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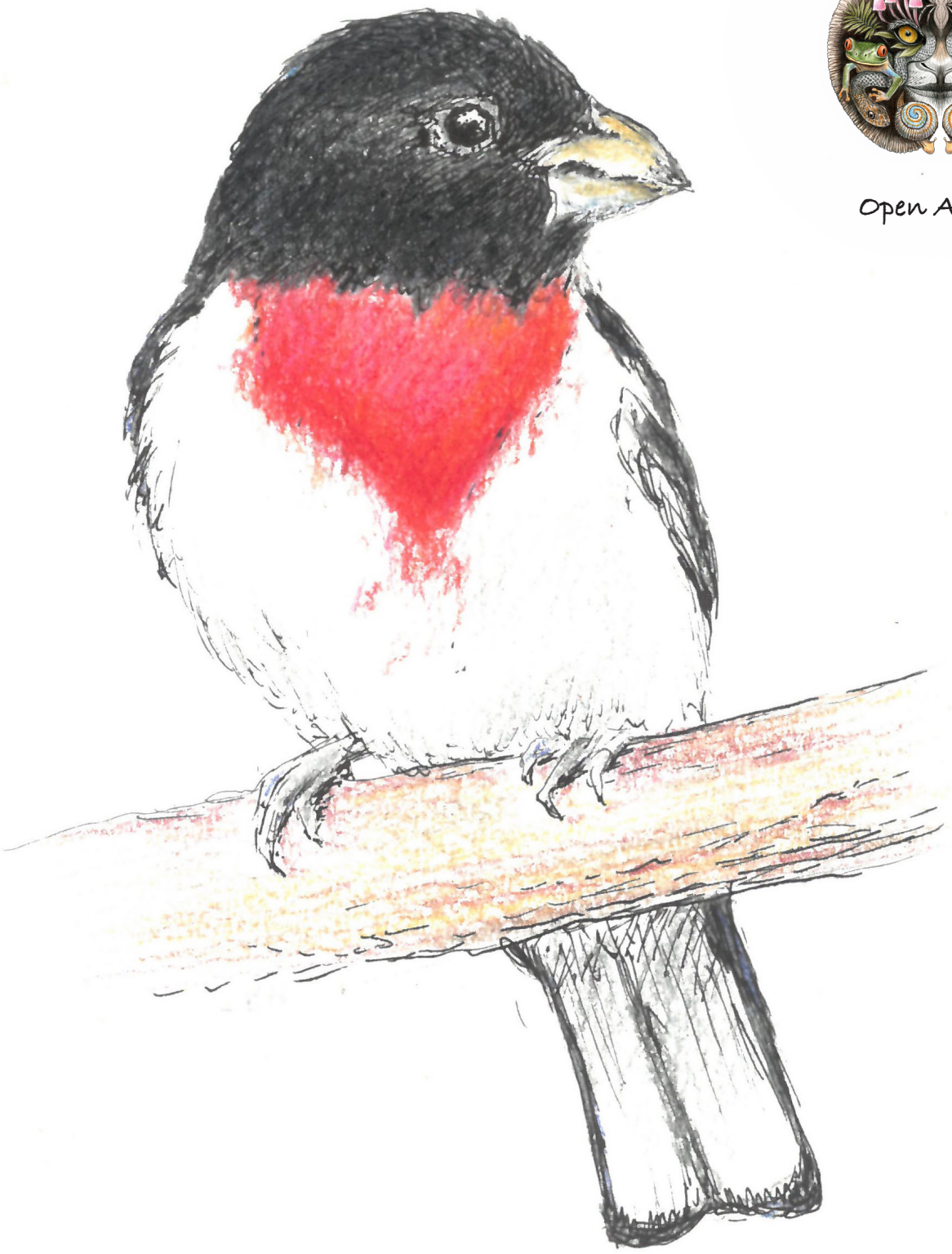
Journal of Threatened Taxa

10.11609/jott.2024.16.5.25119-25282
www.threatenedtaxa.org

26 May 2024 (Online & Print)
16(5): 25119–25282
ISSN 0974-7907 (Online)
ISSN 0974-7893 (Print)

Open Access



ISSN 0974-7907 (Online); ISSN 0974-7893 (Print)

Publisher
Wildlife Information Liaison Development Society
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Cover: Rose-breasted Grosbeak *Pheucticus ludovicianus*, pen & ink with colour pencil. © Lucille Betti-Nash.

