European Journal of Taxonomy 602: 1–40
https://doi.org/10.5852/ejt.2020.602
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ISSN 2118-9773
www.europeanjournaloftaxonomy.eu
2020 · Constant J.

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Research article

urn:lsid:zoobank.org:pub:D11E0841-00AF-4A10-BC58-AB57828AE6F1

Revision of the Eurybrachidae (XV). The Oriental genus *Purusha* Distant, 1906 with two new species and a key to the genera of Eurybrachini (Hemiptera: Fulgoromorpha: Eurybrachidae)

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Abstract. The Oriental genus of Eurybrachidae (Hemiptera, Fulgoromorpha) *Purusha* Distant, 1906 is reviewed and a key to the genera of Eurybrachini is given. Two new species, *P. bellissima* sp. nov. and *P. vietnamica* sp. nov. are described from Myanmar and North Vietnam, respectively. *Purusha rubromaculata* Distant, 1906 is proposed as a junior synonym of *P. reversa* (Hope, 1843). All species are illustrated, including all type specimens and the male genitalia for the first time. Distribution maps, identification key to species and biological data are provided. The sexual dimorphism in the genus is discussed. Five species are currently placed in *Purusha*.

Keywords. Eurybrachinae, planthopper, Fulgoroidea, Auchenorrhyncha, sexual dimorphism.

Constant J. 2020. Revision of the Eurybrachidae (XV). The Oriental genus *Purusha* Distant, 1906 with two new species and a key to the genera of Eurybrachini (Hemiptera: Fulgoromorpha: Eurybrachidae). *European Journal of Taxonomy* 602: 1–40. https://doi.org/10.5852/ejt.2020.602

Introduction

The family Eurybrachidae Stål, 1862 is a small family of planthoppers (Fulgoromorpha Evans, 1946) with 41 genera and 201 species, representing only 1.7% of the genera and 1.5% of the species of Fulgoromorpha. The family is restricted to the Old World and distributed in the Afrotropical, Oriental and Australasian regions, with some species present in the southeasternmost part of the Palaearctic region in China; it is not recorded from Madagascar and Taiwan (Metcalf 1956; Bourgoin 2019).

Eurybrachidae represent a characteristic component of the planthopper fauna of the Oriental Region where it counts 12 genera and 82 species distributed in two subfamilies. The subfamily Platybrachinae Schmidt, 1908 is represented in the region by a single tribe, Ancyrini Schmidt, 1908, containing a single genus, *Ancyra* White, 1845. The second subfamily Eurybrachinae Stål, 1862 is present in the Oriental and Afrotropical regions and divided in three tribes; two of them, Eurybrachini Stål, 1862 (5 genera) and Frutini Schmidt, 1908 (1 genus) are restricted to the Oriental Region while the third one, Loxocephalini Schmidt, 1908, is represented in both the Afrotropical (3 genera) and Oriental (5 genera) regions, where the distribution of a few species slightly extends to the southeasternmost part of

the Palaearctic Region (Metcalf 1956; Fennah 1964; Constant 2004, 2006; Bourgoin 2019). All Oriental genera of Eurybrachidae are restricted to the Oriental Region and very little information on the biology and host plants is generally available. I gave the available data about *Klapperibrachys* Constant, 2006 (Constant 2006) and *Chalia* Walker, 1858 (Constant 2007), and Wang & Wang (2013) provided some data about *Loxocephala* Schaum, 1850. The genus *Eurybrachys* Guérin-Méneville, 1834, and notably the species *E. spinosa* Fabricius, 1798 and *E. tomentosa* Fabricius, 1775, was the subject of more serious studies on development, biology, host plants and parasites because it is considered a pest of some crops (e.g., cotton) in southern India (Lefroy & Howlett 1909; Fletcher 1917, 1920; Chatterjee 1932a, 1932b, 1933; Chatterjee & Bose 1934; Dover & Appanna 1934). When I started with the revision of the family Eurybrachidae (Constant 2004), it appeared necessary to redefine and review all existing genera. For a long time I regarded the genus *Purusha* Distant, 1906 as extremely difficult to revise because all species were described from single females. However, some key male specimens have recently become available, which now allows to complete a comprehensive revision of the genus *Purusha* as the fifteenth part of the ongoing revision of the family.

The present paper aims to fully revise the taxonomy of *Purusha*, to describe two new species and to provide a complete illustration, an identification key, a distribution map and biological data of all the species. Additionally, an identification key to the genera of Eurybrachini is given.

Material and methods

The types of all described species were studied and as much material as possible was examined. The genitalia were extracted after boiling the abdomen in a 10% solution of potassium hydroxide (KOH) at about 100°C. Some drops of saturated alcoholic Chlorazol black solution were added for contrasting (Carayon 1969). The pygofer was separated from the abdomen and the aedeagus dissected with a needle blade for examination. The whole was then placed in glycerine for preservation in a genitalia vial attached to the pin of the corresponding specimen. The description of the female genitalia follows Bourgoin (1993) with some additions from the studies of Soulier-Perkins (1997) and Soulier-Perkins & Bourgoin (1998) on the family Lophopidae Stål, 1866; the description of the wing venation follows Bourgoin *et al.* (2015). The metatibiotarsal formula provides the number of spines on (the side of the metatibia) the apex of the metatibia/apex of the first metatarsomere/apex of the second metatarsomere. The nomenclature follows Schmidt (1908) and Metcalf (1956). For each picture, a number of photographs were taken with a Canon 700D camera equipped with a Tamron 90 mm macro lens and stacked with CombineZ software. They were optimized with Adobe Photoshop CS3. Observations were done with a Leica MZ8 stereo-microscope. The distribution map was produced with SimpleMappr (Shorthouse 2010). For the transcription of the labels of the types, the wording on each single label is given verbatim placed within quotes, with supplementary information not on the label given in square brackets where appropriate. In the Results section, species are treated in alphabetical order. Geographical coordinates of the locations are given.

The measurements were taken as in Constant (2004) and the following abbreviations are used:

BF = maximum breadth of the frons
BT = maximum breadth of the thorax
BTg = maximum breadth of the tegmen
BV = maximum breadth of the vertex
LF = length of the frons in median line
LM = length of the mesonotum in median line
LP = length of the pronotum in median line
LTg = maximum length of the tegmen
LT = total length (apex of head to apex of tegmina)
LV = length of the vertex in median line

Acronyms used for the collections:

BMNH = Natural History Museum, London, United Kingdom
DNPT = Department of National Park, Wildlife and Plant Conservation, Bangkok, Thailand
MFNB = Museum für Naturkunde, Berlin, Germany
MHNL = Muséum d'Histoire naturelle de Lyon, France
MMBC = Moravské Zemské Muzeum, Brno, Czech Republic
NHRS = Naturhistoriska riksmuseet, Stockholm, Sweden
OUMNH = Hope Entomological Collections, Oxford University Museum of Natural History, Oxford, United Kingdom
RBINS = Royal Belgian Institute of Natural Sciences, Brussels, Belgium
RMNH = Nationaal Natuurhistorisch Museum (Naturalis), Leiden, The Netherlands
USNM = National Museum of Natural History, Washington DC, USA
ZIMG = Zoologisches Institut und Museum Greifswald, Greifswald, Germany
ZMPA = Polish Academy of Sciences, Museum of the Institute of Zoology, Warsaw, Poland

Results

Taxonomy

Class Insecta Linnaeus, 1758
Order Hemiptera Linnaeus, 1758
Suborder Auchenorrhyncha Duméril, 1806
Infraorder Fulgoromorpha Evans, 1946
Superfamily Fulgoroidea Latreille, 1807
Family Eurybrachidae Stål, 1862
Subfamily Eurybrachinae Stål, 1862

Tribe **Eurybrachini** Stål, 1862

The tribe Eurybrachini Stål, 1862 was defined by Schmidt (1908) with the following distinctive features: (1) clavus open; (2) claval veins not fused in clavus; (3) infra-ocular spine present.

This tribe is restricted to the Oriental region and contains five genera (Schmidt 1908; Metcalf 1956; Constant 2006): *Eurybrachys* Guérin-Méneville, 1834, *Messena* Stål, 1861, *Nicidus* Stål, 1858, *Purusha* Distant, 1906 and *Thessitus* Walker, 1862.

Identification key to the genera of Eurybrachini

1. Posterior wings wider than tegmina, with maximum width near base; general colouration of tegmina whitish, with a bright red marking on underside in males (Fig. 1F) ..... ***Thessitus*** Walker, 1862
– Posterior wings narrower than tegmina, sometimes as wide as tegmina but then with maximum width near apex; general colouration of tegmina not whitish, no bright red marking on underside of tegmina in males (Fig. 1A–E)..... 2

2. Posterior wings about as wide as tegmina, with maximum width near apex; general colour of tegmina chocolate brown (sometimes covered in white wax) (Fig. 1E) ..... ***Purusha*** Distant, 1906
– Posterior wings narrower than tegmina; general colour of tegmina not chocolate brown (Fig. 1A–D)..... 3

3. Tegmina very elongate and narrow, at least 3.3 times longer than wide (Fig. 1D) .... ***Nicidus*** Stål, 1858
– Tegmina not more than 2.8 times longer than wide (Fig. 1A–C) 4

4. Shorter, maximum length: 14 mm; membrane of tegmina short, representing less than ⅓ of tegmina length (Fig. 1A–B).....***Eurybrachys*** Guérin-Méneville, 1834
– Larger, minimum length: 20 mm; membrane of tegmina representing half of tegmina length (Fig. 1C).....***Messena*** Stål, 1861

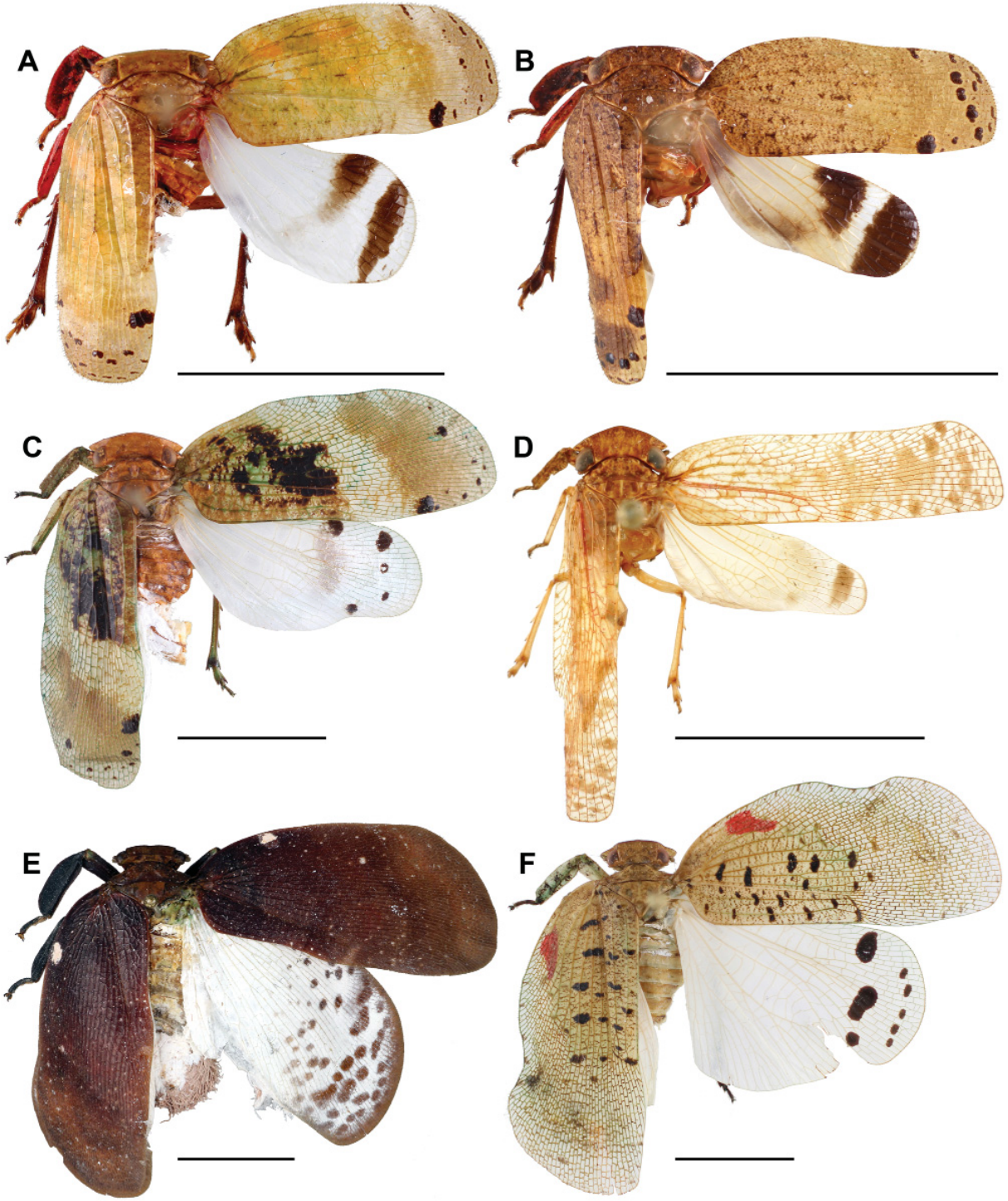

Fig. 1. Genera of Eurybrachini. **A**. *Eurybrachys* sp., ♀, dorsal view (USNM). **B**. *Eurybrachys* sp., ♂, dorsal view (USNM). **C**. *Messena* sp., ♀, dorsal view (RBINS). **D**. *Nicidus fusconebulosus* Stål, 1858, ♂, dorsal view (USNM). **E**. *Purusha reversa* (Hope, 1843), ♀, dorsal view (RBINS). **F**. *Thessitus* sp., ♂, dorsal view (RBINS). Scale bars = 10 mm.

Genus ***Purusha*** Distant, 1906

Purusha Distant, 1906a: 236 (type-species: *Eurybrachis* (sic!) *reversa* Hope, 1843, by monotypy).

Purusha – Distant 1906b: 203 [described]. — Schmidt 1908: 242 [placed in Eurybrachini]. — Metcalf 1956: 7 [catalogued]. — Constant 2008: 45 [notes].

Diagnosis

Medium to large sized eurybrachid (LT = 22–33 mm). The genus can be identified by the following combination of characters:

- Eyes with a strong spine beneath, surpassing level of eye laterally and visible from above (Fig. 16B, D).
- Tegmina broad, brown with very dense reticulum of veins and cross-veins, often densely covered with white wax (Figs 10A, 16A).
- Tegmina with costal margin not emarginate at posterior half and with apical margin obliquely rounded (Figs 10A, 16A).
- Clavus open posteriorly with claval veins Pcu and A1 running parallel to one another (Figs 15A, 16A).
- Posterior tibiae with 5 lateral spines (Fig. 15A–B).

Differential diagnosis

Among the Eurybrachini, the genus can be separated from

Eurybrachys by
(1) the much larger size (not surpassing 14 mm in *Eurybrachys*);
(2) the colour of the females (mainly green, yellow and red in *Eurybrachys*, Fig. 1A);
(3) the length of the posterior wings (much shorter than tegmina in *Eurybrachys*, Fig. 1A–B).

Messena by
(1) the much higher density of veins and cross veins on tegmina (at mid-length of tegmen, number of longitudinal veins > 25 in *Purusha*, Fig. 1E; < 20 in *Messena*, Fig. 1C);
(2) the narrower head: head narrower than pronotum in *Purusha* (Fig. 1E); as broad as pronotum in *Messena* (Fig. 1C);
(3) the colour of the tegmina: brown in *Purusha* (Fig. 1E); variegated with membrane whitish, semi-transluscent with black spots in *Messena* (Fig. 1C).

Nicidus by
(1) the shape of the tegmina, strongly elongate and with costal and sutural margins nearly parallel in *Nicidus* (Fig. 1D);
(2) the colour of the tegmina: brown in *Purusha* (Fig. 1E); variegated with membrane whitish, semi-transluscent with black spots in *Nicidus* (Fig. 1D);
(3) the length of the posterior wings (much shorter than tegmina in *Nicidus*, Fig. 1D).

Thessitus by
(1) the colour of the tegmina: in *Thessitus*: mainly whitish in females, whitish with a red marking on ventral side in males (Fig. 1F);
(2) the much higher density of veins and cross veins on tegmina (at mid-length of tegmen, number of longitudinal veins > 25 in *Purusha*, Fig. 1E; < 20 in *Thessitus*, Fig. 1F);
(3) the costal emargination on apical half of tegmina in *Thessitus* (Fig. 1F).

Etymology

'Purusha' is a sanskrit word, meaning, in Indian philosophy, 'spirit', 'person', 'self' or 'consciousness'.

Historical review

Distant (1906a), in his "*Fauna of British India*", erected the genus *Purusha* to accommodate one species, *Eurybrachys reversa* Hope, 1843, on the basis of Hope's (1843) illustration of the species (Fig. 18E). He did not formally describe the genus as no specimen was available to him at that moment. Later the same year (Distant 1906b), he described the genus together with a new species, *P. rubromaculata* Distant, 1906 and transferred *Messena paradoxa* Gerstaecker, 1895 to *Purusha*.

Schmidt (1908) placed *Purusha* in his new tribe Eurybrachini [main characters: (1) clavus open, (2) claval veins parallel, not fused behind half of clavus length] together with the genera *Eurybrachys* Guérin-Méneville, 1834, *Messena* Stål, 1861, *Nicidus* Stål, 1858 and *Thessitus* Walker, 1862.

