM0092).

Diagnosis. Recognised by the following characters: dorsum mostly blackish brown; antennae partly pale brown to dark brown; first antennal segment entirely dark brown; second segment clavate, apical half dark brown; scutellum blackish brown, apex pale brown; ostiolar peritreme entirely dark brown, tinged with red; corium mostly blackish brown, anterior part paler; cuneus entirely blackish brown; membrane greyish, basal part near cuneus with subhyaline spots; coxa mostly dark brown tinged with red, apical part pale brown; fore femur entirely pale brown; apical half of mid femur tinged with red; hind femur tinged with red except for basal part; tibia entirely pale brown.

Description. See Nakatani (1997) for detailed redescription. **Female genitalia:** Sclerotised rings (sr) on posterior wall, oval, slightly rounded triangular, margins thick; interramal lobe and interramal sclerites not observed (Fig. 6B, C).

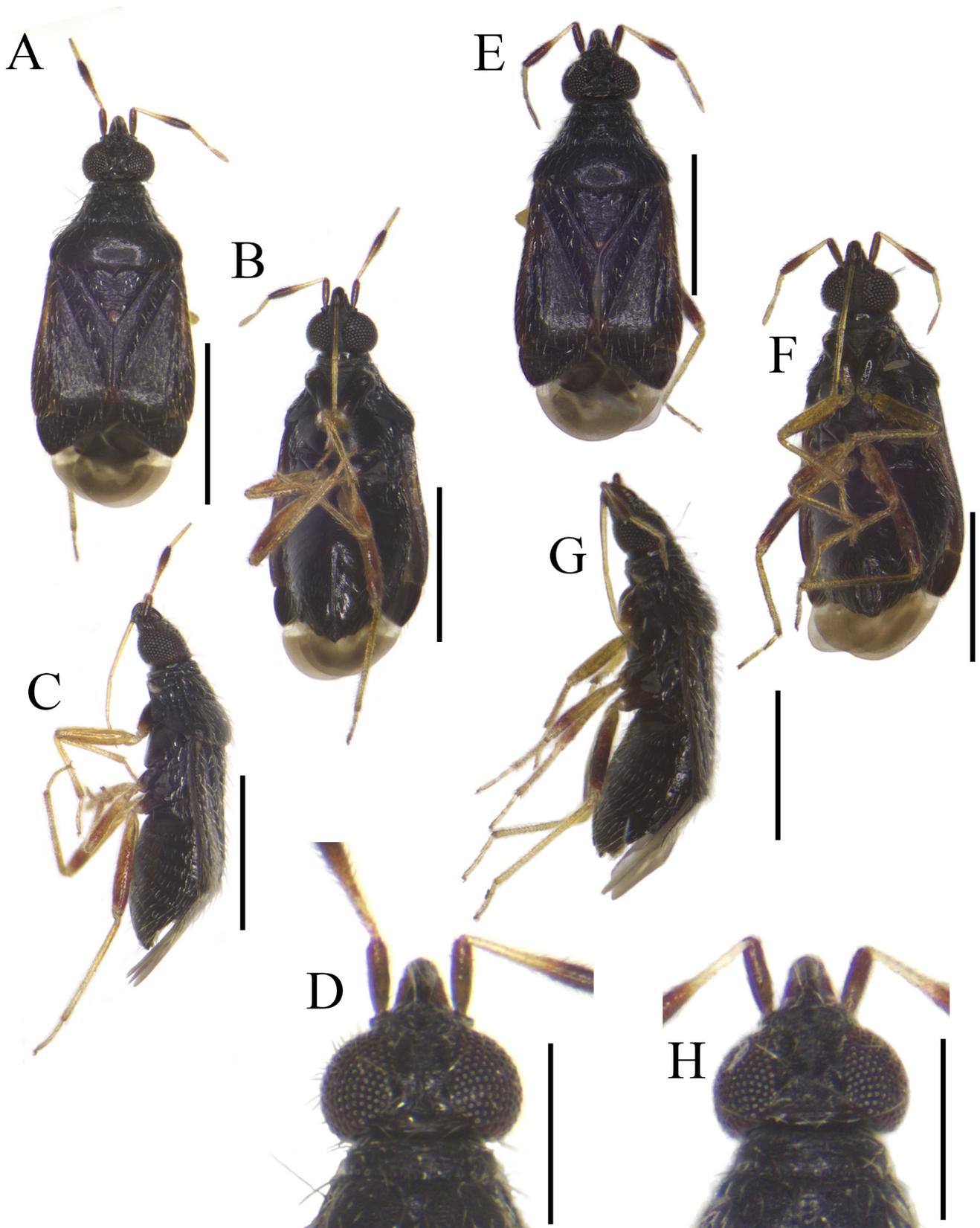


Fig. 5. Habitus images of the female *Termatophylum orientale* in dorsal (A, E), ventral (B, F), and lateral views (C, G), and head (D, H). Scale bars: A–C, E–G: 1 mm; D, H: 0.5 mm.

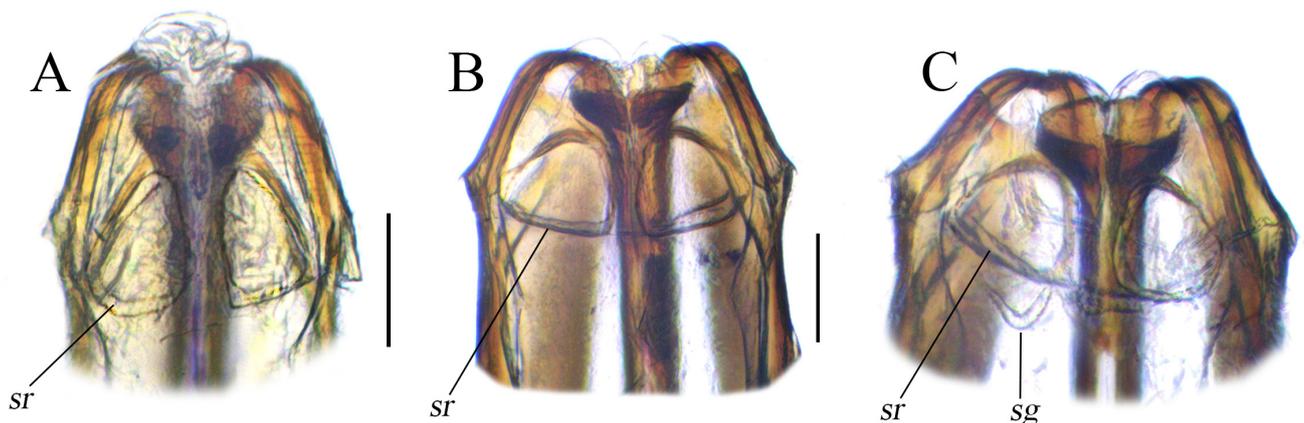