Journal of Threatened Taxa | www.threatenedtaxa.org | 26 May 2024 | 16(5): 25220–25226

ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

https://doi.org/10.11609/jott.8931.16.5.25220-25226

#8931 | Received 28 January 2024 | Final received 15 May 2024 | Finally accepted 18 May 2024

COMMUNICATION

First report of *Lutevula hortensia* (Distant) (Heteroptera: Reduviidae: Emesinae) from India

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Abstract: An emesine bug, *Lutevula hortensia* (Distant), is recorded from India for the first time; type locality of this species is Sri Lanka and it was recently collected from Vellore, Tamil Nadu, in southern India. This is a rediscovery of the species after more than 50 years. Digital images of the species are presented along with comments on recent classification of Emesinae.

Keywords: Assassin bug, *Guithera*, Leistarchini, *Luteva*, *Proguithera*, thread-legged bug.

Editor: Jader Oliveira, Universidade de São Paulo, São Paulo, Brazil. **Date of publication:** 26 May 2024 (online & print)

Citation: Ismavel, V.A. & H.V. Ghate (2024). First report of *Lutevula hortensia* (Distant) (Heteroptera: Reduviidae: Emesinae) from India. *Journal of Threatened Taxa* 16(5): 25220–25226. https://doi.org/10.11609/jott.8931.16.5.25220-25226

Funding: Self-funded.

Competing interests: The authors declare no competing interests.

Author details: Vijay Anand Ismavel is a paediatric surgeon, presently missions consultant at the Christian Medical College, Vellore. He was the founder of the "Makunda Nature Club" during his 30 year stay in Assam and has done biodiversity documentation including publication of several articles. Hemant V. Ghate is retired professor of zoology interested in taxonomical work on some groups of insects.

Author contributions: VAI—noted and photographed this bug in live condition, collected / preserved this as specimen and reviewed manuscript. HVG—identified the bug, prepared phtographs of morphology and wrote first draft.

Acknowledgements: Hemant Ghate is indebted to the authorities of Modern College for providing facilities and encouragement; he is further thankful to Dr. Dávid Rédei (National Chung Hsing University, Taichung, Taiwan) for encouraging in various ways for work on this interesting group of bugs. The authors are grateful to Dr. Zhuo Chen (China Agricultural University, Beijing, China) for sharing with us an excellent image of the type and also for his suggestions on the first draft of this paper. We thank Dr. H. Sankararaman for his interest in insects that helped us in bringing yet another emesine bug to light. We also thank Dr. Miss Shruti Paripatyadar for preparing the photo-plates used in this paper.

INTRODUCTION

The subfamily Emesinae Amyot & Serville, 1843 that includes so called 'thread-legged assassin bugs', is one of the most remarkable and species rich subfamilies in the family Reduviidae, as is evident from the list in Catalogue of Reduviidae by Maldonado Capriles (1990). There are six tribes, about 90 genera, and 950 species of Emesinae (Wygodzinsky 1966; Schuh & Weirauch 2020) but new species continue to be discovered all over the globe. Further, as is discussed below, Standring et al. (2023) have considerably revised the classification that was proposed by Wygodzinsky (1966), some of the original tribes have been merged, new tribes added and former subfamily Saicinae is treated as tribe under Emesinae. Obviously, the number of genera and species, now under Emesinae, has also increased.

A single female emesine bug, collected from Vellore (Tamil Nadu, India) when attracted to light, was identified as *Guithera hortensia* Distant, 1906 based on Wygodzinsky (1966) and redescription given by Distant (1910). The original description given by Distant (1906) was also checked. Distant (1910) had synonymized *Lutevula lutea* Breddin, 1909 with *G. hortensia,* a synonymy that was later accepted by Wygodzinsky (1966) who subsequently treated *Lutevula* as a subgenus of *Guithera* and mentioned the species as *Guithera* (*Lutevula*) *hortensia.*

Villiers (1970), while describing new species of Emesinae from caves of Sri Lanka, rediscovered this species from Istripura cave near Hanguranketa (now Hanguranketha) and resurrected *Lutevula* as a genus on the basis of length of fore tarsus and wing venation.