Four species, all described from single females, were placed in *Purusha* in Metcalf's (1956) catalogue:

1. *P. reversa* (Hope, 1843): Hope (1843) described *Eurybrachis* (sic!) *reversa* from Silhet. The species was transferred from *Eurybrachys* to *Purusha* by Distant (1906a).
2. *P. paradoxa* (Gerstaecker, 1895): Gerstaecker (1895) described "*Messena* (?) *paradoxa*" from Java and stated that the species is clearly related to *Eurybrachys reversa*. The species was transferred to *Purusha* by Distant (1906b).
3. *P. rubromaculata* Distant, 1906: Distant (1906b) described this species from Siam, Chantabun [= Chantaburi].
4. *P. pulverosa* Distant, 1918: Distant (1918) described this species from Indo-China, Tonkin.

Description

Measurements and ratios. ♂: LT: 22.6–24.2 mm; LTg/BTg = 2.0–2.3; BV/LV = 3.8–4.5; BF/LF = 1.6–1.85; LP+LM/BT = 0.6–0.7. ♀: LT: 26.6–32.6 mm; LTg/BTg = 1.9–2.1; BV/LV = 4.3–4.4; BF/LF = 1.5–1.9; LP+LM/BT = 0.6–0.73.

General colouration. Brown, usually with white waxy markings; posterior wings often largely white and covered in white secretion in females.

Head. Narrower than thorax. Vertex 3.8–4.5 times as broad as long, concave and with anterior margin slightly curved in dorsal view. Frons 1.5–1.9 times as broad as long, slightly convex and with lateral angles well marked. Subocular spine strongly developed, surpassing external margin of eye and visible from above.

Thorax. About 1.35–1.6 times as broad as length of pro- and mesonotum taken together; pronotum shorter than mesonotum and with obsolete median carina; mesonotum with 3 longitudinal obsolete carinae.

Tegmina. Ground colour: brown. Nearly flat, elongate, about twice longer than broad (LTg/BTg = 1.9–2.3); slightly broadening from base to apex; apical margin obliquely rounded; dorsal and ventral sides often with white waxy markings, with markings more developed in females.

Venation. Pc+CP obsolete; ScP+R and MP forking very close to base and densely forking, resulting in a dense reticulum of veins and veinlets; CuA forking near basal third of tegmen; clavus open; CuP and PCu+A1 not merging together and strongly forked before reaching sutural margin beyond apex of clavus.

Hind wings. Elongate with apical margin rouned. About as large as tegmina and with anterior and posterior margins nearly straight in males; slightly larger and with anterior and posterior margin broadly rounded in females. Anal area developed, often bearing waxy secretion. Venation very dense.

Legs. Rather elongate. Pro- and meso- femora and tibiae dorso-ventrally flattened, foliaceous; metatibiae with 5 lateral and 9–10 apical spines. First metatarsomere with strong spine at each apicolateral angle; ventrally, large pad of microsetae and 11–13 spines arranged in two irregular rows. Second metatarsomere with ventral pad of microsetae. Third metatarsomere with narrow pad of microsetae. Metatibiotarsal formula: (5) 9–10/11–13/0.

Male genitalia (Figs 8, 11, 17, 21). Symmetrical. Pygofer rather massive, slightly higher than long in lateral view, with posterior margin projecting posteriorly in a laminate process on dorsal half. Anal tube large, dorsoventrally flattened, more or less oboval. Gonostyli elongate and strongly convex, bearing an apicodorsal process, often laminate and projecting megially, with several spines and a lateral hook at posterodorsal angle; ventral margin strongly emarginate, forming an opening leaving the aedeagus visible in ventral view. Phallobase robust, with lateral carinate process on each side, ventral, elongate, furcate process and pair of hooked, blunt processes slightly dorsally to furcate process. Aedeagus with apical elongate, often complicated upcurved processes and shorter, paired median portion.

Female genitalia (Fig. 2). Anal tube elongate, curved postero-ventrad, surpassing gonoplacs, v-shaped in cross section; gonoplacs large and unilobous; gonapophysis IX much smaller than gonoplacs; gonocoxae VIII well developed ventrally and pilose; anterior vagina placed ventrally and strongly smaller than posterior vagina; spermatheca attached ventrally; posterior vagina developed vertically and grooved; bursa copulatrix large, oval, attached dorsolaterally to and much larger than posterior vagina.

Sexual dimorphism. Males are about 20% smaller than females, often with reduced waxy markings on the tegmina, and with brown area of posterior wings more extended.

Distribution

Oriental Region (Fig. 4): from Bangladesh to Vietnam through Myanmar, Thailand and Laos, and south to Malaysia, Sumatra and Java. The genus is not recorded from Cambodia or Borneo to date.

Biology

The few observed specimens were sitting on leaves of bushes in the understorey of tropical rainforest. Nothing is known of the host plants and development of any species of the genus.

Species included

P. bellissima sp. nov. (Myanmar)
P. paradoxa (Gerstaecker, 1895) (Indonesia: Java, Sumatra)
P. pulverosa Distant, 1918 (Vietnam (Tonkin), Laos, Thailand)
P. reversa (Hope, 1843) (Bangladesh, Thailand, Malaysia)
= *P. rubromaculata* Distant, 1906
P. vietnamica sp. nov. (Vietnam (Tonkin))

Identification key to the species of *Purusha*

Males (not included: *P. bellissima* sp. nov.)

1. Posterior wings entirely whitish, covered with wax, without markings (Fig. 11A–B). Tegmina often completely covered with white wax, with concentric rows of small brown lines parallel to apical margin on apical third (Fig. 11A–B). Anterior part of pronotum yellowish (Fig. 11C)..... ***P. pulverosa*** Distant, 1918

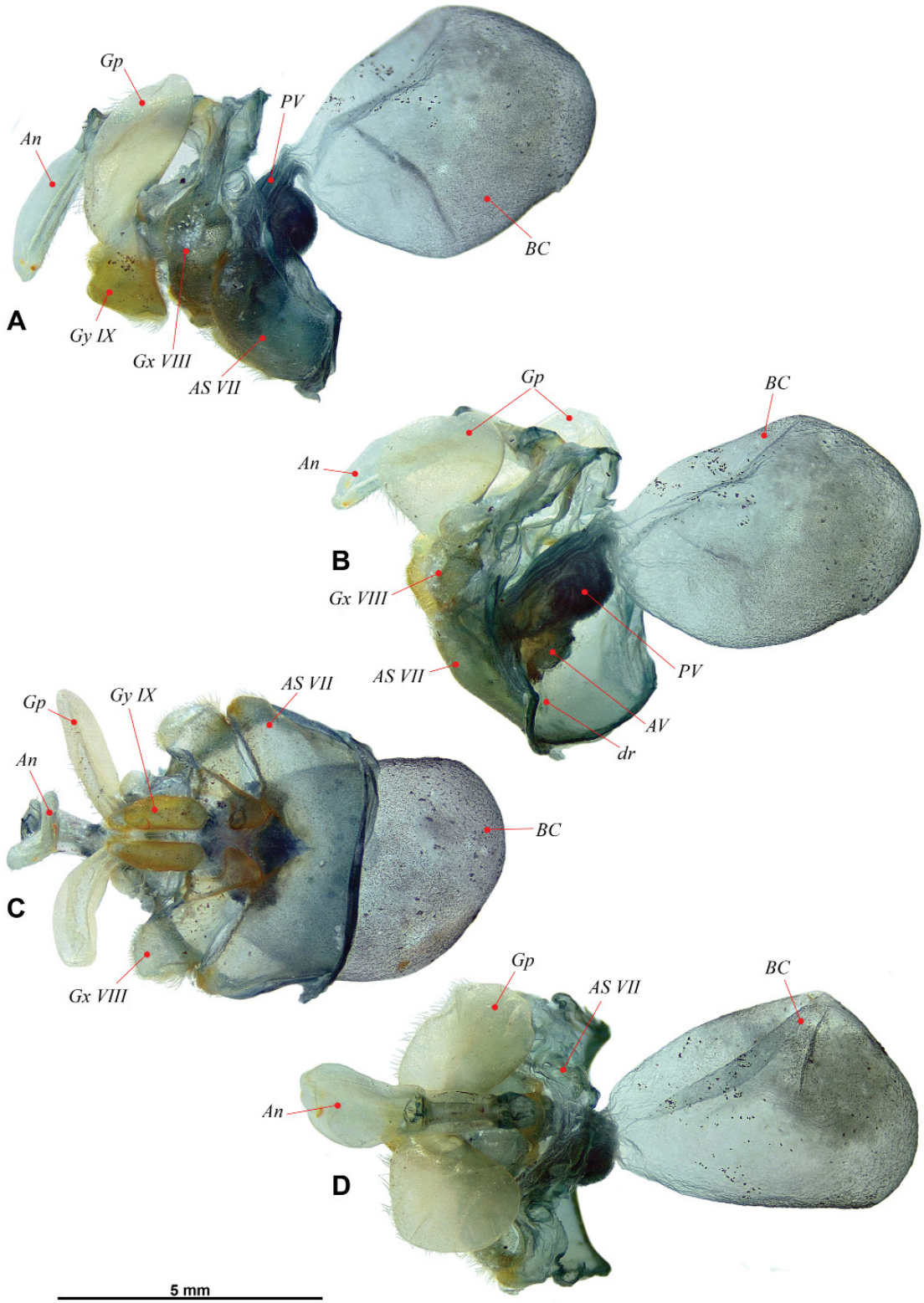

Fig. 2. *Purusha paradoxa* (Gerstaecker, 1895), female genitalia (RMNH). **A**. Lateral view. **B**. Anterolateral view. **C**. Ventral view. **D**. Dorsal view. Abbreviations: *An* = anal tube; *AS VII* = seventh abdominal sternite; *AV* = anterior vagina; *BC* = bursa copulatrix; *dr* = portion of ductus receptaculi (remaining portion of *dr* and spermatheca missing); *Gp* = gonoplac; *Gx VIII* = gonocoxa VIII; *Gy IX* = gonapophysis IX; *PV* = posterior vagina.

– Posterior wings brown or whitish, with dark brown spots or with brown lines on apical half arranged in concentric rows parallel to apical margin (Figs 6A–B, 15A–B, 19A–B). Tegmina with small black spots near apex or with brown lines on arranged in concentric rows parallel to apical margin (Figs 6A–B, 15A–B, 19A–B). Pronotum unicolorous, entirely brown or yellowish brown (Figs 6C, 15C, 19C)..... 2

2. Posterior wings pale brownish white with concentric rows of narrow brown stripes parallel to apical margin (Fig. 19A–B). Tegmina with concentric rows of narrow brown stripes parallel to apical margin (Fig. 19A–B)..... ***P. vietnamica*** sp. nov.*
– Posterior wings brown with numerous black-brown spots on posterior half (Figs 6A–B, 15A–B). Tegmina with small black spots on membrane, more or less arranged in concentric rows parallel to apical margin (Figs 6A–B, 15A–B)..... 3

3. Posterior wings with apico-costal angle regularly rounded (Fig. 6A–B). Ventral margin of gonostyli with internobasal process projecting posteriorly (Fig. 8B). Anterolateral spine of phallus much smaller than posterolateral one (Fig. 8F)..... ***P. paradoxa*** (Gerstaecker, 1895)
– Posterior wings with apico-costal angle slightly angularly rounded (Fig. 15A–B). Ventral margin of gonostyli without internobasal process projecting posteriorly (Fig. 17B). Anterolateral and posterolateral spines of phallus about the same size (Fig. 17G)..... ***P. reversa*** (Hope, 1843)

*the male of *P. bellissima* sp. nov. should probably key out here. Any identification of males of *P. vietnamica* sp. nov. needs verification of the male genitalia.

Females

1. Posterior wings entirely whitish, covered in wax, without markings (Fig. 10A–B). Tegmina without conspicuous white waxy spot, often completely covered with white wax (Fig. 10A–B). Anterior part of pronotum yellowish (Fig. 10D).....***P. pulverosa*** Distant, 1918
– Posterior wings whitish, covered with wax, with dark brown markings on apical half, often arranged in concentric rows parallel to apical margin (Figs 3A, C, 7A–B, 16A, C, 20A–B). Tegmina with or without conspicuous white waxy spot, sometimes completely covered with white wax (Figs 3A–C, 7A–B, 16A, C, 20A–B). Pronotum entirely brown.....2

2. Posterior wings with concentric rows of narrow brown stripes parallel to apical margin (Figs 3A, C, 20A–B). Tegmina without conspicuous white waxy spot (Fig. 20A) or with large white waxy spot along costal margin and transverse white waxy band near base (Fig. 3A–B).....3
– Posterior wings with numerous brown spots, sometimes merging together, more or less arranged in rows parallel to apical margin (Figs 5A, 7A, 13A, 14A, 16A). Tegmina with a conspicuous white waxy spot along costal margin or on disc (Figs 5A, 7A, 13A, 14A, 16A).....4

3. Tegmina with large, oval, white waxy spot along costal margin and transverse white waxy band near base (Fig. 3A–B).....***P. bellissima*** sp. nov.
– Tegmina without with large white waxy spot along costal margin and transverse white waxy band near base (Fig. 20A).....***P. vietnamica*** sp. nov.

4. Tegmina with numerous minute black spots in 2–3 rows along apical margin and conspicuous white waxy spot at half length, not touching costal margin (Figs 5A, 7A)..... .....***P. paradoxa*** (Gerstaecker, 1895)
– Tegmina without minute black spots and with conspicuous white waxy spot at basal third, along costal margin (Figs 13A, 14A, 16A).....***P. reversa*** (Hope, 1843)

Purusha bellissima sp. nov.
urn:lsid:zoobank.org:act:07D89973-A2DF-4274-B38E-C810FAFC91D6
Figs 3–4

Diagnosis

Male
Unknown.

Female (Fig. 3)
Immediately recognized by the combination of the following characters: (1) tegmina with a transverse white waxy band near base and a large, oval, white waxy spot along costal margin (but not reaching the latter at about mid-length) (Fig. 3A–B); (2) tegmina and posterior wings with concentric rows of narrow brown stripes parallel to apical margin (Fig. 3A–C); (3) ground colour of posterior wings turning to pale brown on apical half (Fig. 3A, C).

Etymology

The specific name is derived from the Latin adjective '*bellissima*', meaning 'most beautiful'. It refers to the colour and pattern of the tegmina and wings.

Material examined

Holotype (Fig. 3)
MYANMAR • ♀; Sadon; [21°59′ N, 95°07′ E]; alt. 1200 m; 28 Jun.–5 Jul.; Malaise leg.; in bad condition: head, prothorax, metasternum, abdomen and legs missing; "N. East Burma, Sadon, 1200 m., 28.6—5.7 *Malaise*", "*Purusha reversa* Hope Var, V. Lallemand det., 195"; NHRS.

Measurements and ratios

LT: ♀ (extrapolated; n = 1): 30.7 mm (LTg: 27.7); LTg/BTg = 1.9.

Description

Thorax (Fig. 3A–B). Mesonotum pale brown with 4 slightly darker dots along posterior margin and scutellum brown.

Tegmina (Fig. 3A–C). Brown, progressively more reddish towards base; reddish tint more visible ventrally; broad subbasal transverse band of white wax; at mid-length near costal margin, a larger oval spot covered in white wax and narrowly margined in black posteriorly; irregular marking of white wax ventrally corresponding to dorsal oval marking; numerous small spots of white wax on central portion of tegmina; on apical ⅓, several concentric, irregular and interrupted rows of narrow dark brown lines, parallel to apical margin of tegmen, number of rows varying from 2 anteriorly along costal margin to 7–8 in middle; costal and sutural margins subparallel; apical margin broadly rounded.

Hind wings (Fig. 3A, C). White basally turning to yellow-brown on distal half; distal half with numerous more or less transverse brown markings arranged in concentric rows parallel to distal margin towards apex; brown markings merging into irregular interrupted lines on distal ⅕; apical margin broadly rounded; postclaval margin with white waxy suffusions; inner part of cells semi-transluscent on basal white portion.

Distribution

Myanmar (Fig. 4).

