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Research article

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Review of the Asian Thaumastodinae (Coleoptera, Byrrhoidea, Limnichidae), with a phylogeny of the genera

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Abstract. The Asian species of the subfamily Thaumastodinae Champion, 1924 are reviewed. Seven new species are described: *Acontosceles borneensis* sp. nov., *Pseudeucinetus papuanus* sp. nov., *Mexico ogasawaraensis* sp. nov., *M. baliensis* sp. nov., *M. papuanus* sp. nov., *M. palauensis* sp. nov. and *M. borneensis* sp. nov. The genus *Babalimnichus* Satô, 1994 is treated as a junior synonym of the genus *Mexico* Spilman, 1972, and three known species of the genus *Babalimnichus* are transferred to *Mexico*, viz. *M. taiwanus* (Satô, 1994) comb. nov., *M. masamii* (Satô, 1994) comb. nov. and *M. splendens* (Hernando & Ribera, 2003) comb. nov. Additional specimen data are shown, and new distributional records are as follows: *Acontosceles chujoi* Yoshitomi & Satô, 2005 from Vietnam; *A. zetteli* Pütz, 2008 from Laos; *Pseudeucinetus javanicus* Yoshitomi & Putra, 2010 from Lombok Island; *Mexico taiwanus* (Satô, 1994) comb. nov. from Lutao, Lanhsu and the Yonaguni-jima Islands; and *M. masamii* (Satô, 1994) comb. nov. from Kume-jima. A species list of the subfamily Thaumastodinae is given, with ZooBank LSIDs. The phylogenetic relationships of the thaumastodine genera are discussed.

Keywords. Coleoptera, Limnichidae, Thaumastodinae, new species, new synonym, identification key, checklist.

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Introduction

Limnichidae Erichson, 1846 (minute marsh-loving beetles), a 'shore beetle' family (Jäch 1998), includes both riparian and littoral species, and has about 400 known species in 37 genera (Hernando & Ribera 2005a). This family is subdivided into four subfamilies (Limnichinae Erichson, 1846; Hyphalinae Britton, 1971; Cephalobyrrhinae Champion, 1925; and Thaumastodinae Champion, 1924) and has not been well studied taxonomically. Furthermore, the phylogenetic position of the family and its subfamilies is still not understood (Hernando & Ribera 2005a). The phylogenetic placement of Limnichidae and its possible non-monophyly has been considered previously by many authors, both informally (e.g., Hinton 1939; Crowson 1978) and with cladistic analyses (e.g., Lawrence 1988; Beutel 1995). Costa *et al.* (1999) mentioned the phylogenetic position of the family and its subfamilies, but their relationships remained uncertain. The monophyly of the family Limnichidae was not supported, but the families Limnichidae, Dryopidae and Heteroceridae constitute a monophyletic clade. Kundrata *et al.* (2017) analysed the molecular phylogeny of Byrrhoidea and Buprestoidea, and three subfamilies (all except

Hyphalinae) of the family Limnichidae were treated. The family Limnichidae was a paraphyletic group due to Chelonariidae and Heteroceridae.

Thaumastodinae Champion, 1924 (so-called 'jumping shore beetles') is one of four subfamilies of the family Limnichidae and is represented by five genera from the Palearctic, Oriental, Australian and Neotropical Regions (see Appendix 1). The members of this subfamily have interesting morphological characters, e.g., capable of jumping using the hind legs, elongate body shape, and large eyes situated dorsally and separated narrowly on the vertex. In fact, Heller (1921) mistakenly stated that the genus *Pseudeucinetus* Heller, 1921, the first representative of this subfamily, was a member of the family Melandryidae Leach, 1815, and it was Champion (1924b) who recognized it as a member of Limnichidae. Zoogeographically, a disjunct distribution between the Oriental and Neotropical Regions (except for some species in the Palearctic and Australian Regions) is shown, but the reason for this distributional pattern is unclear (Hernando & Ribera 2005a). The Neotropical species have been relatively well studied (Spilman 1959, 1966; Wooldridge 1988; Skelley 2005), but the Oriental ones have not.