Wygodzinsky (1966) had recognized three subgenera under *Guithera* (namely, *Guithera* Distant, 1906; *Proguithera* Wygodzinsky, 1966; & *Lutevula* Breddin, 1909) but, according to Rédei (2004), all three are treated as valid genera now and of these *Guithera* and *Lutevula* are closer to each other and form *Guithera-Lutevula* group. Recent keys to this group also identify our specimen as *Lutevula hortensia* (see Rédei 2004; Ishikawa & Naka 2016; Chen et al. 2021). In addition, we had a chance to compare our specimen with the images of the type (preserved at Natural History Museum, London), prepared by Dr. Zhuo Chen (China) and this further confirmed the identity of our specimen.

Distant (1906) defined the genus *Guithera* with *Luteva feana* Distant, 1903 as type species (see Distant 1903a,b for original description of *L. feana*) and described two new species from Sri Lanka, namely, *G. hortensia* and *G. nubifera*. The same two species and the characters of the genus *Guithera* were redescribed in Distant (1910). Of these species, *G. nubifera* is now treated as *Stenorhamphus nubiferus* (Distant) under Collartidini (see Wygodzinsky 1966). Distant did not give any illustration of *G. hortensia*, neither in original description nor in subsequent redescription. However, Breddin (1909) had given detailed description of his species *L. lutea* with a drawing of anterior half of body in lateral view – a drawing that matches with image of our specimen given here (see Image 2B). Villiers (1970), who reported the species again, also did not redescribe or illustrate it. Wygodzinsky (1966) illustrated habitus, male genitalia and a few other details of this species, based on holotype of *L. lutea* Breddin, deposited in Deutsches Entomologisches Institut (Müncheberg, Germany).

As the species has been adequately described by Distant (1906, 1910), and a detailed diagnosis of the genus has been given by Wygodzinsky (1966), the purpose of this note is to provide digital images and a brief redescription. It is true that Dispons (1970) listed *Lutevula* as a distinct genus (then under the tribe Orthungini Villiers, 1948 which is now treated as synonym of Leistarchini) but it was Villiers (1970) who categorically stated that *Lutevula* should not be treated as a subgenus of *Guithera* but must be resurrected as a valid genus.

Taxonomy

Heteroptera, Reduviidae, Emesinae, Leistarchini:

Genus *Lutevula* Breddin, 1909 (type species *Lutevula lutea* Breddin); (Distant 1910: 176 as synonym of *Guithera*); (Wygodzinsky 1966: 128 as subgenus of *Guithera*); (Dispons 1970: 220 tabulated); (Maldonado Capriles 1990: 101 Catalogued); (Rédei 2004: 308); (Ishikawa & Naka 2016: 188); (Chen et al. 2021: 355)

Lutevula hortensia

Guithera hortensia Distant (1906: 364); Distant (1910: 177).

Lutevula lutea Breddin: (1909: 303). Synonymized by Distant (1910: 177)

Guithera (Lutevula) hortensia: Wygodzinsky (1966: 127,128)

Lutevula hortensia**:** Villiers (1970: 325); Maldonado Capriles (1990: 103).

Lutevula hortensia**:** Rédei (2004: 314 in key)

Lutevula hortensia**:** Ishikawa & Naka (2016: 191 in key)

Lutevula hortensia**:** Chen et al. (2021: 362 in key)

MATERIALS AND METHODS

Methods of study, photography and measurement follow earlier work (Ranade & Ghate 2023).

Material examined: one female, attracted to light. The specimen was photographed and collected from the campus of the Christian Medical College, Bagayam, Vellore, Tamil Nadu (Latitude 12.876186 and Longitude 79.130975) INDIA; collector Dr. Vijay Anand Ismavel; date: 6.x.2023.

Measurements (in mm): Total length—8 | dorsally head length—1.15 | head width including eyes—0.75 | interocular width—0.40 | laterally anteocular length—0.50 | postocular—0.18 | eye diameter—0.42 | antenna total length—11.50 | I antennomere—5 | II—3 | III+ IV—3.5 | labium I visible segment— 0.9, II—0.75, III—1.25 | pronotum dorso-median total length—1.45 | anterior lobe—0.63 | posterior lobe—0.83 | pronotal width at humerus—1.30 | width at anterior angles—1.0 | forewing length—5.25 | fore leg coxa—2.0 | femur—3.0 | tibia—1.4 | tarsus—1.1 | mid leg coxa—0.5 | femur—5.5 | tibia—8.0 | tarsus + claw—0.3 | hind leg coxa—0.5 | femur—7.5 | tibia—11.5 | tarsus+claw—0.3 | abdomen—3.5