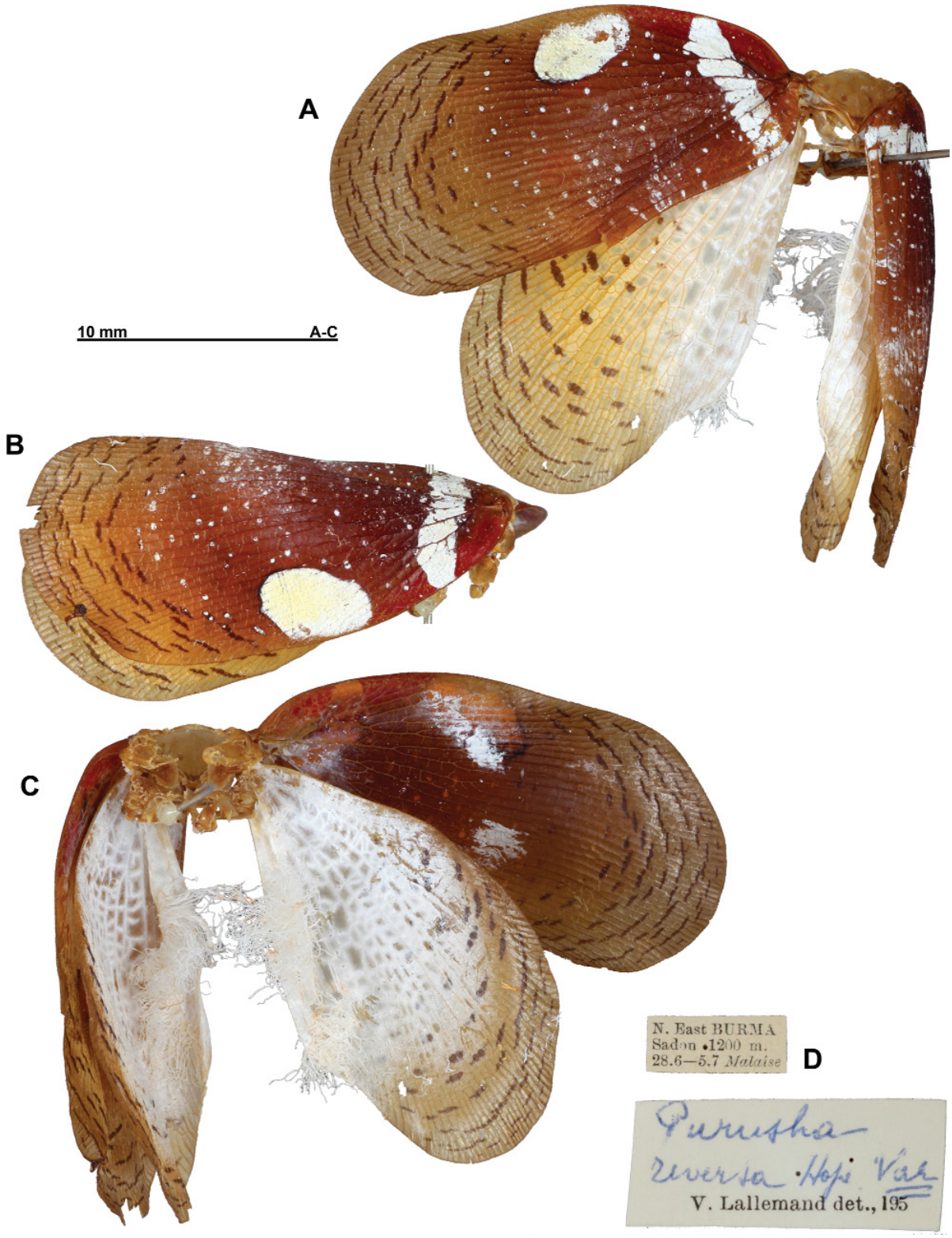

Fig. 3. *Purusha bellissima* sp. nov., holotype, ♀ (NHRS). **A**. Dorsal view. **B**. Lateral view. **C**. Ventral view. **D**. Labels.

Biology

The species was collected in mountainous region, at 1200 m a.s.l.

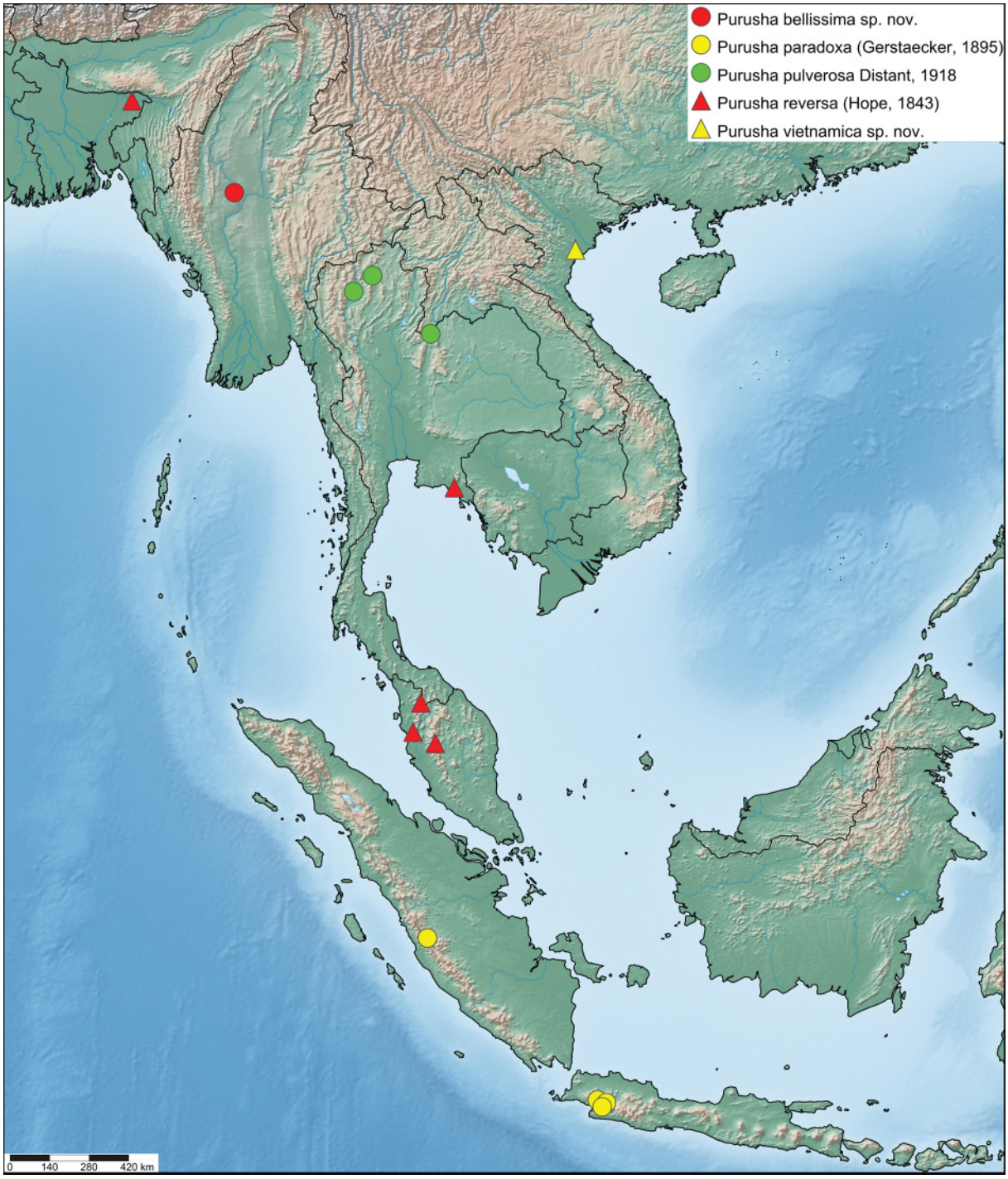

Fig. 4. *Purusha* spp., distribution map.

Purusha paradoxa (Gerstaecker, 1895)
Figs 2, 4–8

Messena (?) *paradoxa* Gerstaecker, 1895: 33 [described; allied to *Purusha reversa*].

Purusha paradoxa – Distant 1906b: 204 [transferred to *Purusha*]. — Metcalf 1956: 8 [catalogued].

Diagnosis

Male

Easily recognized by the following combination of characters: (1) tegmina with numerous small, round, black spots on membrane, more or less arranged in rows parallel to apical margin (Fig. 6A); (2) posterior wings brown with numerous small, black-brown spots on apical half (Fig. 6A–B); (3) ventral margin of gonostyli with internobasal process projecting posteriorly (Fig. 8B); (4) anterolateral spine of phallus much smaller than posterolateral one (Fig. 8F); (5) head, pro- and mesonotum brown, concolorous (Fig. 6C).

Female

Immediately recognized by the combination of the following characters: (1) tegmina with a conspicuous white waxy spot at half length, not touching the costal margin, and numerous minute, round, black spots on the membrane, arranged in 2–3 rows parallel to apical margin (Figs 5A, 7A); (2) posterior wings with numerous brown spots, sometimes merging together, more or less arranged in rows parallel to apical margin (Figs 5A, 7A); (3) head, pro- and mesonotum brown, concolorous (Figs 5C, 7C).

Differential diagnosis

Male

Easily separated from males of *P. pulverosa* and *P. vietnamica* sp. nov. (and probably *P. bellissima* sp. nov.) by the combination of characters (1) and (2) of diagnosis. From *P. reversa*, it is better separated based on characters (3)–(4) of diagnosis: (3) ventral margin of gonostyli without internobasal process projecting posteriorly in *P. reversa* (Fig. 17B); (4) anterolateral spine of phallus of equal size in *P. reversa* (Fig. 17G).

Etymology

The specific name is derived from the Latin adfjective '*paradoxa*', meaning 'paradoxical'.

Material examined

Holotype (Fig. 5)

INDONESIA • ♀; Java; "*Paradoxa*", "Zool. Mus. Greifswald, II 27390", "Typus *Messena paradoxa*"; ZIMG. In the original description, Gerstaecker (1895) stated that the specimen was collected by Hans Fruhstorfer (1866–1922) in the mountains of West Java.

Additional material

INDONESIA – **Java** • 1 ♀; "Tjibarangbang" [Cibaregbeg]; [6°50′ S, 106°39′ E]; 1939; Mrs M.E. Walsh leg.; ZML • 1 ♀; Sukabumi; [6°55′ S, 106°56′ E]; 1893; H. Fruhstorfer leg.; MMBC • 1 ♀; Sukabumi; [6°55′ S, 106°56′ E]; alt. 2000 ft; 8 Jan. 1940; J.M.A. van Groenendael leg.; RMNH • 1 ♀; Sukabumi, "Djampang Tengah" [Jampangtengah]; [7°03′ S, 106°48′ E]; alt. 18–2200 ft; 8 May 1939; J.M.A. van Groenendael leg.; RMNH • 1 ♀; "Soekaboemi" [Sukabumi]; [6°55′ S, 106°56′ E]; Ouwens leg.; ZMPA • 1 ♀; Staudinger leg.; NHRS. – **Sumatra** • 1 ♂, 1 ♀; Muller leg.; RMNH • 1 ♂; "Sum" [Sumatra], "Serapai Kor." [Korintji]; [1°41′ S, 101°15′ E]; 1915; Edw. Jacobson leg.; RMNH • 1 ♀; Sumatra, Excell. v. Studt G. leg.; MFNB.

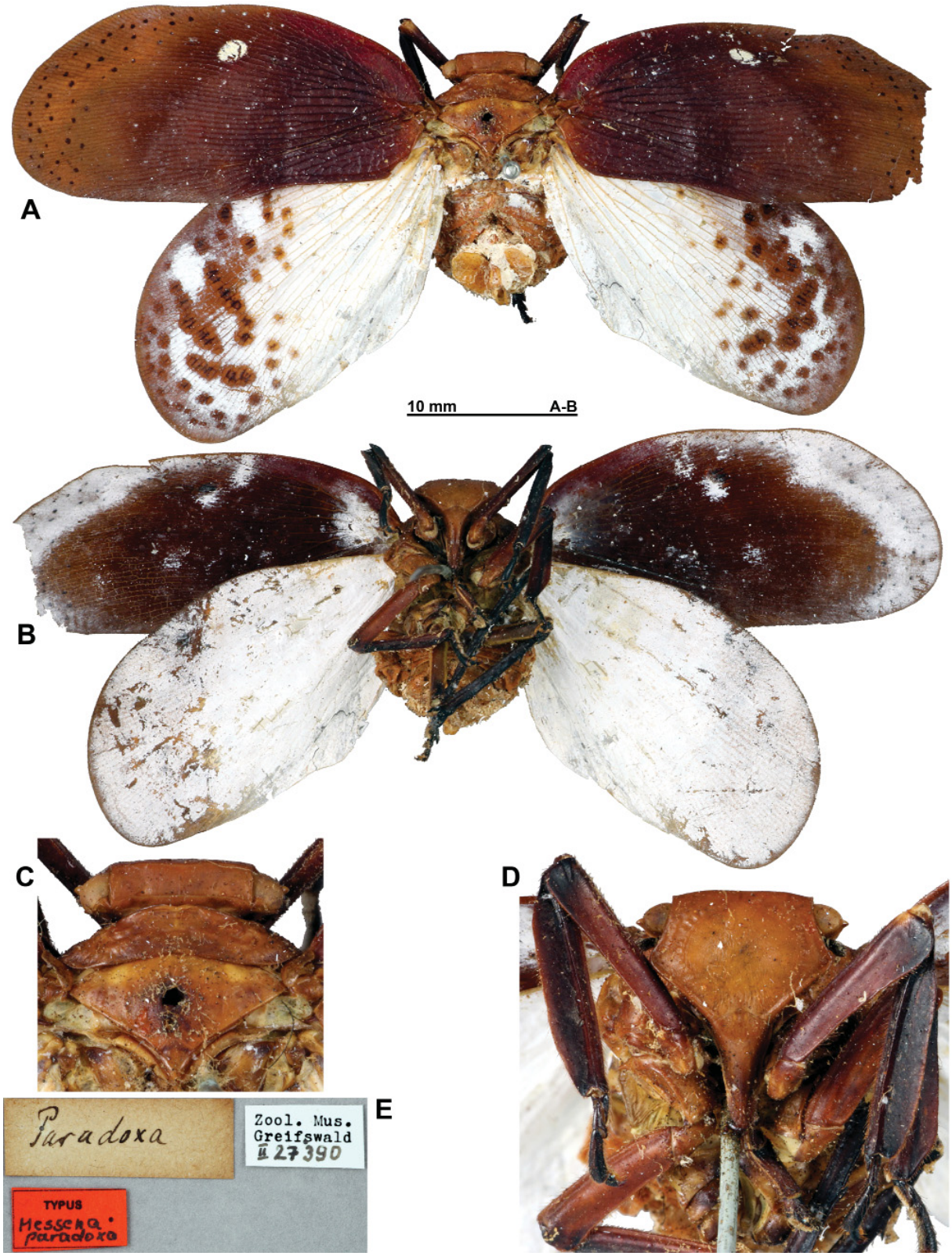

Fig. 5. *Purusha paradoxa* (Gerstaecker, 1895), holotype, ♀ (ZIMG). **A**. Habitus, dorsal view. **B**. Habitus, ventral view. **C**. Head and thorax, dorsal view. **D**. Normal view of frons. **E**. Labels. C–E not to scale.

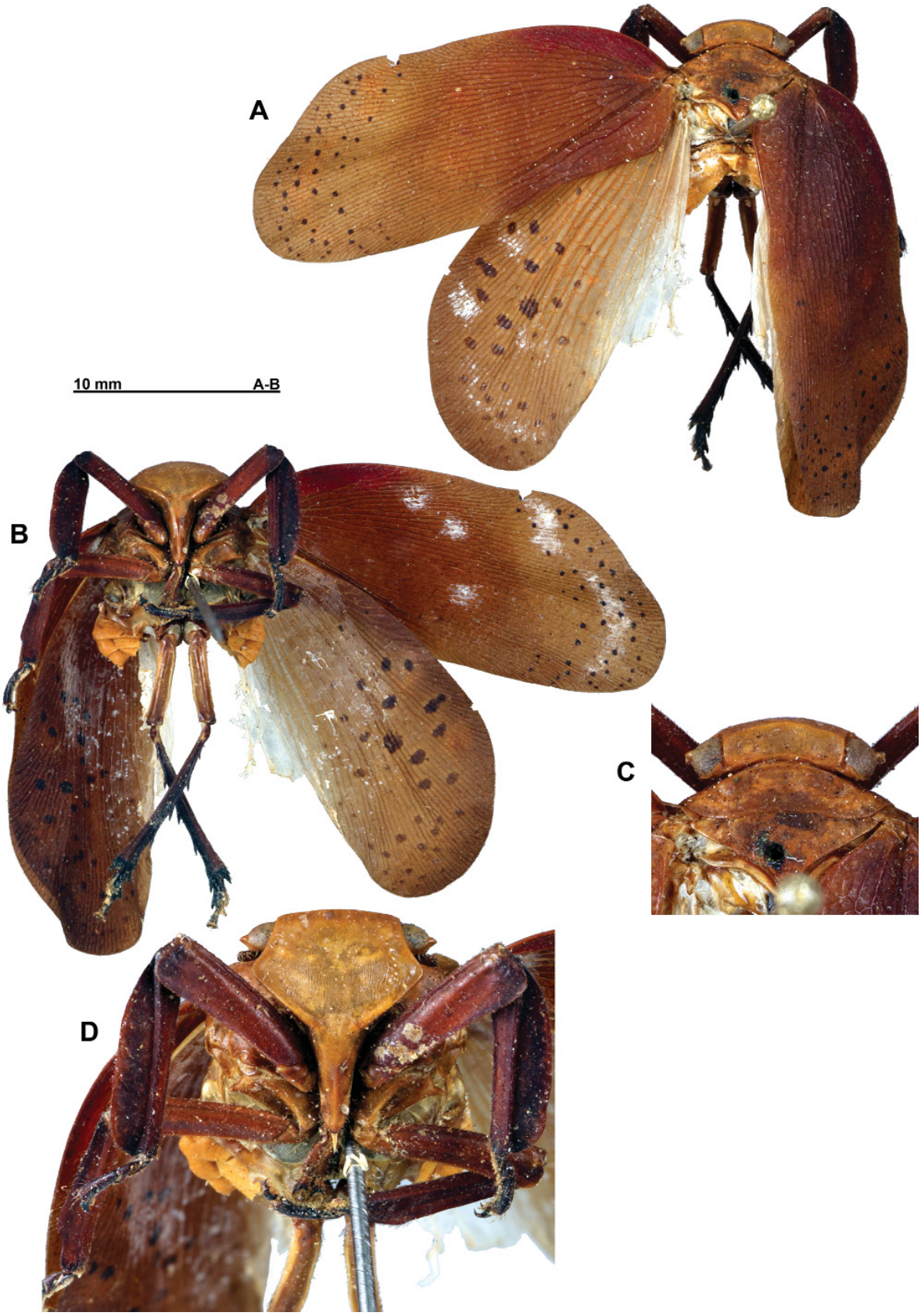

Fig. 6. *Purusha paradoxa* (Gerstaecker, 1895), ♂ from Sumatra (RMNH). **A**. Habitus, dorsal view. **B**. Habitus, ventral view. **C**. Head and thorax, dorsal view. **D**. Normal view of frons. C–D not to scale.