In this paper, I review the Asian genera and species of the subfamily Thaumastodinae and discuss the phylogenetic relationships of the genera.

Material and methods

Taxonomy

General observations and dissections were made using a Leica MZ95 stereo microscope. Microstructures of the dissected parts were studied in pure glycerine under an Olympus BH-2 compound microscope. After observation, the dissected parts were mounted on the same card as the specimen. Photographs were taken using a Leica MZ95 and combined in Helicon® Focus ver. 4.70.5 Pro (Helicon Soft® Limited). Some structures were observed with an SEM (Hitachi S-225), after coating with gold. Values in parentheses refer to the average.

Abbreviations for institutes

BPBM = Bishop Museum, Honolulu, Hawaii, USA
EUMJ = Ehime University Museum, Matsuyama, Japan
ITBC = BORNEENSIS Collection of the Institute for Tropical Biology & Conservation, Sabah University, Malaysia
NME = Naturkundemuseum, Erfurt, Germany
NMNS = National Museum of Natural Science, Taichung, Taiwan
NMW = Naturhistorisches Museum, Vienna, Austria
NSMT = National Science Museum, Tsukuba, Japan

Abbreviations for body measurements

EL = length of elytra at suture
EW = maximum width of elytra
HW = head width across eyes
PL = mesal length of pronotum
PW = maximum width of pronotum
TL = total length (PL+EL)

Abbreviations for male genitalia measurements (Fig. 1)

BL = length of basal piece
LL = length of lateral lobe
ML = length of median lobe

Phylogeny

For the phylogenetic analyses, I selected four genera from the subfamily as ingroups and one genus of the family Limnichidae as an outgroup:

Ingroups: *Acontosceles* Champion, 1924; *Pseudeucinetus* Heller, 1921; *Mexico* Spilman, 1972; and *Martinius* Spilman, 1959 (Thaumastodinae)

Outgroup: *Limnichus* Latreille, 1829 (Limnichinae)

Fourteen characters were selected for phylogenetic analysis (Appendix 2). Characters were coded as '0', '1' or '2', and the data matrix is shown in Appendix 3. WinClada ver. 10.00.08 (Nixon 2002) and NONA ver. 2.0 (Goloboff 1999) were used for the analyses.