Brief redescription of female

Medium sized thread-legged bug. Overall colour brown, some parts dark brown to blackish. Head brown, eyes black, labium with visible first two segments light brown while third segment dark brown laterally; antennae with first two antennomeres dark brown while third and fourth pale, with indistinct boundary between them. Anterior lobe of pronotum pale brown dorsally as well as ventrally; posterior lobe dark brown to black dorsally in posterior one third part; scutellum blackish; narrow basal part of forewing and nearly half of posterior part fuscous, in-between area pale. Fore legs brown, tibia and tarsus darker than femur; mid and hind legs almost uniformly pale brown. Abdomen partly fuscous to dark brown in posterior half, especially laterally, remaining part brown, as illustrated here with live and preserved bug (Image 1A–D). All body covered with fine, yellowish, adpressed setae which are slightly denser on ventral side, especially genital region.

Head fusiform, clypeus elevated, anteocular narrowed anteriad and longer than postocular, postocular region semi-globose dorsally as well as ventrally; transverse dorsal sulcus or interocular furrow indistinct, shallow, situated near posterior border of eye; eyes large, vertically elliptical. Antennae inserted at anterior end of head, longer than body, first antennomere longest, first and second antennomeres thicker than remaining two antennomeres. Labium straight, moderately thick, bent under head, first two visible segments subequal, third visible longest (Image 2A).

Pronotum saddle like, nearly covering mesonotum except for small basal region, with deep transverse depression marking anterior and posterior lobes; anterior lobe convex dorsally, somewhat smooth and shining, with distinct median longitudinal sulcus, slightly shorter than posterior lobe when measured dorso-medially; posterior lobe dull, rugulose punctate, especially in posterior dark area, with one small, rounded bulging or nodule on each side laterally, just behind transverse depression (Image 2B, C). Prosternum depressed, flattish, its posterior margin rounded; meso- and metasternum slightly gibbous, with carina in between, this carina partly extends behind on to metasternum (Image 2D).

Forewings broad, just passing tip of abdomen (Image 2G). Hind wings very transparent, venation very difficult to discern except under very weak light.

Fore legs stout, fore coxa slightly shorter than femur, femur with usual anteroventral and posteroventral series of spiniferous setae as well as one accessory discal row of short black denticles (Image 2E,F). Tibia and tarsus together shorter than femur; tarsus one segmented, claw tiny. Mid and hind legs typical of emesine bugs, very slender and long, hind femora passing abdominal apex.

Abdomen as broad as thorax at base, broadened in middle but slightly narrowed in genital region. Female genitalia not dissected; in situ view of genitalia in postero-ventral aspect is shown here (Image 2H). Various parts, such as tergite 9, gonocoxae 8 (gcx 8), gonapophysis (gap 8), proctiger (pr) and sternum are labelled; syngonapophysis and other boundaries are not clear due to small size and setae.

DISCUSSION

Emesinae are an interesting group of reduviids that are receiving attention in recent years. In a monograph on Emesinae, Wygodzinsky (1966) recognized six tribes: Collartidini Wygodzinsky, 1966; Leistarchini Stål, 1862; Deliastini Villiers, 1949; Metapterini Stål, 1874, Emesini Amyot & Serville, 1843, and Ploiariolini, Van Duzee, 1916. Very recently, Standring et al. (2023) treated the subfamilies Saicinae Stål, 1859 and Visayanocorinae Miller, 1952 as tribes under Emesinae, based on