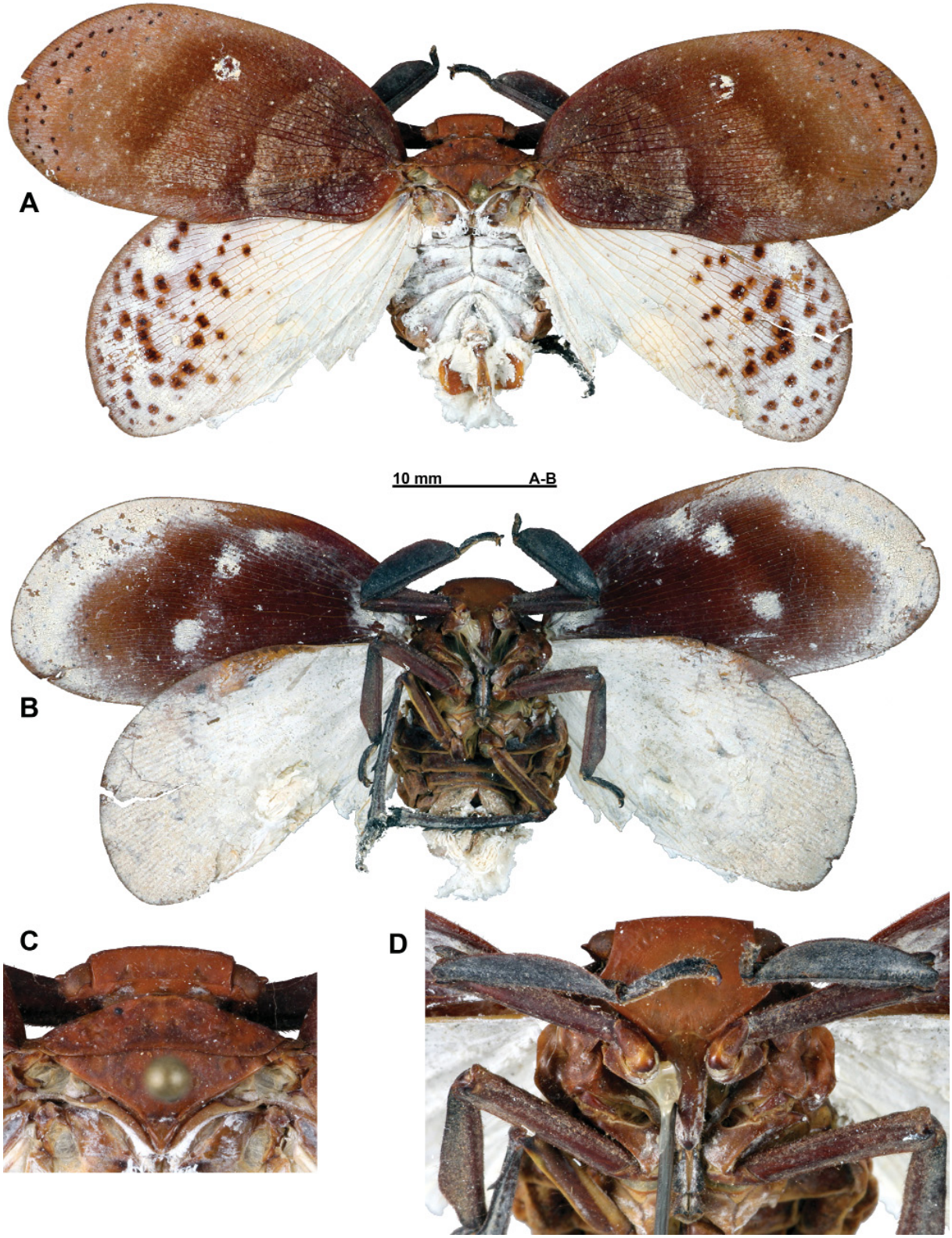

Fig. 7. *Purusha paradoxa* (Gerstaecker, 1895), ♀ from Java, Sukabumi (RMNH). **A**. Habitus, dorsal view. **B**. Habitus, ventral view. **C.** Head and thorax, dorsal view. **D**. Normal view of frons. C–D not to scale.

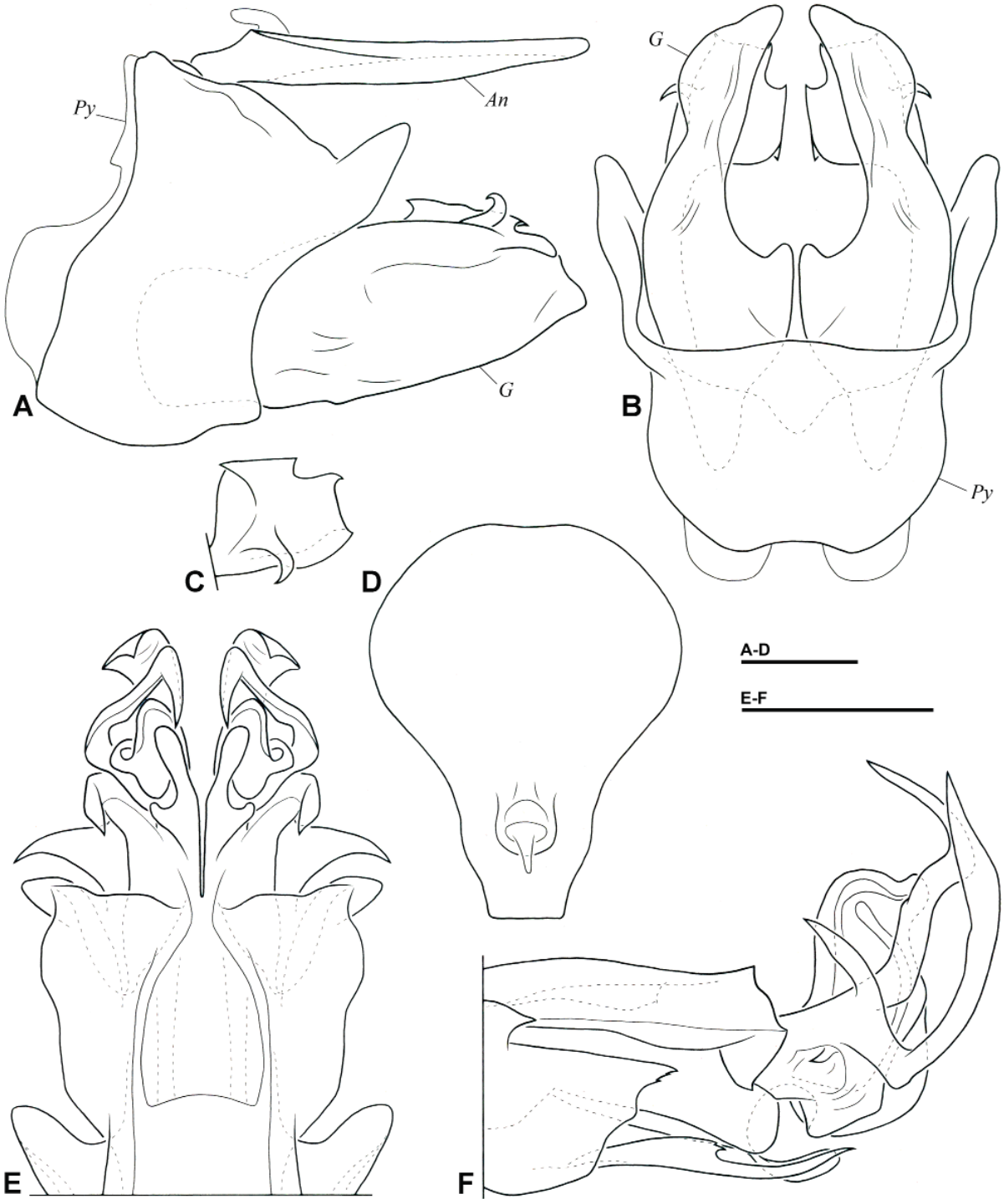

Fig. 8. *Purusha paradoxa* (Gerstaecker, 1895), male genitalia. **A**. Pygofer, anal tube and gonostylus, left lateral view. **B**. Pygofer and gonostyli, ventral view. **C**. Posterodorsal process of left gonostylus, dorsal view. **D**. Anal tube, dorsal view. **E**. Aedeagus, dorsal view. **F**. Aedeagus, left lateral view. Abbreviations: *An* = anal tube; *G* = gonostyli; *Py* = pygofer. Scale bar = 1 mm.

Measurements and ratios

♂: LT (n = 2): 23.8 mm (23.5–24.2); LTg/BTg = 2.3; BV/LV = 3.8; BF/LF = 1.6; LP+LM/BT = 0.68.
♀: LT (n = 5): 28.7 mm (27.3–31.4); LTg/BTg = 1.9–2.1; BV/LV = 4.3; BF/LF = 1.5; LP+LM/BT = 0.73.

Supplementary description

Male genitalia (Fig. 8)
Pygofer with lateral portion of posterior margin strongly projecting in a laminate process directed posterodorsally in lateral view and slightly laterally in ventral view; process narrowly rounded apically; ventral half of posterior margin excavate in lateral view; ventral portion of posterior margin bisinuate in ventral view; dorsal portion of pygofer strongly narrowing with posterior margin strongly excavate; anterior margin sinuate in lateral view (Fig. 8A–B). Anal tube large, broadly obovate, dorsoventrally flattened; apical margin slightly emarginate in dorsal view; lateral margin bisinuate, very broadly rounded on distal half; anal column at basal ¼ (Fig. 8A, D). Gonostyli subrectangular in lateral view, with short apicoventral process rounded apically; dorsal margin with laminate process projecting medially and armed with one tooth at medioanterior angle, two teeth on posterior margin and one strong hook laterally; ventral margin deeply emarginate on distal ⅔, with mediobasal process projecting posteriorly, leaving large central opening in ventral view (Fig. 8A–C). Phallobase robust, about as long as broad in dorsal view, with basolateral process directed posterolaterally and elongate, apical, spinose process ventrally on each side directed posterolaterally; slightly mediodorsally to spinose process, slightly shorter, apically blunt process directed posteriorly (Fig. 8E–F). Phallus with very complicated set of intricate processes: basal strong spine directed laterally; trispinose lateral process with basidorsal spine elongate and curved mediodorsally, posteroventral spine very elongate, sword shaped and curved dorsally and slightly anteriorly on distal portion, and apicodorsal spine incurving, sinuate, projecting mediodorsally and slightly anteriorly on distal portion; mediodorsally, pair of laterally compressed processes higher than long in lateral view and with lateral ridged process (Fig. 8E–F).

Distribution

Indonesia in the islands of Java and Sumatra (Fig. 4).

Biology

Unknown. The species has not been collected or documented in any way since 1940.

Purusha pulverosa Distant, 1918
Figs 4, 9–12

Purusha pulverosa Distant, 1918: 198 [listed], 200 [described].

Purusha pulverosa – Metcalf 1956: 8 [catalogued].

Diagnosis

Male
Easily recognized by the following combination of characters: (1) tegmina with small brown lines arranged in concentric rows parallel to apical margin on membrane, more visible in ventral view if the tegmina are covered with white wax (Fig. 11A–B); (2) posterior wings whitish, without markings (Fig. 11A–B); (3) anterior half of pronotum yellowish (Fig. 11C).

Female
Immediately recognized by the combination of the following characters: (1) tegmina without conspicuous white waxy spot but most often strongly covered with white wax, and very faint brown small lines on the

membrane, arranged in 2–3 rows parallel to apical margin, mostly visible on ventral side; (2) posterior wings without spots; (3) anterior half of pronotum yellowish.

Differential diagnosis

Male

Easily separated from males of *P. paradoxa*, *P. reversa* and *P. vietnamica* sp. nov. by the characters given in diagnosis; from *P. bellissima* sp. nov., it will very probably be separated by posterior wings missing concentric rows of brown lines parallel to costal margin.

Etymology

The specific name is derived from the Latin adjective '*pulverosa*', meaning 'dusty', and referring to the white waxy secretion covering the body and wings in this species.

Material examined

Holotype (Fig. 10)

VIETNAM • ♀; [Tonkin, June 1917. R.V. de Salvaza] [1918–1] [*Purusha pulverosa* Dist., Type] [Type]; BMNH.

Additional material

LAOS • 1 ♀; "Tintoe"; 1 Dec. 1918; R.V. de Salvaza leg.; BMNH.

THAILAND • 1 ♀; Loei Province, Phu Rua National Park; 17°30′ N, 101°21′ E; 6–9 May 1999; alt. 1100 m; D. Hauck leg.; MMBC • 1 ♂; Chiang Rai Province, Wiang Pa Pao district; [19°20′54″ N, 99°30′24″ E]; Aug. 1989; MHNL.

Examined from photograph (Fig. 9)

THAILAND • 1 specimen; Chiang Mai; 18°47′43″ N, 98°59′55″ E; 2 May 2009; John Moore photogr. • 1 ♀; Chiang Mai; 18°47′43″ N, 98°59′55″ E; 20 Nov. 2018; Itsrapong Voraphab leg.; DNPT.

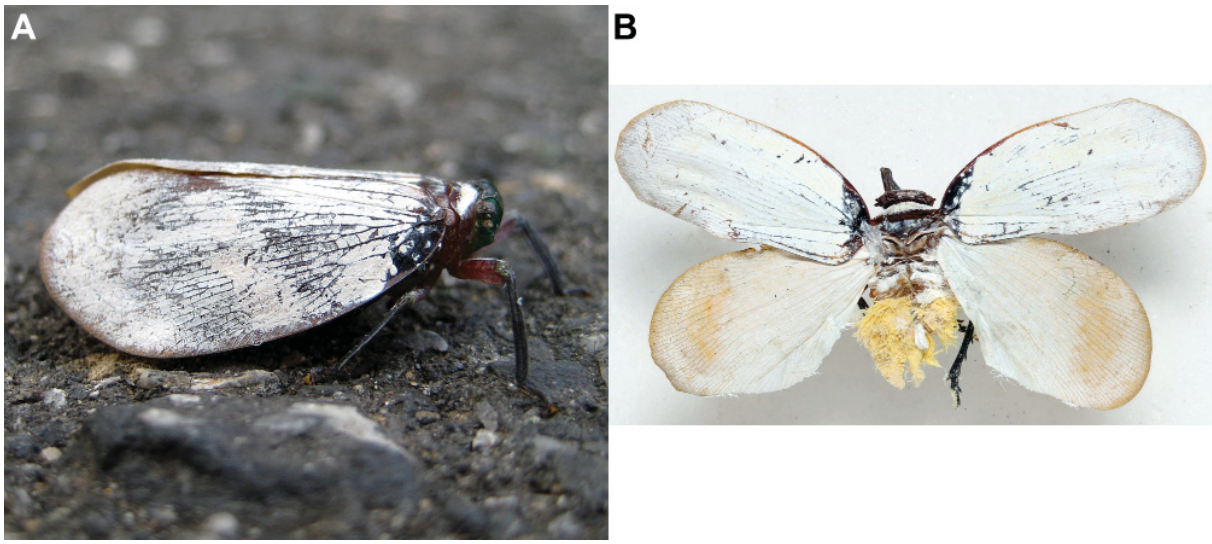

Fig. 9. *Purusha pulverosa* Distant, 1918. **A**. Specimen in nature, Thailand, Chiang Mai, 2 May 2009 (photograph by J. Moore). **B**. ♀, Thailand, Chiang Mai, 20 Nov. 2018, I. Voraphab (DNPT – photograph by K. Jiaranaisakul).