Fig. 6. Female genitalia of *Termatophylum parvulum*, new species (A), and *T. orientale* (B, C); sg: spermathecal gland; sr: sclerotised ring. Scale bars: 0.1 mm.

Measurements. Female (n=2); 1 female (Fig. 5A–D) Body length, clypeus–apex of membrane: 2.57; head length, excluding collar: 0.46; head width, including compound eyes: 0.48; vertex width: 0.17; 1st antennal segment length: 0.18; 2nd antennal segment length: 0.41; 3rd antennal segment length: 0.24; 4th antennal segment length: 0.20; total antennal length: 1.03; mesial pronotal length: 0.56; posterior pronotal maximal width (straight): 0.82; anterior scutellar width: 0.48; mesial scutellar length: 0.40; commissure length: 0.42; maximal width across hemelytron: 0.50; 1 female (Fig. 5E–H) Body length, clypeus–apex of membrane: 2.93; head length, excluding collar: 0.48; head width, including compound eyes: 0.54; vertex width: 0.16; 1st antennal segment length: 0.19; 2nd antennal segment length: 0.44; 3rd antennal segment length: 0.25; 4th antennal segment length: 0.22; total antennal length: 1.10; mesial pronotal length: 0.64; posterior pronotal maximal width (straight): 0.99; anterior scutellar width: 0.56; mesial scutellar length: 0.43; commissure length: 0.45; maximal width across hemelytron: 0.62.