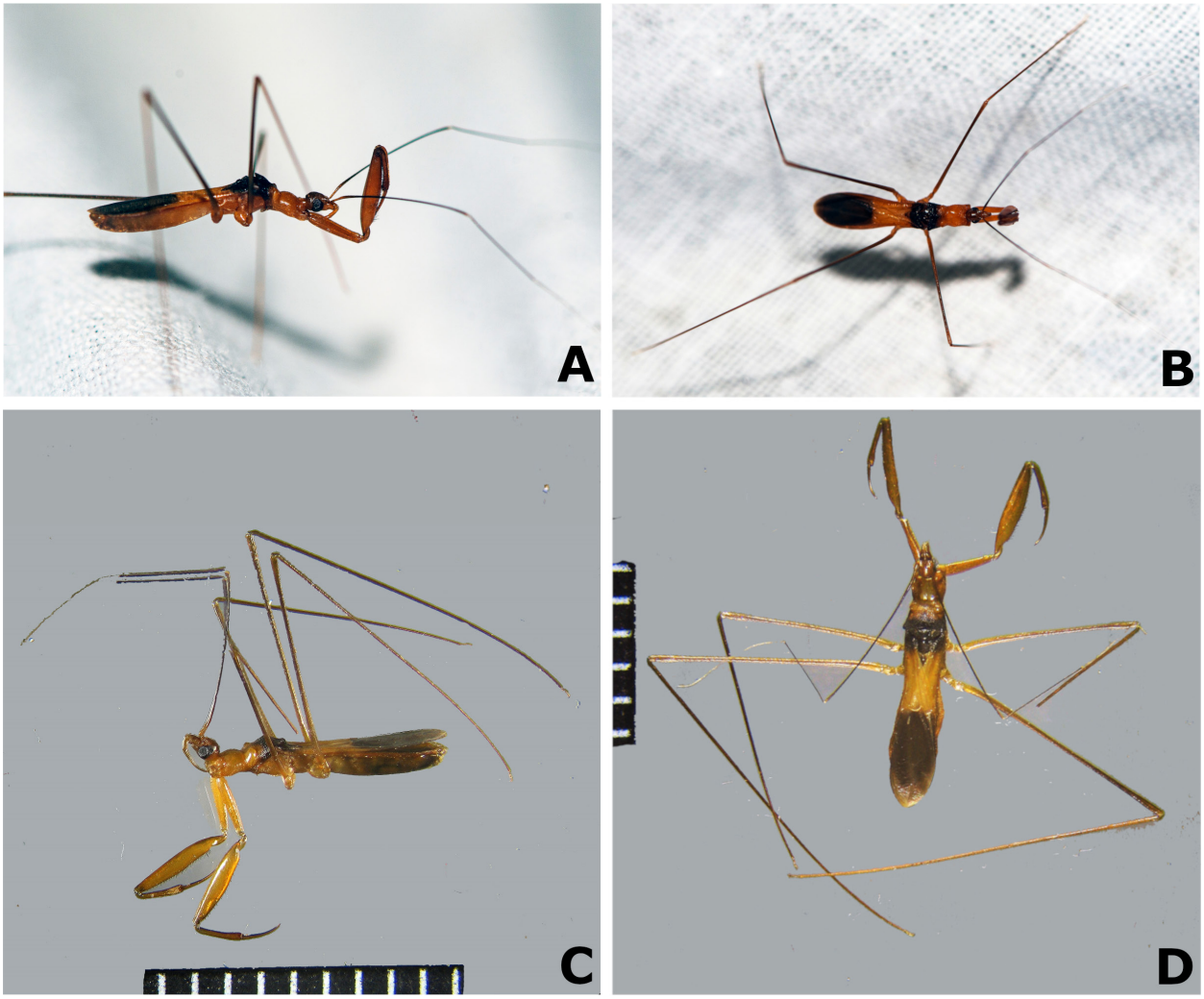

Image 1. *Lutevula hortensia* Distant, female habitus: A & B—lateral and dorsal view of live bug, respectively| C & D—lateral and dorsal view respectively, of preserved specimen. Scale: mm scale. © A & B—Vijay Anand Ismavel | C & D—H.V. Ghate.

extensive work on morphology as well as some marker genes. This so called "Emesine Complex" now is said to include over 1,000 species and the currently recognized tribes under Emesinae are: Collartidini Wygodzinsky, Leistarchini Stål, Visayanocorini Miller, Emesini Amyot & Serville, Oncerotrachelini Standring et al., 2023 and Saicini Stål. Former tribes like Metapterini and Ploiariolini are now treated as synonyms under Emesini. Deliastini were already treated as a junior synonym of Metapterini (see Castro-Huertas et al. 2020; Standring et al. 2023).