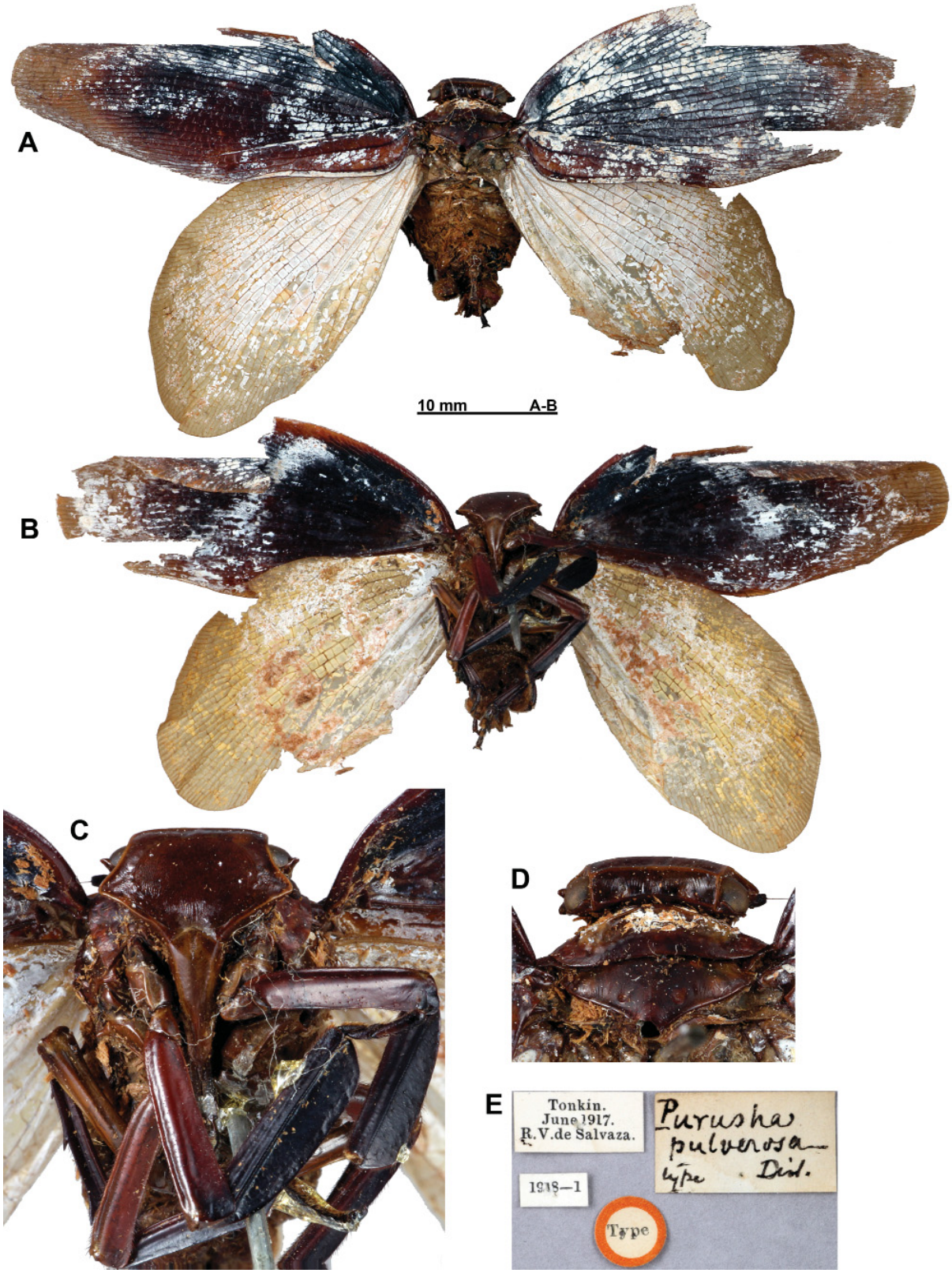

Fig. 10. *Purusha pulverosa* Distant, 1918, holotype, ♀ (BMNH). **A**. Habitus, dorsal view. **B**. Habitus, ventral view. **C**. normal view of frons. **D**. Head and thorax, dorsal view. **E**. Labels. C–E not to scale.

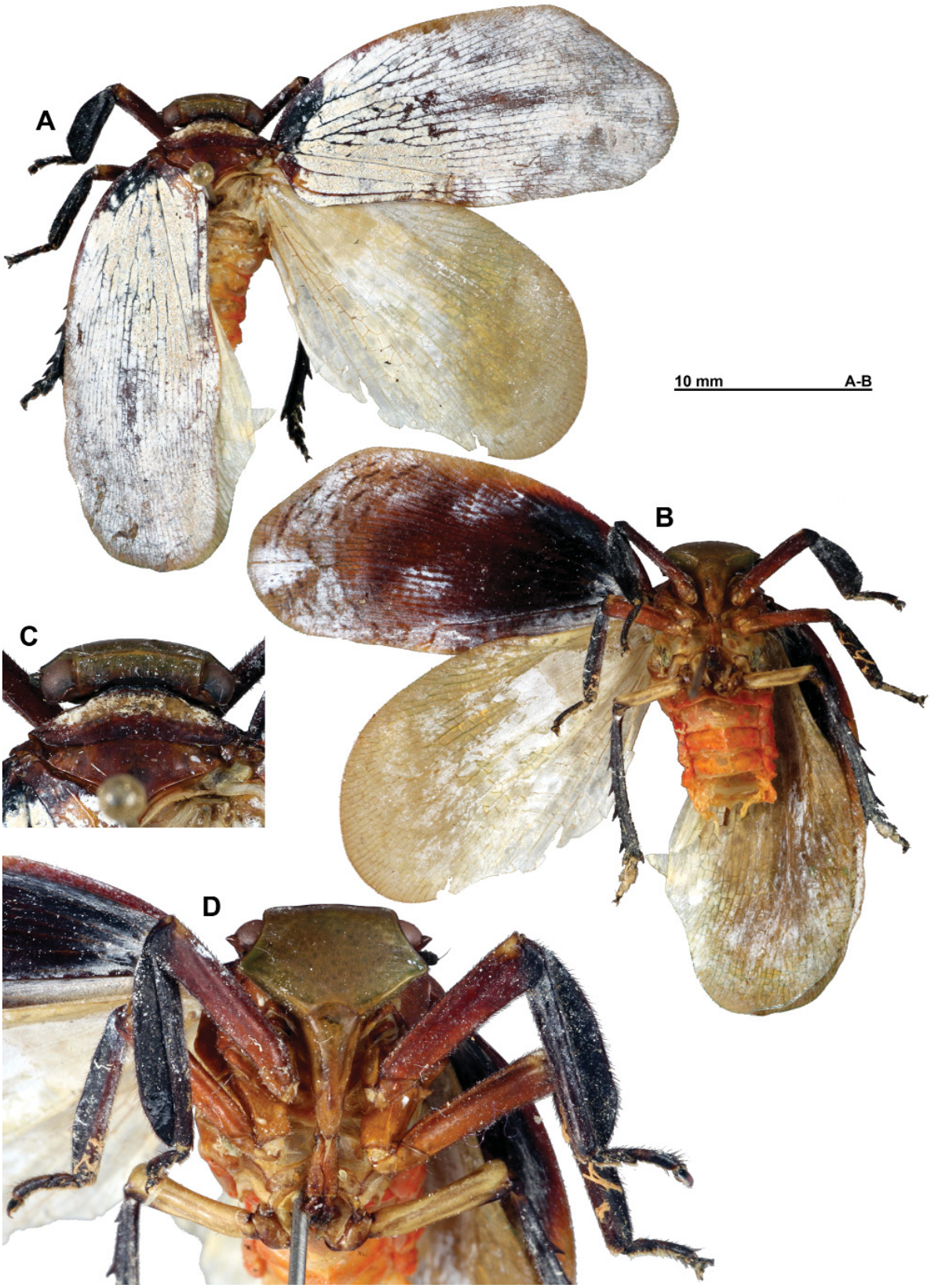

Fig. 11. *Purusha pulverosa* Distant, 1918, ♂ from Wiang Pa Pao, Thailand (MHNL). **A**. Habitus, dorsal view. **B**. Habitus, ventral view. **C**. Head and thorax, dorsal view. **D**. Normal view of frons. C–D not to scale.

Note

The location "Tintoe" in Laos was not found and is not recorded on Vitalis de Salvaza's (1919) entomological map. However, as Vitalis de Salvaza collected at Pak Noun on the Mekong River in today's Sayaboury Province in Nov. 1918 and at Ban Hou (Louangprabang Prov.) in Oct. 1918, it is

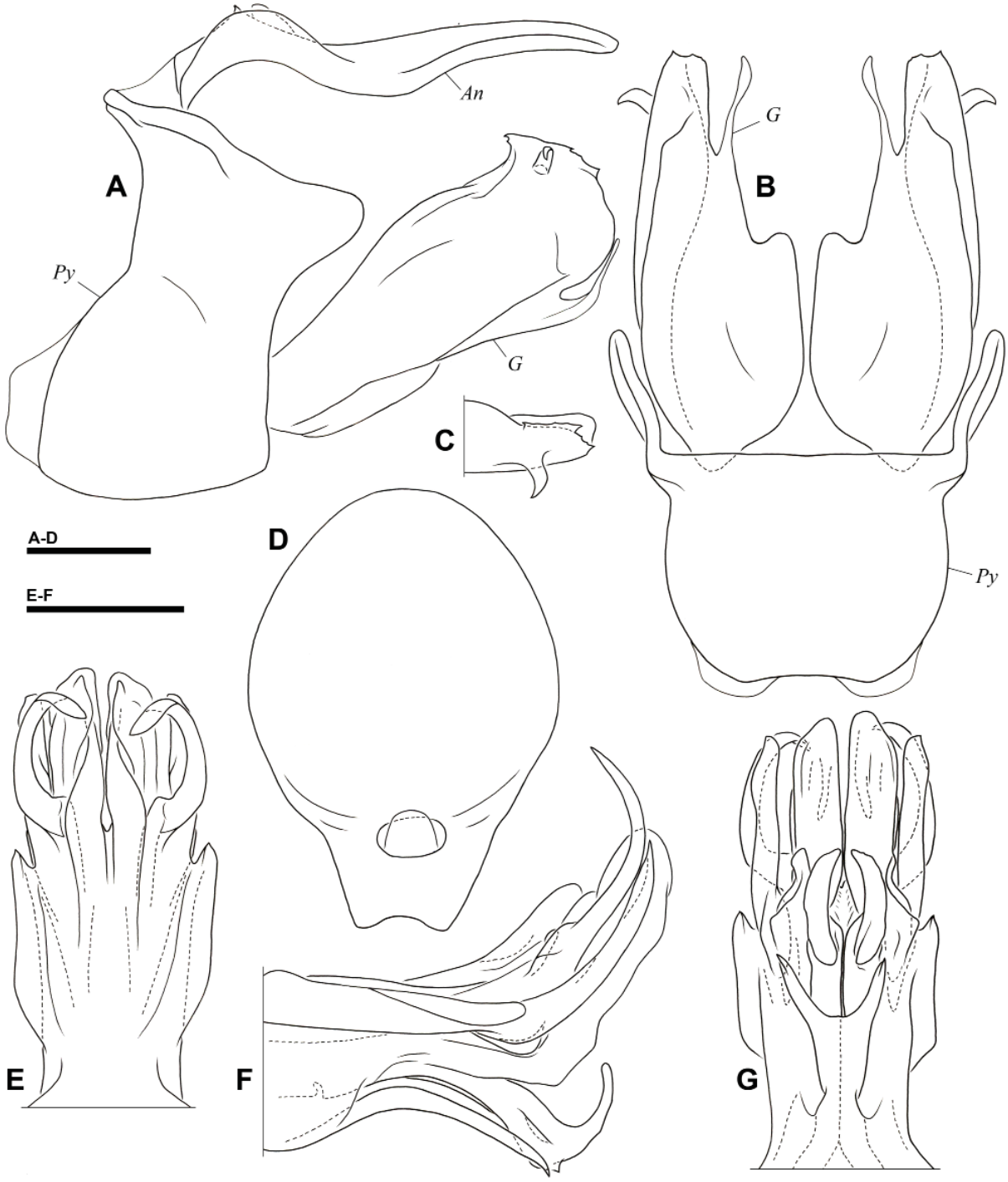

Fig. 12. *Purusha pulverosa* Distant, 1918, male genitalia. **A**. Pygofer, anal tube and gonostylus, left lateral view. **B**. Pygofer and gonostyli, ventral view. **C**. Posterodorsal process of left gonostylus, dorsal view. **D**. Anal tube, dorsal view. **E**. Aedeagus, dorsal view. **F**. Aedeagus, left lateral view. **G**. Aedeagus, ventral view. Scale bars = 1 mm. Abbreviations: *An*: anal tube; *G*: gonostyli; *Py*: pygofer.

likely that the locations he sampled in Dec. 1918 are situated in the same part of the Mekong Valley (M. Geiser pers. com., 2019).

Measurements and ratios

♂: LT (n = 1): 24.1 mm; Ltg/BTg = 2.0; BV/LV = 4.5; BF/LF = 1.85; LP+LM/BT = 0.6.
♀: LT (n = 2): 31.8 mm (31.0–32.6) ; LTg/BTg = 2.0; BV/LV = 4.4; BF/LF = 1.93; LP+LM/BT = 0.6.

Supplementary description

Male genitalia (Fig. 12)

Pygofer with dorsal half of lateral portion of posterior margin strongly projecting in laminate process directed posteriorly in lateral view and slightly laterally in ventral view; process narrowly rounded apically; ventral half of posterior margin slightly excavate in lateral view; ventral portion of posterior margin straight in ventral view; dorsal portion of pygofer strongly narrowing with posterior margin strongly excavate; anterior margin sinuate in lateral view (Fig. 12A–B). Anal tube large, broadly obovate, dorsoventrally flattened; apical margin broadly rounded in dorsal view; lateral margin very broadly rounded on distal half, narrowing basally in dorsal view, bisinuate in lateral view, more strongly so near base; anal column at basal ¼ (Fig. 12A, D). Gonostyli elongate, slightly broadening towards apex in lateral view, with ribbon-like apicoventral process directed posteriorly; dorsal margin forming an incurved denticulate lamina at posterodorsal angle; lateral hook near posterodorsal angle; ventral margin strongly emarginate on distal half in ventral view, forming a broad opening, small rounded process directed posteriorly at base of emargination (Fig. 12A–C). Phallobase robust, longer than broad in dorsal view, with horizontal lateral carina ended in a short posterior process directed posteriorly; ventrally, elongate, deeply furcate process curved ventrally, apices of furca pointed; dorsally to furcate process, pair of strong processes surpassing furcate process, curved ventrally on basal ⅔ and ending with blunt hook strongly curved dorsally (Fig. 12E–G). Phallus with two elongate, slightly sword-shaped, incurved processes, ventral one shorter than dorsal one in lateral view; dorsal process more strongly curved medioanterodorsally than ventral one; mediodorsally, pair of large elongate processes with slightly excavate portion dorsally before apex (Fig. 12E–G).

Distribution

Northern Vietnam, Laos and northern Thailand (Fig. 4).

Biology

Unknown.

Purusha reversa (Hope, 1843)
Figs 1E, 4, 13–18

Eurybrachis (sic!) *reversa* Hope, 1843: 134 [described], pl. xii fig. 8 [habitus illustrated].
Purusha rubromaculata Distant, 1906b: 204 [described], syn. nov.

Eurybrachys reversa – Schaum 1850: 71 [listed in the genus *Eurybrachys*]. — Walker 1851: 382 [listed]. — Atkinson 1886: 22 [redescribed as "species of uncertain position"].
Messena reversa – Gerstaecker 1895: 33 [allied to *Purusha paradoxa* (Gerstaecker, 1895)], 34 [transferred to *Messena*].
Purusha reversa – Distant 1906a: 236 [described, scarce species], fig. 102 [habitus illustrated (illustration from Hope 1843)]; 1906b: 203 [type species of *Purusha*], 204 [catalogued]. — Metcalf 1956: 8 [catalogued].
Purusha rubromaculata – Metcalf 1956: 9 [catalogued].

Diagnosis

Male

Easily recognized by the following combination of characters: (1) tegmina with numerous small, round, black spots on membrane, more or less arranged in rows parallel to apical margin (Fig. 15A–B); (2) posterior wings brown with numerous small, black-brown spots on apical half (Fig. 15A–B); (3) head, pro- and mesonotum brown, concolorous (Fig. 15C); (4) ventral margin of gonostyli without internobasal process projecting posteriorly (Fig. 17B); (5) anterolateral and posterolateral spines of phallus about the same size (Fig. 17G).

Female

Immediately recognized by the combination of the following characters: (1) tegmina with conspicuous white waxy spot at basal third, along costal margin, but without minute black spots or brown lines on membrane (Figs 13A, 14A, 16A); (2) posterior wings with numerous brown spots, sometimes merging together, more or less arranged in rows parallel to apical margin (Figs 13A, 14A, 16A); (3) head, pro- and mesonotum brown, concolorous (Figs 13C, 14E, 16B).

Differential diagnosis

Male

Easily separated from males of *P. pulverosa* and *P. vietnamica* sp. nov. (and probably *P. bellissima* sp. nov.) by combination of characters: (1)–(3) of diagnosis; from *P. paradoxa*, it is better separated based on characters (4)–(5) of diagnosis: (4) ventral margin of gonostyli with internobasal process projecting posteriorly in *P. paradoxa* (Fig. 8B); (2) anterolateral spine of phallus smaller than posterolateral one in *P. paradoxa* (Fig. 8F).

Etymology

The specific names are derived from the Latin adjectives '*reversa*', meaning 'inverted', and '*rubromaculata*', juxtaposition of '*ruber*', meaning 'red', and '*maculatus*', meaning 'spotted', and referring to the reddish spots on the tegmina.

Material examined

Holotype of *Eurybrachys reversa* (Fig. 13)

BANGLADESH • ♀; [Sylhet]; [24°54′ N, 91°52′ E]; "*Eurybrachis reversa* Hope, Type"; "Type, Hope, Trans. Linn. Soc. XIX. p. 134, T. 12 f.8, Coll. Hope Oxon."; "Type Hem: 477, *Eurybrachis reversa* Hope, Hope Dept. Oxford"; OUMNH.

Holotype of *Purusha rubromaculata* (Fig. 14)

THAILAND • ♀; [Chanthaburi]; [12°36′31″ N, 102°06′14″ E]; Mouhot leg.; "*Purusha rubromaculata* Dist. Type"; "Chant. Mouhot"; "68 4"; "Type"; BMNH.

The type locality for *Eurybrachys reversa* given by Hope (1843) is "Silhet" (= Sylhet in Bangladesh) and the one given for *P. rubromaculata* given by Distant (1906b), corresponding to "Chant." on the label, is Chantabun (= Chanthaburi, Thailand).