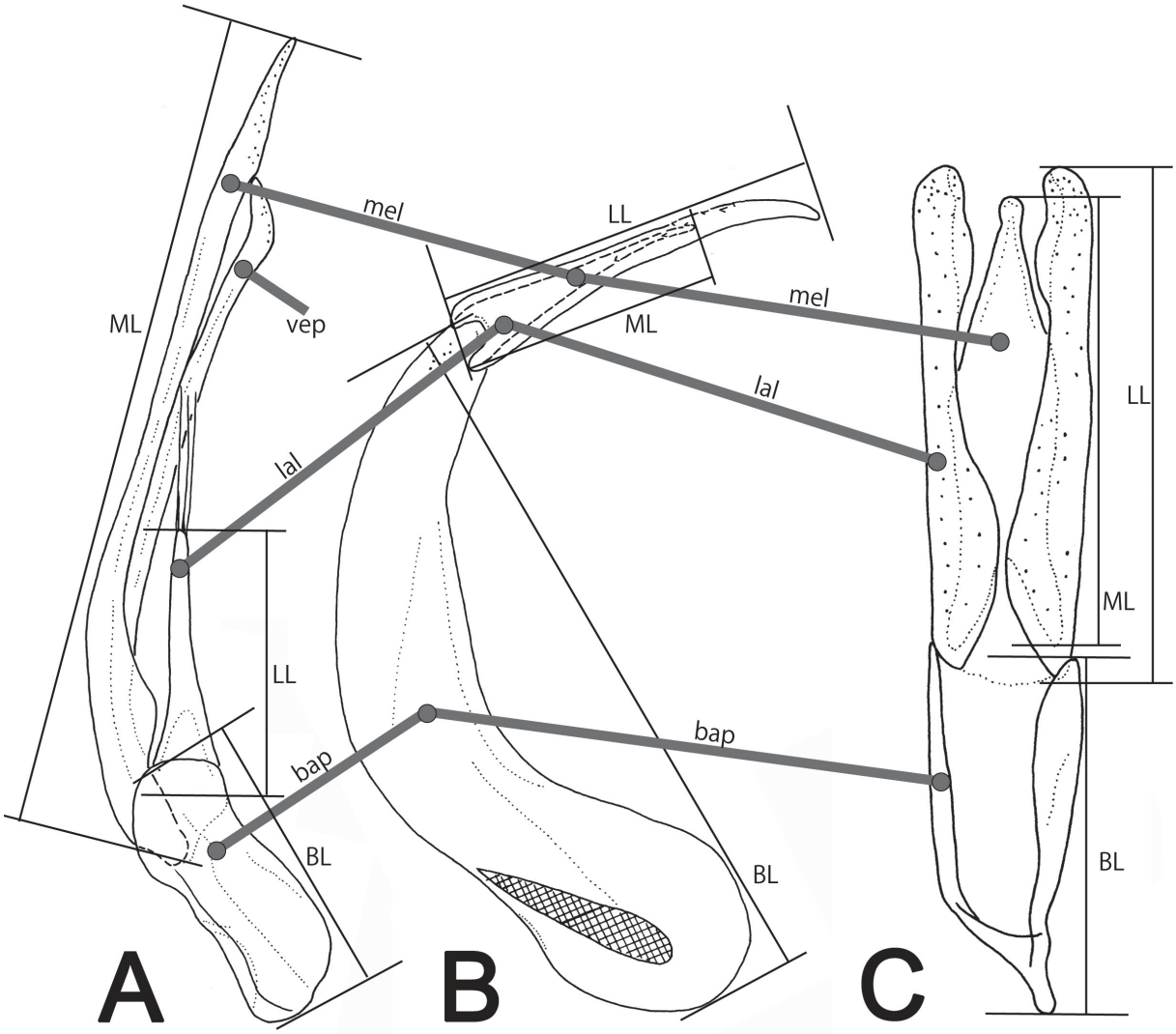

Fig. 1. Aedeagus, showing the terminology and the method of measurements. **A**. *Mexico* Spilman, 1972, left lateral view. **B**. *Acontosceles* Champion, 1924, left lateral view. **C**. *Pseudeucinetus* Heller, 1921, ventral view. Abbreviations: bap = basal piece; lal = lateral lobe; mel = median lobe; vep = ventral plate; BL = length of basal piece; LL = length of lateral lobe; ML = length of median lobe.

Results

Taxonomic account

Class Insecta Linnaeus, 1758
Order Coleoptera Linnaeus, 1758
Suborder Polyphaga Emery, 1886
Series Elateriformia Crowson, 1960
Superfamily Byrrhoidea Latreille, 1804
Family Limnichidae Erichson, 1846

Subfamily **Thaumastodinae** Champion, 1924

Thaumastodinae Champion, 1924a: 25 (type genus: *Thaumastodus* Champion, 1924 [junior synonym of *Pseudeucinetus* Heller, 1921]).

Thaumastodinae – Spilman 1959: 111; 1972: 113 [key to genera]. — Skelley 2005: 119.

Diagnosis

Body elongate to oblong, slightly shining, closely covered with short suberect setae. Eyes (Fig. 2) large, situated on dorso-lateral parts of head, separated narrowly on vertex. Antennae short to relatively short, 7- or 11-segmented, compactly articulated in terminal 6 antennomeres. Basal margin of elytra not crenulate. Tarsal formula 4-4-4 or 4-5-5. Hind legs long, capable of jumping; hind tibiae bearing spines. Sexual dimorphism distinct in fore tarsi (genus *Pseudeucinetus*) or in sternite VII.