As mentioned above, based on comparison of images, our specimen matches exactly with the type and with original description, so there is no doubt about the identity of our specimen. All recent keys cited above also lead to the same species. The nodule or small bulging laterally on posterior lobe of pronotum is also seen in *Guithera feana, Proguithera kiinugama* Ishikawa & Naka, 2016 and *Proguithera caspersi* Chen, Li & Cai, 2021 (see Wygodzinsky 1966; Ishikawa & Naka 2016; Chen et al. 2021). Only the forewing venation was illustrated by Wygodzinsky (1966) for this species and it is also identical, as shown here (see Image 2G). Hindwing is very transparent but its venation, studied under subdued light, appears to be the same as that of *Proguithera caspersi*, as illustrated by Chen et al. (2021). Forewing venation, as illustrated for two species of *Proguithera* (Ishikawa & Naka 2016; Chen et al. 2021), is also not significantly different from that of *L. hortensia*. Female genitalia of *L. hortensia* in situ are similar to that described for *Proguithera drescheri* Wygodzinsky, 1966 (see Wygodzinsky 1966).

Since *Guithera*, *Proguithera*, and *Lutevula* are closely related genera (see Rédei 2004; Ishikawa & Naka 2016;

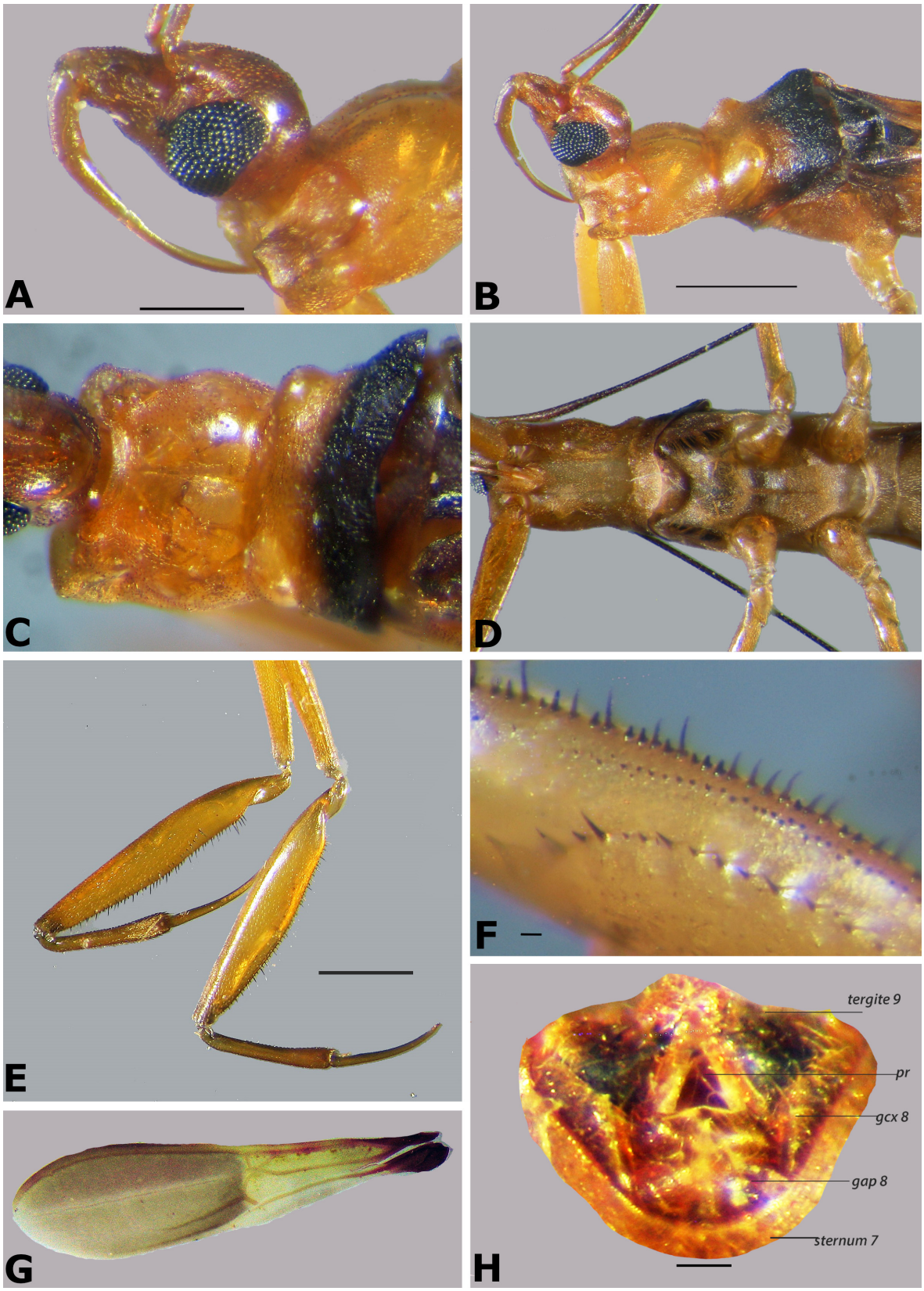

Image 2. ***Lutevula hortensia*** **Distant, female structure: A—head, lateral view, scale bar 0.5 mm | B—head with pronotum, lateral view, scale bar 1 mm | C—pronotum, dorsal view | D—thorax, ventral view | E—fore leg femur, tibia and tarsus, scale bar 1mm | F—fore femur ventral view, scale bar 0.1 mm | G—fore wing, actual size 5.25 mm | H—female terminalia in postero-ventral aspect, scale bar 0.25 mm. Abbreviations: gcx 8 = gonocoxite 8 | gap 8 = gonapophysis 8 | pr = proctiger. © H.V. Ghate.**

Chen et al. 2021), we are providing a list of all known species under these three genera. There are just six species described in about 120 years. The differences in these three genera are very small and characters of the genera not well-defined (see Ishikawa & Naka 2016); for these reasons we feel that Wygodzinsky (1966) was perhaps right in treating these all as subgenera of *Guithera*; additional work involving molecular data is essential to find out their true phylogenetic relationship.

The species *Lutevula hortensia* has not been reported again, for more than 50 years, since the record by Villiers (1970), even from Sri Lanka. For this reason, its presence in India is an interesting find as well as the first report of this genus / species from India.