Additional material

MALAYSIA • 1 ♀; Cameron Highlands; [4°30′ N, 101°30′ E]; May 2005; I.G.: 34.051; RBINS • 1 ♀; Cameron Highlands; [4°30′ N, 101°30′ E]; Mar. 2017; I.G.: 33.636; RBINS • 1 ♀; Perak, Maxewell Hill [Bukit Larut]; [4°51′44.28″ N, 100°47′34.8″ E]; alt. 3000 ft; Jun.–Jul. 1916; ex F.M.S. Museum, B.M. 1955-354; BMNH.

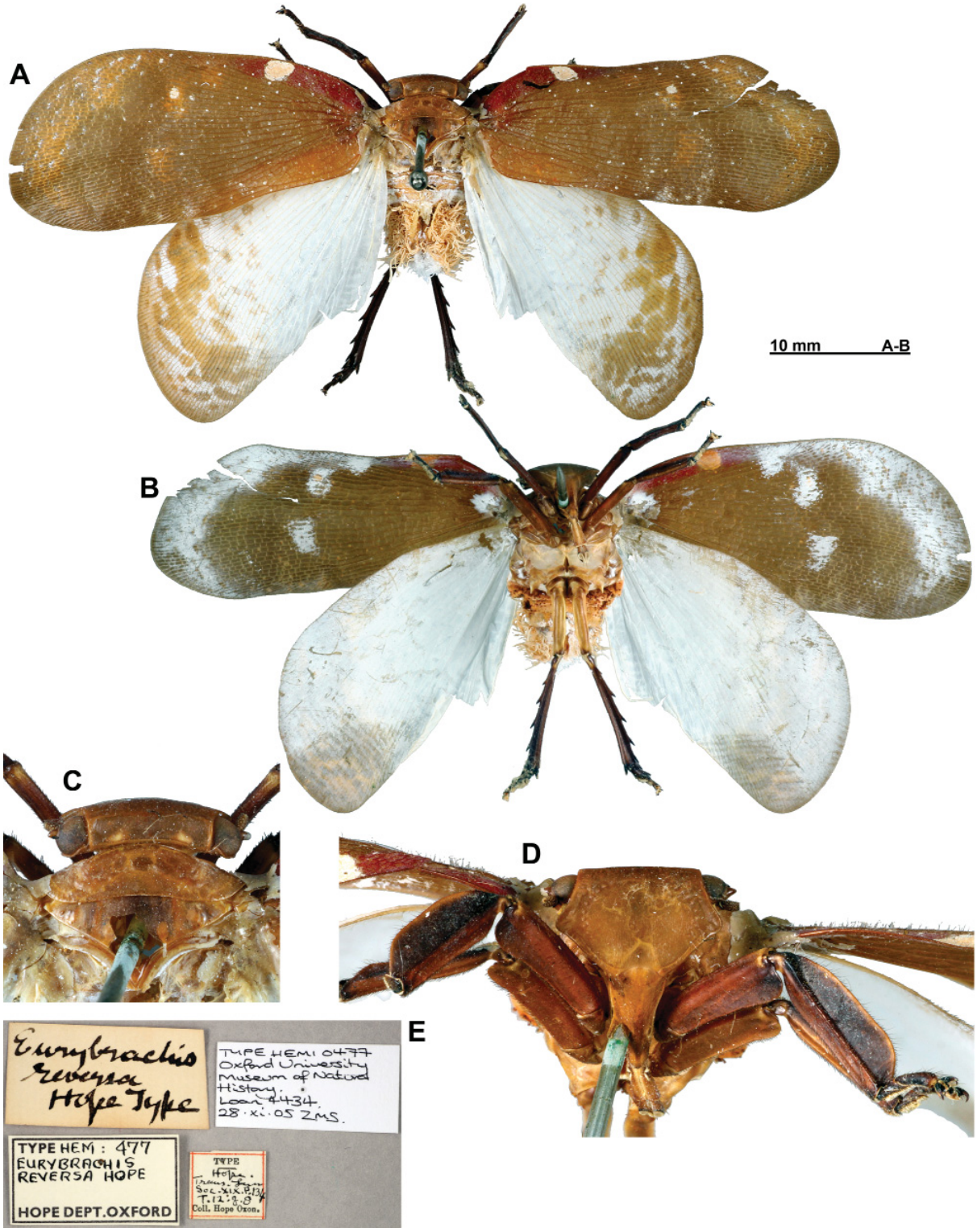

Fig. 13. *Purusha reversa* (Hope, 1843), holotype, ♀ (OUMNH). **A**. Habitus, dorsal view. **B**. Habitus, ventral view. **C**. Head and thorax, dorsal view. **D**. Normal view of frons. **E**. Labels. C–E not to scale.

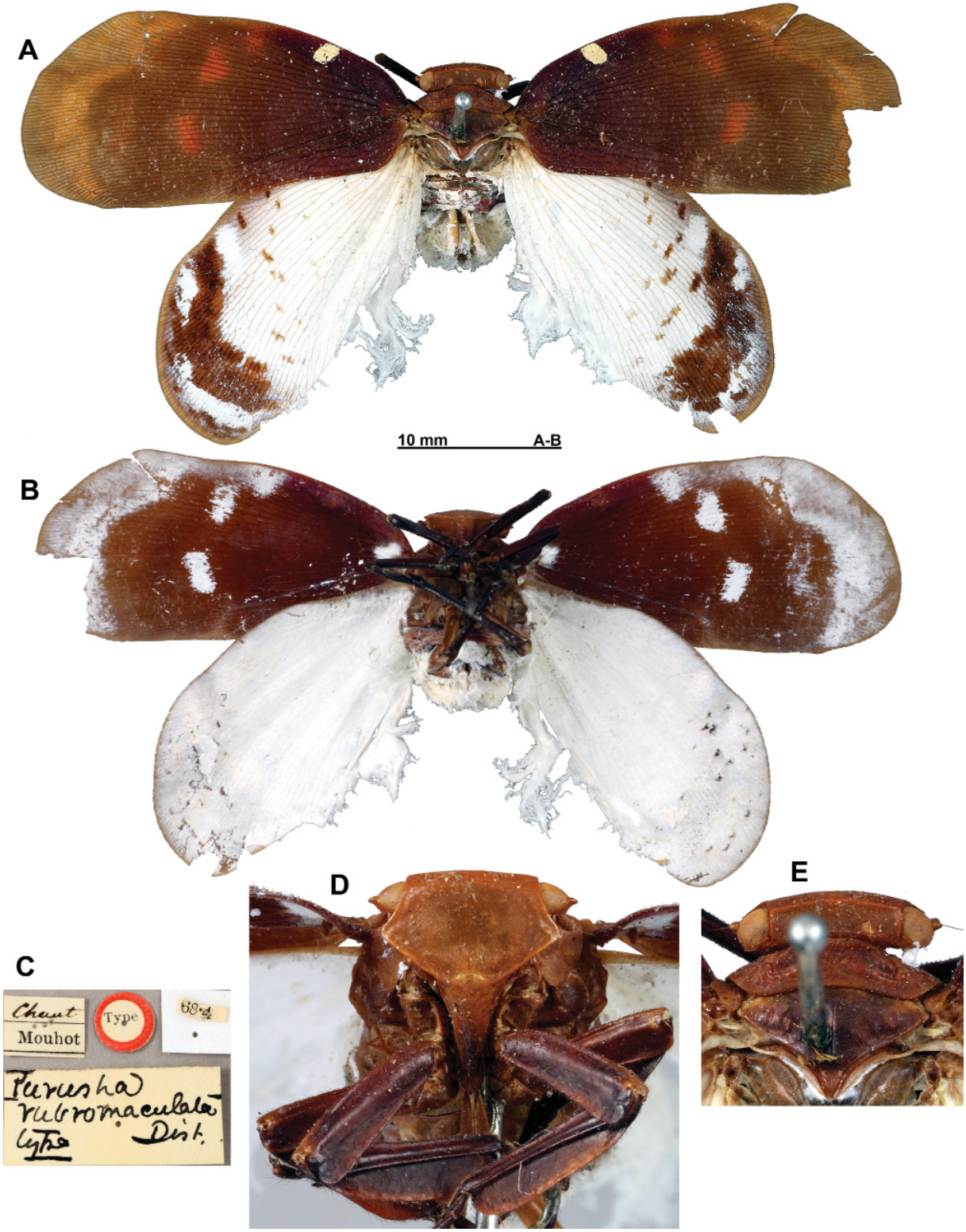

Fig. 14. *Purusha rubromaculata* Distant, 1906, holotype, ♀ (BMNH). **A**. Habitus, dorsal view. **B**. Habitus, ventral view. **C**. Labels. **D**. Normal view of frons. **E**. Head and thorax, dorsal view. C–E not to scale.

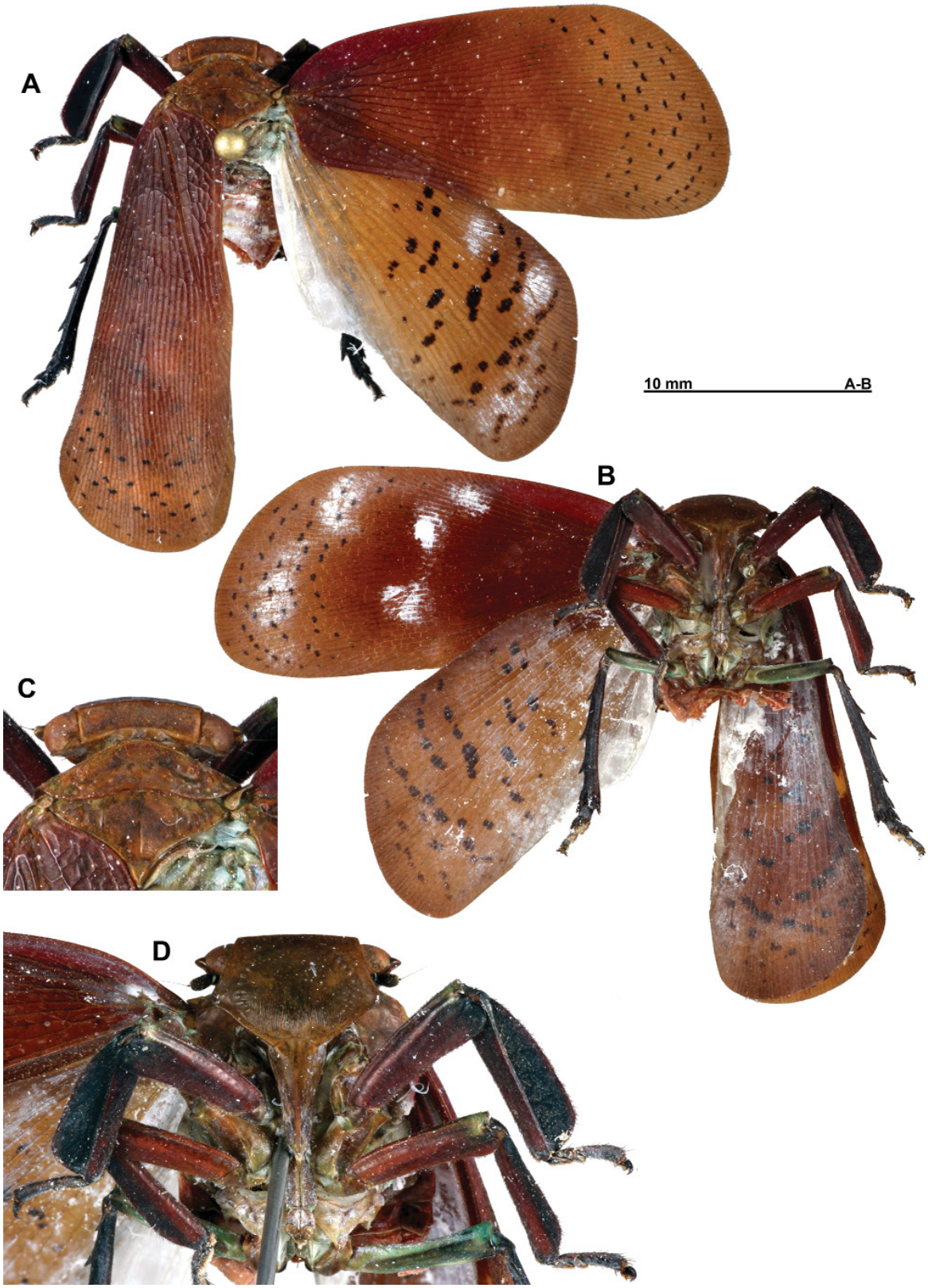

Fig. 15. *Purusha reversa* (Hope, 1843), ♂ from Thailand, Betong (RBINS). **A**. Habitus, dorsal view. **B**. Habitus, ventral view normal view of frons. **C**. Head and thorax, dorsal view. **D**. normal view of frons. C–D not to scale.

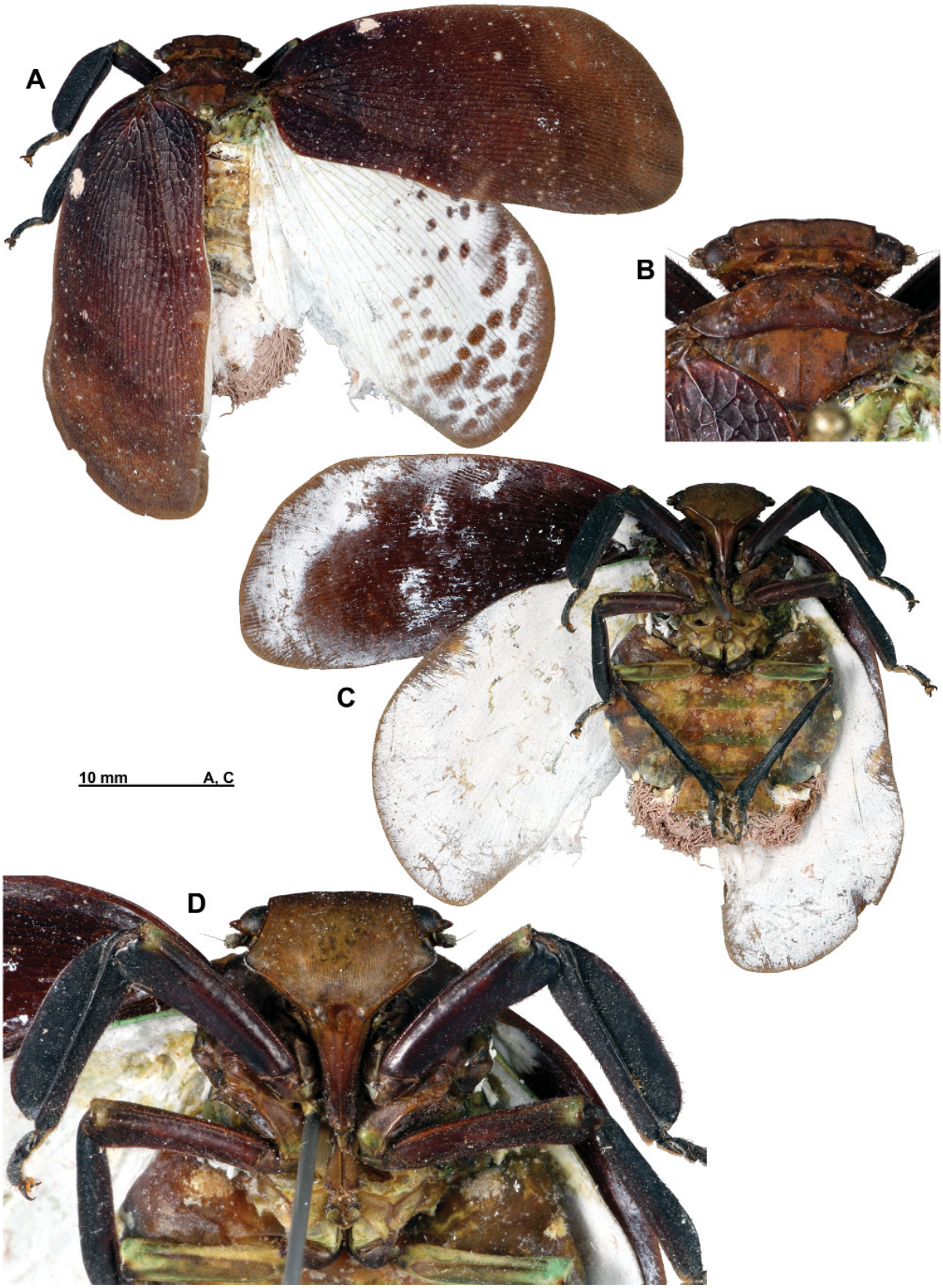

Fig. 16. *Purusha reversa* (Hope, 1843), ♀ from Malaysia, Cameron Highlands (RBINS). **A**. Habitus, dorsal view. **B**. Habitus, ventral view normal view of frons. **C**. Head and thorax, dorsal view. **D**. Normal view of frons. B and D not to scale.