Plant association. *Mangifera indica* (Anacardiaceae), *Carica papaya* (Caricaceae), *Peltophorum pterocarpum* (Fabaceae) (Varshney & Yeshwanth, 2018).

Distribution. Japan, Taiwan, Vietnam (Central Highlands, South-Central Coast, first record).

Remarks. Most species of *Termatophylum* can be distinguished by body colouration and size, antennal colouration and shape, and the presence or absence of an apical marking on the scutellum. In the present study, we identified the specimens listed above as *T. orientale* based on comparisons with descriptions and distributional information, as well as comparison with available type specimens of certain species.

However, there are notable differences between the two examined females, particularly in head structure and in the ratio between the width of the compound eye and the vertex (0.27 and 0.37, respectively; Fig. 5D, H). Nevertheless, when compared with the description and measurements of *T. orientale* by Nakatani (1997) and direct measurements of

the type specimen, this ratio appeared to fall near the median value (0.31). Considering that the relative size of the eyes has been regarded as an important diagnostic character in some *Termatophylum* species (Reuter & Poppius, 1912), further examination of additional male specimens and/or DNA sequence data will be required to confirm whether these individuals truly represent the same species, even though we tentatively treat the two specimens as conspecific herein.

Key to the Termatophylini species in Vietnam

1. Body elongate oval, fuscous with brownish markings; pronotum broad, lateral margin rounded; scutellum bicolorous with a medial heart-shaped marking; punctate on R+M longer than medial flexion line vein; hind femur enlarged, clearly thicker than fore femur.....*Kundakimuka cassisi*, new species
 - Body elongate; pronotum elongate, lateral margin almost straight or slightly constricted medially; scutellum unicolorous; punctate on R+M shorter than medial flexion line vein; hind femur pale brown or brown; hind femur almost as thick as fore femur ... 2 (*Termatophylum*)
2. Dorsum mostly blackish brown, approximately 2.5 mm; scutellum mostly blackish brown with pale apical marking; membrane greyish with subhyaline markings basally; legs partly brown and pale brown.....*Termatophylum orientale*
 - Dorsum unicolorous, entirely orange brown, small, approximately 1.7 mm; scutellum orange brown; membrane entirely greyish brown; legs orange brown.....*Termatophylum parvulum*, new species

ACKNOWLEDGEMENTS

We thank Tran Anh Duc, associate editor of the Raffles Bulletin of Zoology, and two anonymous reviewers, for comments and valuable suggestions on earlier drafts, which obviously improved this paper. First author (JK) is thankful to Dr. Le Nguyen Bao, Director of Duy Tan University, for supporting the field survey. The first author also thanks Dr. Tosaphol Saetung Keetapithchayakul (DTU) and Mr. Paul Hopkins, a friend of the first author, for providing a specimen of *Termatophylum orientale* and for helping prepare the plates, and for English editing. We also would like to

thank Dr. Le Tuan Anh (Mien Trung Institute for Scientific Research, Vietnam National Museum of Nature, Vietnam Academy of Science and Technology) for the identification of the host plant. Special thanks go to the Directorate of Bach Ma National Park for their assistance and permission. The corresponding author (SJ) acknowledges that this work was supported by the National Research Foundation of Korea (NRF) grant funded by the Korea government (MSIT) (RS-2024-00347409).