The earlier checklists of Reduviidae of India (Ambrose 2006; Mukherjee et al. 2020) do not record *Lutevula hortensia* as a species found in India; Ambrose (2006) erroneously lists the species as a synonym under *G. feana*. It must also be noted here that, although the other species *G. feana* is listed by Ambrose (2006) and Mukherjee et al. (2020) as found in India, no definite locality name or reference is provided so it is uncertain if *G. feana* is present within the present Indian territory, as there is no authentic report with details / images of the specimen/s. Thus *L. hortensia* is possibly the only species, from among these three closely related genera, that is so far recorded from India.

It is interesting that *L. hortensia*, another Sri Lankan species, is collected from India after a prolonged gap. Although Sri Lankan faunal elements are regularly noted from India subsequently, for example recent record of an Emesinae bug *Gardena melinarthrum* Dohrn, 1860 from India as well as from Sri Lanka after a long gap (see Hiremath et al. 2022; Ranasinghe & Ghate 2022), lack of surveys and lack of expertise is probably the main reason for delays in recording such occurrences. Emesinae from India are being explored in recent years, as mentioned earlier (Ghate et al. 2019, 2021), and there are still many species that need attention. There are at least four more emsines that will be soon added to the Indian fauna and the list of Indian Emesinae will be updated (H.V. Ghate personal, unpub. data).

List of species under *Guithera*, *Lutevula*, and *Proguithera*

(recent keys are available, as cited above, hence not repeated here)

1. Guithera feana (Distant, 1903) (type locality: MYANMAR : Bhamo)

2. Lutevula hortensia (Distant, 1906) (type locality: SRI LANKA: Peradeniya)

3. Proguithera drescheri Wygodzinsky, 1966 (type locality: INDONESIA: Java, Dreangar, Tangkoeban Prahoe)

4. Proguithera inexpectata Rédei, 2004 (type locality: AFGHANISTAN: Nuristan)

5. Proguithera kiinugama Ishikawa & Naka, 2016 (type locality: JAPAN: The Ryukyus, Ishigaki-jima Is.)

6. Proguithera caspersi Chen, Li & Cai, 2021 (type locality: CHINA, Hainan, Baisha)

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NAAS rating (India) 5.64

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Journal of Threatened Taxa

www.threatenedtaxa.org

ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

May 2024 | Vol. 16 | No. 5 | Pages: 25119–25282
Date of Publication: 26 May 2024 (Online & Print)
DOI: 10.11609/jott.2024.16.5.25119-25282

Publisher & Host

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