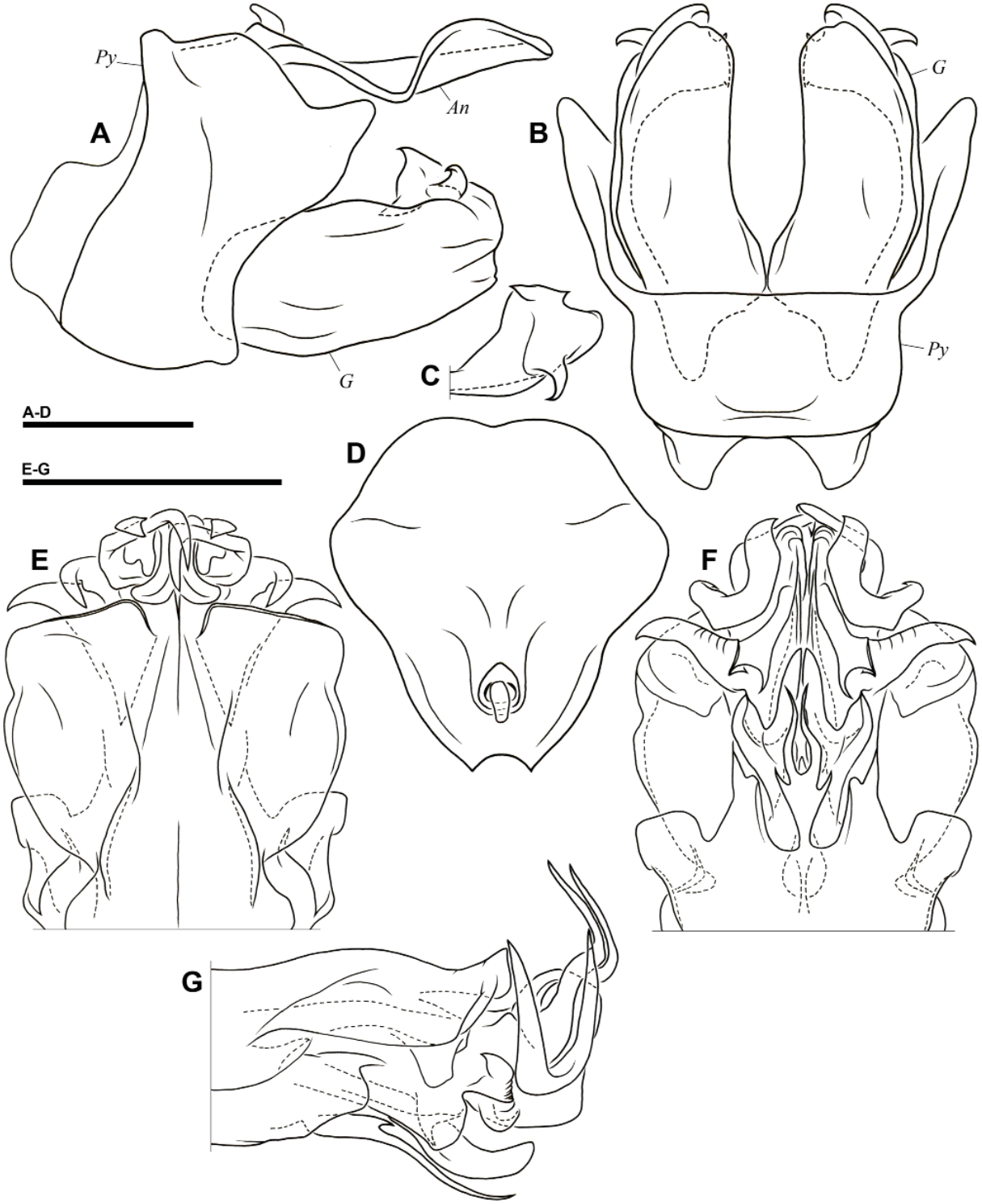

Fig. 17. *Purusha reversa* (Hope, 1843), male genitalia (RBINS). **A**. Pygofer, anal tube and gonostylus, left lateral view. **B**. Pygofer and gonostyli, ventral view. **C**. Posterodorsal process of left gonostylus, dorsal view. **D**. Anal tube, dorsal view. **E**. Aedeagus, dorsal view. **F**. Aedeagus, ventral view. **G**. Aedeagus, left lateral view. Abbreviations: *An* = anal tube; *G* = gonostyli; *Py* = pygofer. Scale bars = 1 mm.

THAILAND • 1 ♂; Yala Province, Betong; [5°47′04″ N, 101°02′22″ E]; 27 Jun. 2015; Les Day leg.; I.G.: 34.051; RBINS • 1 ♀; "Siamese Malay States, B. B." [Bukit Besar]; alt. 2500 ft; Annandale and Robinson leg.; "1903–127"; according to Brunetti (1923) and Woodley (2012), "B. B." would actually be situated in Pattani Province; code N° 293; BMNH.

Examined from photographs (Fig. 18C–D)
THAILAND • 1 ♀; Yala Province, Betong; [5°47′04″ N, 101°02′22″ E]; 17 Dec. 2014; S. Atdhabhan photogr.

Description

Measurements and ratios

♂: LT (n = 1): 22.6 mm; LTg/BTg = 2.1; BV/LV = 4.15; BF/LF = 1.65; LP+LM/BT = 0.7.
♀: LT (n = 4): 29.4 mm (26.6–31.5); LTg/BTg = 2.1; BV/LV = 4.4; BF/LF = 1.66; LP+LM/BT = 0.7.

Male genitalia (Fig. 17)

Pygofer with lateral portion of posterior margin strongly projecting in subtriangular laminate process directed posteriorly in lateral view and slightly laterally in ventral view; process narrowly rounded apically; ventral half of posterior margin excavate in lateral view; ventral portion of posterior margin straight in ventral view; dorsal portion of pygofer abruptly narrowing with posterior margin strongly excavate; anterior margin sinuate in lateral view (Fig. 17A–B). Anal tube large, broadly obovate, widest at about mid-length, dorsoventrally flattened; apical margin slightly emarginate in dorsal view; lateral margin bisinuate, very broadly rounded on distal ⅓ in dorsal view; lateral margin strongly undulate in lateral view; anal column at basal ¼ (Fig. 17A, D). Gonostyli subrectangular in lateral view, with prominent apicodorsal process; apicodorsal process laminate, projecting medially and armed with one tooth at medioanterior angle, one tooth at medioposterior angle and one strong hook laterally, curved anteroventrally on apical portion; ventral margin emarginate on distal ⅘, leaving large, parallel-sided central opening in ventral view (Fig. 17A–C). Phallobase robust, about as long as broad in dorsal view, with rather short, blunt basolateral process directed posterolaterally and elongate, apical, bifurcate process ventrally, sinuate in lateral view and directed postroventrally; dorsally to bifurcate process, slightly longer, apically blunt process directed posteriorly (Fig. 17E–G). Phallus with very complicated set of intricate processes: basal strong spine directed laterally; trispinose lateral process with basidorsal spine elongate and directed dorsally, posteroventral spine elongate, about as long as basidorsal one, directed dorsally and slightly curved anteriorly on distal portion, and apicodorsal spine incurving, sinuate, projecting mediodorsally and slightly anteriorly on distal portion; mediodorsally, pair of laterally compressed processes about as high as long in lateral view and with lateral ridged process (Fig. 17E–G).

Distribution

Bangladesh, Thailand and Peninsular Malaysia (Fig. 4).

Biology

The species was observed sitting on leaves of plants and shrubs in southern Thailand (L. Day pers. com., 2015). When disturbed, the specimen showed a specific behaviour, lifting the wings at perpendicular angle (Fig. 18D).

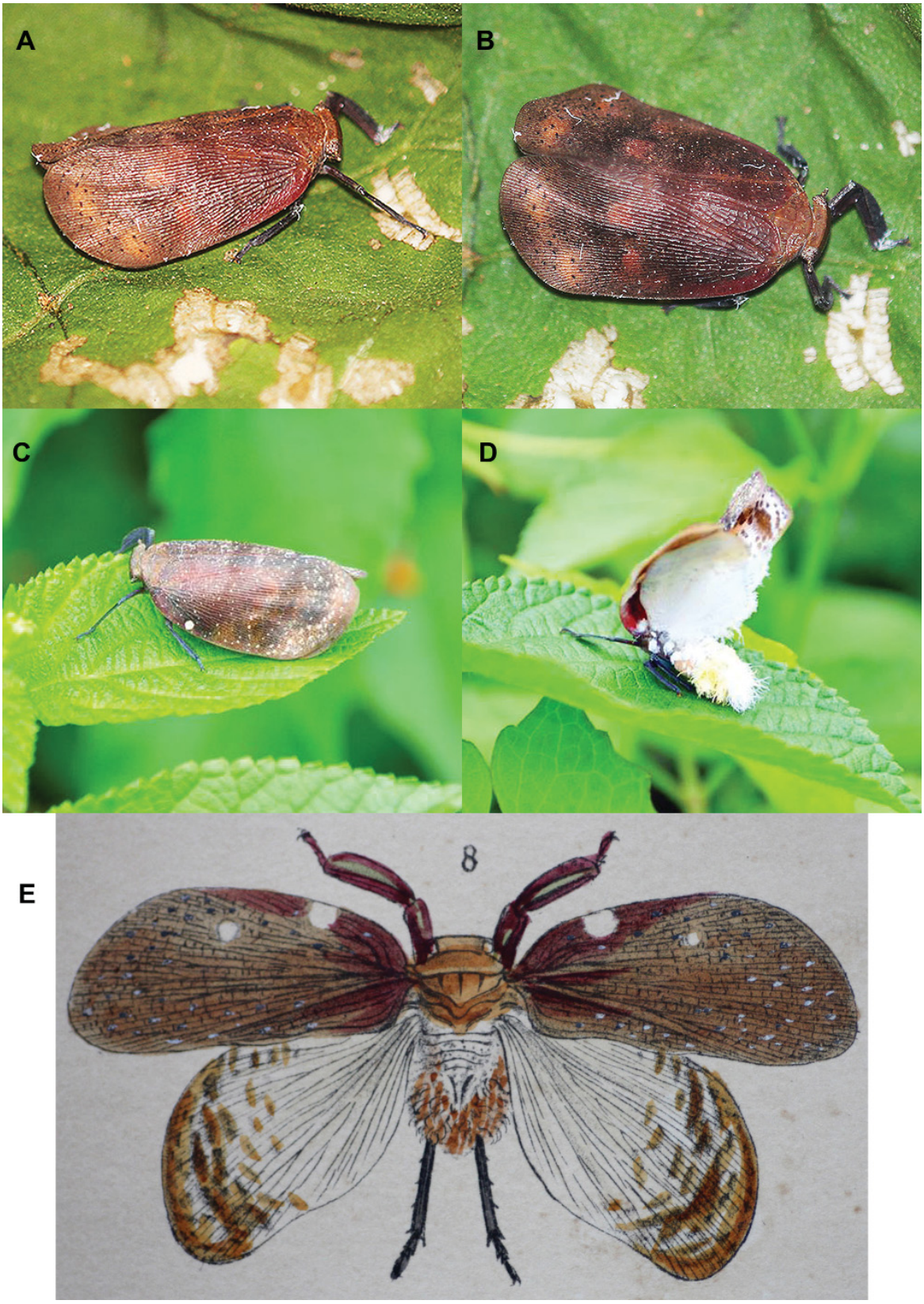

Fig. 18. *Purusha reversa* (Hope, 1843). **A–B**. ♂ in nature, Thailand, Betong, 27 Jun. 2015 (photographs by L. Day). **C–D**. ♀ in nature, Thailand, Betong, 7 Dec. 2014 (photographs by S. Atdhabhan). **D**. Defensive posture with wings raised. **E**. Illustration in the original description.

Purusha vietnamica sp. nov.
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Figs 4, 19–21

Diagnosis

Male

Easily separated from the males of *P. paradoxa*, *P. pulverosa* and *P. reversa* by the following combination of characters: (1) tegmina with concentric rows of narrow brown stripes on membrane, parallel to apical margin (Fig. 19A–B); (2) posterior wings pale brownish white with concentric rows of narrow brown stripes parallel to apical margin (Fig. 19A–B); (3) head, pro- and mesonotum brown, concolorous (Fig. 19C).

Female

Immediately recognized by the combination of the following characters: (1) tegmina with concentric rows of narrow brown stripes on membrane, parallel to apical margin but without basal band of white wax and oval white waxy spot along costal margin; (2) posterior wings pale brownish white with concentric rows of narrow brown stripes parallel to apical margin; (3) head, pro- and mesonotum brown, concolorous.

Differential diagnosis

Male

Easily separated from the males of *P. paradoxa*, *P. pulverosa* and *P. reversa* by the combination of characters (1)–(3) of diagnosis; it should be separated from *P. bellissima* sp. nov. by the examination of the aedeagus.

Etymology

The species epithet refers to the country from which the species originates, Vietnam.

Material examined

Holotype (Fig. 19)

VIETNAM • ♂; Tonkin, Cho-Ganh; [20°10′ N, 105°57′ E]; L. Duport leg.; I.G.: 17.865; "Coll. R.I.Sc.N.B., Nord Vietnam, Tonkin, Cho-Ganh, L. Duport"; "R.I.Sc.N.B. I.G. 17.865"; RBINS.

Paratype (Fig. 20)

VIETNAM • ♀; Tonkin; Jun. 1917; R.V. de Salvaza leg.; "Tonkin, June 1917, R.V. de Salvaza"; "Pusa Coll. 1915–164"; BMNH.

Measurements and ratios

♂: LT (n = 1): 23.4 mm; LTg/BTg = 2.1; BV/LV = 4.5; BF/LF = 1.66; LP+LM/BT = 0.6.
♀: LT (extrapolated; n = 1): 28.1 mm; LTg/BTg = 2.1; BV/LV = 4.4; BF/LF = 1.68; LP+LM/BT = 0.6.

Description

Male (Fig. 19)

Head (Fig. 19C, E). Dark reddish brown, slightly narrower than thorax. Vertex strongly transverse, concave and with anterior margin slightly curved in dorsal view. Frons broader than long, slightly convex and with lateral angles produced laterally. Subocular spine strongly developed, surpassing external margin of eye and visible from above. Antennae dark brown with scapus short and cylindrical and pedicel elongate, barrel-shaped. Clypeus elongate and narrow, slightly longer than frons. Labium brown, reaching metacoxae.

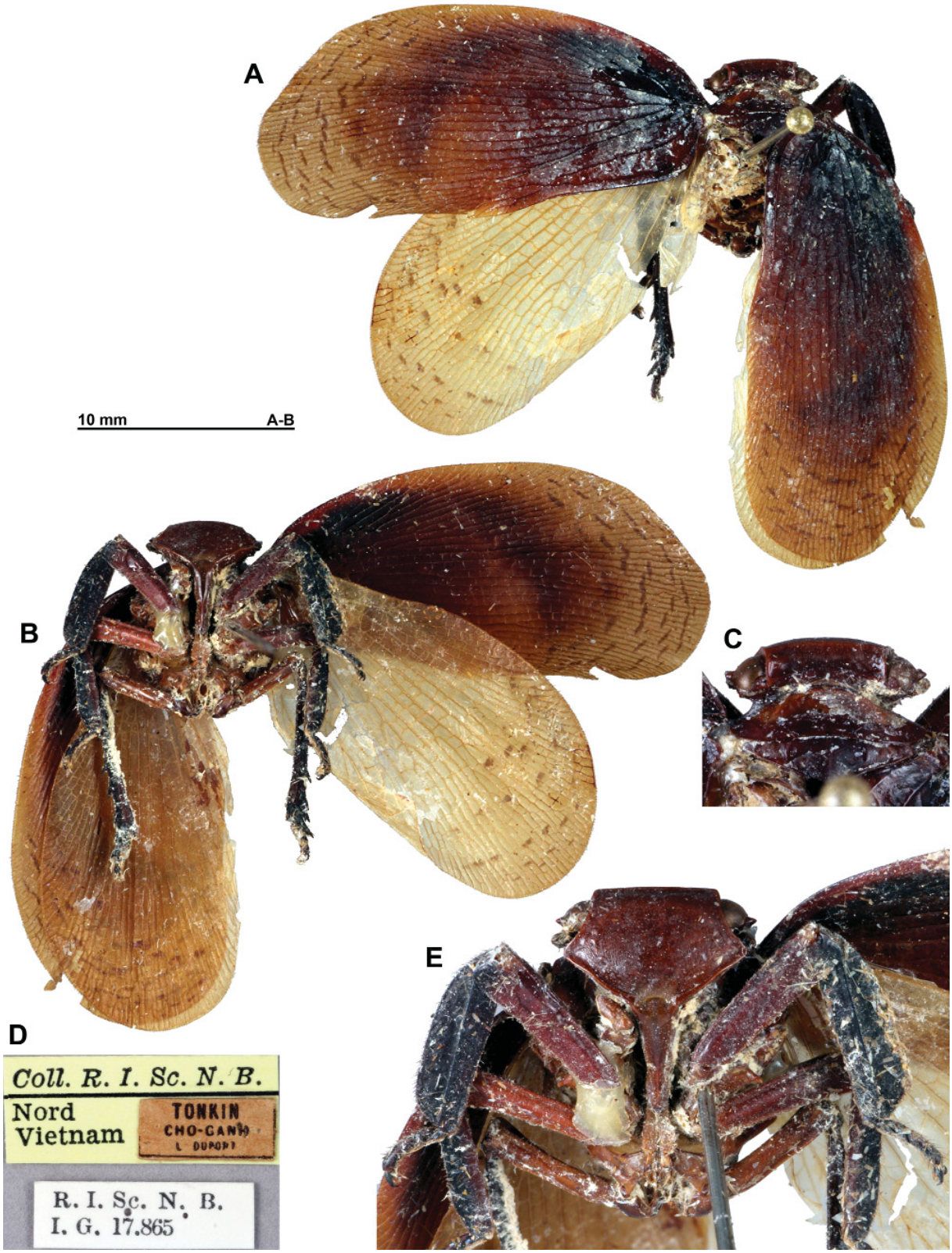

Fig. 19. *Purusha vietnamica* sp. nov., holotype, ♂ (RBINS). **A**. Habitus, dorsal view. **B**. Habitus, ventral view. **C**. Head and thorax, dorsal view. **D**. Labels. **E**. Normal view of frons. C–E not to scale.