LITERATURE CITED

- Callan EMcC (1943) Natural enemies of the cacao thrips. *Bulletin of Entomological Research*, 34: 313–321.
- Carvalho JCM (1957) A catalogue of the Miridae of the world. Part I. *Arquivos do Museu Nacional, Rio de Janeiro*, 44: 1–158.
- Cassis G (1995) A reclassification and phylogeny of the Termatophylini (Heteroptera: Miridae: Deraeocorinae), with a taxonomic revision of the Australian species, and a review of the tribal classification of the Deraeocorinae. *Proceedings of the Entomological Society of Washington*, 97: 258–330.
- Cassis G & Eyles AC (2006) An overview of New Zealand Deraeocorinae with descriptions of a new genus and a new species of Termatophylini (Insecta: Heteroptera: Miridae: Deraeocorinae). *Tuhinga*, 17: 39–48.
- Cassis G, Tataric N & Symonds C (2011) Systematics of the moth larval-feeding genus *Kundakimuka* Cassis (Hemiptera: Heteroptera: Miridae: Deraeocorinae: Termatophylini). *Heteropterus Revista de Entomologia*, 11: 215–225.
- Kim J, Min HK, Paek WK & Jung S (2017) Two new records of the subfamily Deraeocorinae (Hemiptera: Heteroptera: Miridae) from the Korean Peninsula. *Journal of Asia-Pacific Biodiversity*, 10: 396–398.
- Kim J, Cassis G & Jung S (2023) Phylogenetic analysis of the predatory plant bug subfamily Deraeocorinae (Hemiptera: Heteroptera: Miridae) based on molecular and morphological data. *Zoological Journal of the Linnean Society*, 197 (1): 246–266.
- Linnavuori RE (1974) Studies on African Miridae (Heteroptera). *Entomological Society of Nigeria Occasional Publications*, 12: 1–67.
- Linnavuori R & Harten Van A (2002) New species of the Miridae and Lygaeidae (Heteroptera) from Yemen. *Acta Universitatis Carolinae Biologica*, 46: 221–228.
- Miyamoto S (1965) Three new species of the Cimicomorpha from Japan (Hemiptera). *Sieboldia*, 3: 271–280.
- Myers JC (1935) Notes on cocoa-beetle and cocoa-thrips. 2. A useful predator on cocoa-thrips (*Heliothrips rubrocinctus*) in Jamaica. *Tropical Agriculture of Trinidad*, 12: 1–22.
- Nakatani Y (1997) A taxonomic study of the genus *Termatophylum* Reuter from Japan (Heteroptera, Miridae). *Japanese Journal of Entomology*, 65: 593–599.
- Poppius B (1915) H. Sauter's Formosa-Ausbeute: Nabidae, Anthocoridae, Termatophylidae, Miridae, Isometopidae und Ceratocombidae (Hemiptera). *Archiv für Naturgeschichte*, 80A (8): 1–80.
- Reuter OM (1884) Genera nova Hemipterorum. IV. Termatophylina nova subfamilia Anthocoridarum ex Aegypto. *Wiener Entomologische Zeitung*, 3: 218–219.
- Reuter OM (1910) Neue Beiträge zur Phylogenie und Systematik der Miriden nebst einleitenden Bemerkungen über die Phylogenie der Heteropteren-Familien. Mit einer Stammbaumtafel. *Acta Societatis Scientiarum Fennicae*, 37(3): iv + 167 pp.
- Reuter OM & Poppius BR (1912) Zur Kenntnis der Termatophyliden. *Öfversigt af Finska Vetenskaps-societetens Förhandlingar*, 54A(1): 1–17.
- Schuh RT (1975) The structure, distribution, and taxonomic importance of trichobothria in the Miridae (Hemiptera). *American Museum Novitates*, 2585: 1–26.
- Schuh RT (2002–2013) Online Systematic Catalog of Plant Bugs (Insecta: Heteroptera: Miridae). The American Museum of Natural History. <http://research.amnh.org/pbi/catalog/> (Accessed 17 October 2025).
- Schuh RT & Weirauch C (2020) True Bugs of the World (Hemiptera: Heteroptera). Classification and natural history. 2nd Edition. Siri Scientific Press, Manchester, 768 pp.
- Varshney R & Yeshwanth HM (2018) First record of *Termatophylum orientale* Poppius (Hemiptera: Miridae: Deraeocorinae) from India with biological note. *Journal of the Entomological Research Society*, 20(3): 67–73.
- Yasunaga T, Schuh RT, Janakiraman P & Cassis G (2015) A remarkable new genus and new species of the plant bug (Heteroptera: Miridae: Phylinae), inhabiting psyllid leaf margin roll gall on Indian banyan, *Ficus benghalensis*. *American Museum Novitates*, 3839: 1–15.
- Yasunaga T & Ito R (2024) A new species of *Kundakimuka* (Hemiptera: Heteroptera: Miridae: Deraeocorinae) from Zamami Island, Ryukyus, Japan. *Heteropterus Revista de Entomologia*, 24(1): 1–6.