Thorax (Fig. 19C). Dark reddish brown with anterior half of pronotum slightly paler; broader than length of pro- and mesonotum taken together; pronotum shorter than mesonotum and with obsolete median carina; mesonotum with 3 longitudinal obsolete carinae.

Tegmina (Fig. 19A–B). Reddish brown, with base and a transverse unclear band after mid length darker; apical ⅕ yellow brown, paler zone extending along costal, narrowing to basal ⅓; on apical ⅕, several concentric, irregular and interrupted rows of narrow dark brown lines, parallel to apical margin of tegmen, number of rows varying from 2 anteriorly along costal margin to 4 in middle; costal and sutural margins subparallel; apical margin broadly rounded.

Hind wings (Fig. 19A–B). Very pale yellowish brown, slightly darker towards distal portion; distal third with numerous more or less transverse brown markings arranged in concentric rows parallel to distal margin towards apex; apical margin broadly rounded.

Legs (Fig. 19A–B). All femora dark reddish brown; tibiae and tarsi black. Pro- and mesofemora dorsoventrally flattened, widening from base to apex. Pro- and mesotibiae dorsoventrally flattened, broader than corresponding femur and with apicolateral angle rounded; protibiae wider than mesotibiae. Metatibiae with 5 lateral and 9 apical spines. First metatarsomere with strong spine at each apicolateral angle; ventrally, large pad of microsetae and 11 spines arranged in two irregular rows. Second metatarsomere with ventral pad of microsetae. Third metatarsomere with narrow pad of microsetae. Metatibiotarsal formula: (5) 9/11/0.

Abdomen. Yellow-brown.

Male genitalia (Fig. 21)

Pygofer with dorsal half of lateral portion of posterior margin strongly projecting in laminate process directed posteriorly and slightly ventrally in lateral view and slightly laterally in ventral view; process rounded apically; ventral half of posterior margin excavate in lateral view; ventral portion of posterior margin slightly sinuate in ventral view; dorsal portion of pygofer strongly narrowing with posterior margin strongly excavate; anterior margin strongly sinuate in lateral view (Fig. 21A, D). Anal tube large, broadly obovate, dorsoventrally flattened; apical margin broadly rounded in dorsal view; lateral margins abruptly widening posteriorly to anal column and subparallel on median ⅓ in dorsal view, bisinuate in lateral view, more strongly so near base; anal column at basal ⅓ (Fig. 21A, C). Gonostyli elongate, subrectangular with dorsal and ventral margins sinuate in lateral view, with small subapical process on ventral margin directed posteriorly; dorsal margin sinuate in dorsal view, with rather small incurved lamina at posterodorsal angle, ending with tooth anteriorly and posteriorly; lateral hook near posterodorsal angle; ventral margin strongly emarginate on distal half in ventral view, forming a broad opening with mediobasal tooth directed posteriorly (Fig. 21A–B, D). Phallobase longer than broad in dorsal view, with dorsal strong elongate pointed process directed posterodorsally, laterobasal laminate strongly upcurved processes and horizontal lateral carina ended in a short, posterior, apically narrowly rounded process directed posteriorly; ventrally, elongate, deeply furcate process slightly curved ventrally, apices of furca pointed; dorsally to furcate process, pair of processes surpassing furcate process, curved ventrally on basal ⅔ and ended with a blunt hook curved dorsally (Fig. 21E–F). Phallus with two elongate, subparallel, slightly sword-shaped distally, incurved processes, ventral one longer than dorsal one; dorsal process slightly more curved medioanterodorsally than ventral one; mediodorsally, pair of large elongate processes with excavate portion dorsally before apex (Fig. 21E–F).

Female (Fig. 20)

Head (Fig. 20C–D). Dark reddish brown with clypeus darker, slightly narrower than thorax. Vertex strongly transverse, concave and with anterior margin very slightly curved in dorsal view. Frons broader than long, slightly convex and with lateral angles produced laterally. Subocular spine strongly developed,

surpassing external margin of eye and visible from above. Antennae dark brown with scapus short and cylindrical and pedicel elongate, barrel-shaped. Clypeus elongate and narrow, slightly longer than frons. Labium brown, reaching metacoxae.

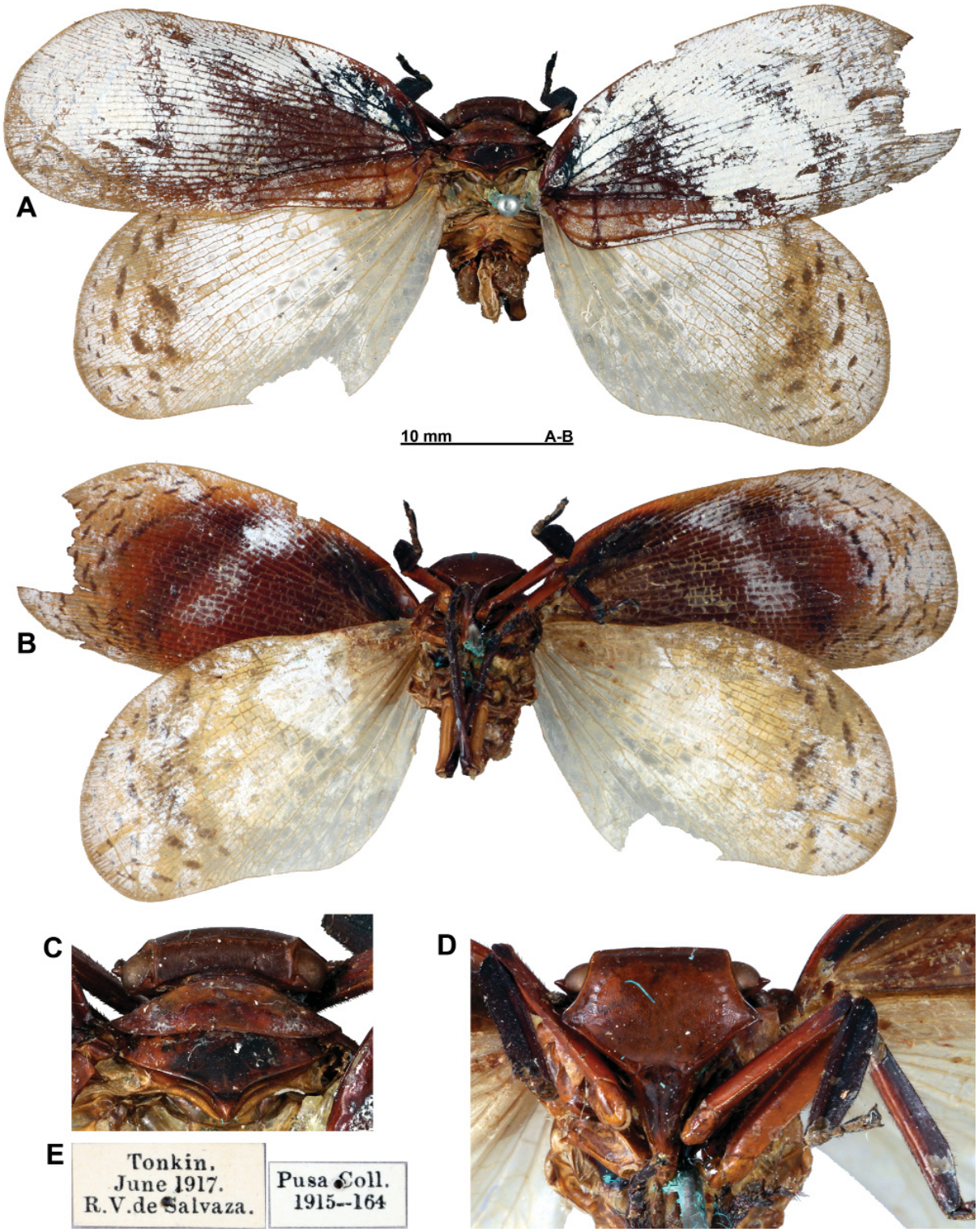

Fig. 20. *Purusha vietnamica* sp. nov., paratype, ♀ (BMNH). **A**. Habitus, dorsal view. **B**. Habitus, ventral view. **C**. Head and thorax, dorsal view. **D**. Normal view of frons. **E**. Labels. C–E not to scale.

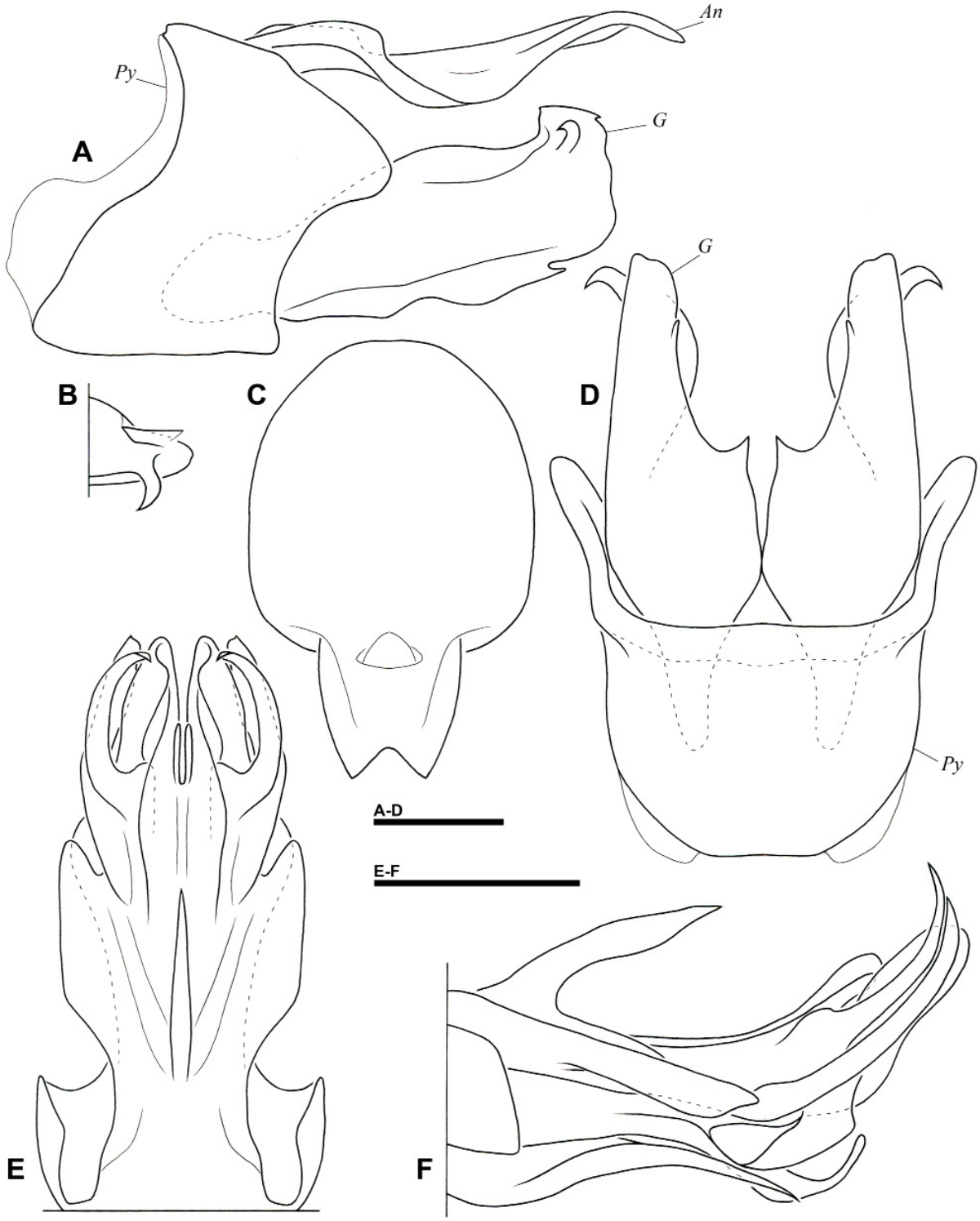

Fig. 21. *Purusha vietnamica* sp. nov., holotype, male genitalia (RBINS). **A**. Pygofer, anal tube and gonostylus, left lateral view. **B**. Posterodorsal process of left gonostylus, dorsal view. **C**. Anal tube, dorsal view. **D**. Pygofer and gonostyli, ventral view. **E**. Aedeagus, dorsal view. **F**. Aedeagus, left lateral view. Abbreviations: *An* = anal tube; *G* = gonostyli; *Py* = pygofer. Scale bars = 1 mm.

Thorax (Fig. 20C). Reddish brown with central portion of mesonotum darker; broader than length of pro- and mesonotum taken together; pronotum shorter than mesonotum, with obsolete median carina and weak transversal groove; mesonotum with 3 longitudinal obsolete carinae.

Tegmina (Fig. 20A–B). Reddish brown with base and transverse unclear band after mid-length darker, densely covered in white waxy secretion dorsally; apical ⅕ yellow brown, paler zone extending along costal, narrowing to basal ⅓; on apical ⅕, several concentric, irregular and interrupted rows of narrow dark brown lines, parallel to apical margin of tegmen, number of rows varying from 1 anteriorly along costal margin to 5 in middle; costal and sutural margins weakly diverging towards ⅘; apical margin broadly rounded.

Hind wings (Fig. 20A–B). Very pale yellowish brown, slightly darker towards distal portion, covered in white waxy secretion; distal third with numerous more or less transverse brown markings arranged in 5 irregular concentric rows parallel to distal margin towards apex, lines of 2 more distal rows narrower; apical margin broadly rounded.

Legs (Fig. 20A–B). All femora reddish brown; pro- and metatibiae and all tarsi black-brown; mesotibiae reddish brown with lateral portion black-brown. Pro- and mesofemora dorsoventrally flattened, widening from base to apex. Pro- and mesotibiae dorsoventrally flattened, broader than corresponding femur and with apicolateral angle rounded; protibiae wider than mesotibiae. Metatibiae with 5 lateral and 9 apical spines. First metatarsomere with strong spine at each apicolateral angle; ventrally, large pad of microsetae and 11 spines arranged in two irregular rows. Second metatarsomere with ventral pad of microsetae. Third metatarsomere with narrow pad of microsetae. Metatibiotarsal formula: (5) 9/11/0.

Abdomen (Fig. 20A–B). Yellow-brown.

Distribution

North Vietnam (Fig. 4).

Biology

Unknown.

Discussion

The genus *Purusha* is one of the most conspicuous genera among the Eurybrachidae. Schmidt (1908) placed it in the tribe Eurybrachini of the Eurybrachinae and this view is followed here. Despite their large size and the large distribution of the genus in Southeast Asia, specimens of *Purusha* remain very scarce in the collections. Very little information on their natural history is available to date; their host plants, development, phenology etc. remain undocumented. The sexual dimorphism in the genus matches what is observed in the genus *Eurybrachys* Guérin-Méneville, 1834 (Fig. 1A–B, Chatterjee 1933), with the males much smaller showing brown hind wings while they are white in the larger females. The present work is the second contribution dedicated to a genus of Eurybrachini after the revision of *Nicidus* Stål, 1858 (Constant 2008). The three other genera of Eurybrachini still require revision but this work is impeded by the lack of material, especially males associated with females, the fact that most species were described from single female specimens and the sexual dimorphism that does not allow easy association of males and females of the same species.

Acknowledgements

I thank Mr Mick Webb (BMNH), Dr Igor Malenovsky (MMBC), Mr Cédric Audibert (MHNL), Mrs Gunvi Linberg (NHRS), Mr Amoret Spooner (OUMNH), Mrs Yvonne van Nierop (RMNH), Dr Peter

Michalik (ZIMG) and Dr Adam Stroinski (ZMPA) for the loan of specimens under their care; Dr Mike Wilson (National Museum of Wales, Cardiff, U.K.) who transported important types from BMNH; Prof. Thierry Bourgoin (Museum national d'histoire naturelle, Paris, France), Prof. Murray J. Fletcher (Orange Agricultural Institute, Australia), Mr Pol Limbourg (RBINS) and Dr Patrick Grootaert (RBINS) for their support and comments; Dr Michael Geiser (BMNH) for the information about Vitalis de Salvaza's collection. Special thanks to Mr John Moore (Thailand), Mr Satawan Atdhabhan (Thailand) and Mr Kawin Jiaranaisakul (Thailand) for the permission to use their photographs and data, and to Mr Les Day for his photographs and for the male of *P. reversa*, the key specimen which allowed me to resolve the puzzle of this revision. This study benefitted from funds from the European Union (Synthesys Project – Grant GB-TAF-1642) for a visit to the collection of BMNH in 2011.

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Manuscript received: 3 June 2019
Manuscript accepted: 4 October 2019
Published on: 7 February 2020
Topic editor: Gavin Broad
Section editor: Anna Namyatova
Desk editor: Kristiaan Hoedemakers

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Jahr/Year: 2020

Band/Volume: 0602

Autor(en)/Author(s): Constant Jerome

Artikel/Article: Revision of the Eurybrachidae (XV). The Oriental genus Purusha Distant, 1906 with two new species and a key to the genera of Eurybrachini (Hemiptera: Fulgoromorpha: Eurybrachidae) 1-40