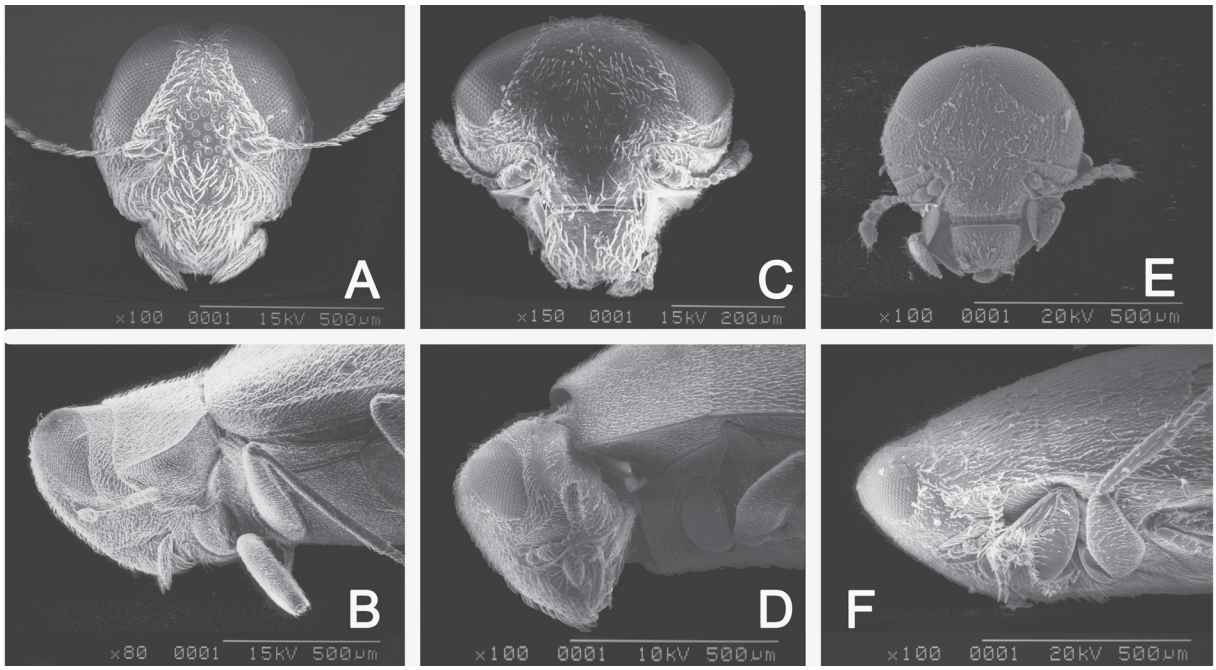

Fig. 2. Head in frontal (A, C, E) and lateral (B, D, F) views. **A, D**. *Acontosceles chujoi* Yoshitomi & Satô, 2005. **B, E**. *Mexico masamii* (Satô, 1994). **C, F**. *Pseudeucinetus zygops* Heller, 1921.

Key to genera of the subfamily Thaumastodinae

1. Tarsal formula 4-5–5; legs long and slender; antennal insertions situated near eyes (Fig. 2A); metaventrite short, not covering metacoxa (Fig. 3A); in freshwater environments; Oriental Region ..... ***Acontosceles*** Champion, 1924
– Tarsal formula 4-4-4; legs long and stout; antennal insertions situated near mandibles (Fig. 2C, E); metaventrite projecting posteriorly, covering metacoxa (Fig. 3B); in both fresh- and saltwater environments 2

2. Frons distinctly projecting anteriorly, narrow (Fig. 2E–F); male fore tarsi enlarged (Fig. 3E); in freshwater environments; Oriental Region ..... ***Pseudeucinetus*** Heller, 1921
– Frons gently projecting anteriorly, wide (Fig. 2C–D); male fore tarsi normal; on rocky seashores 3

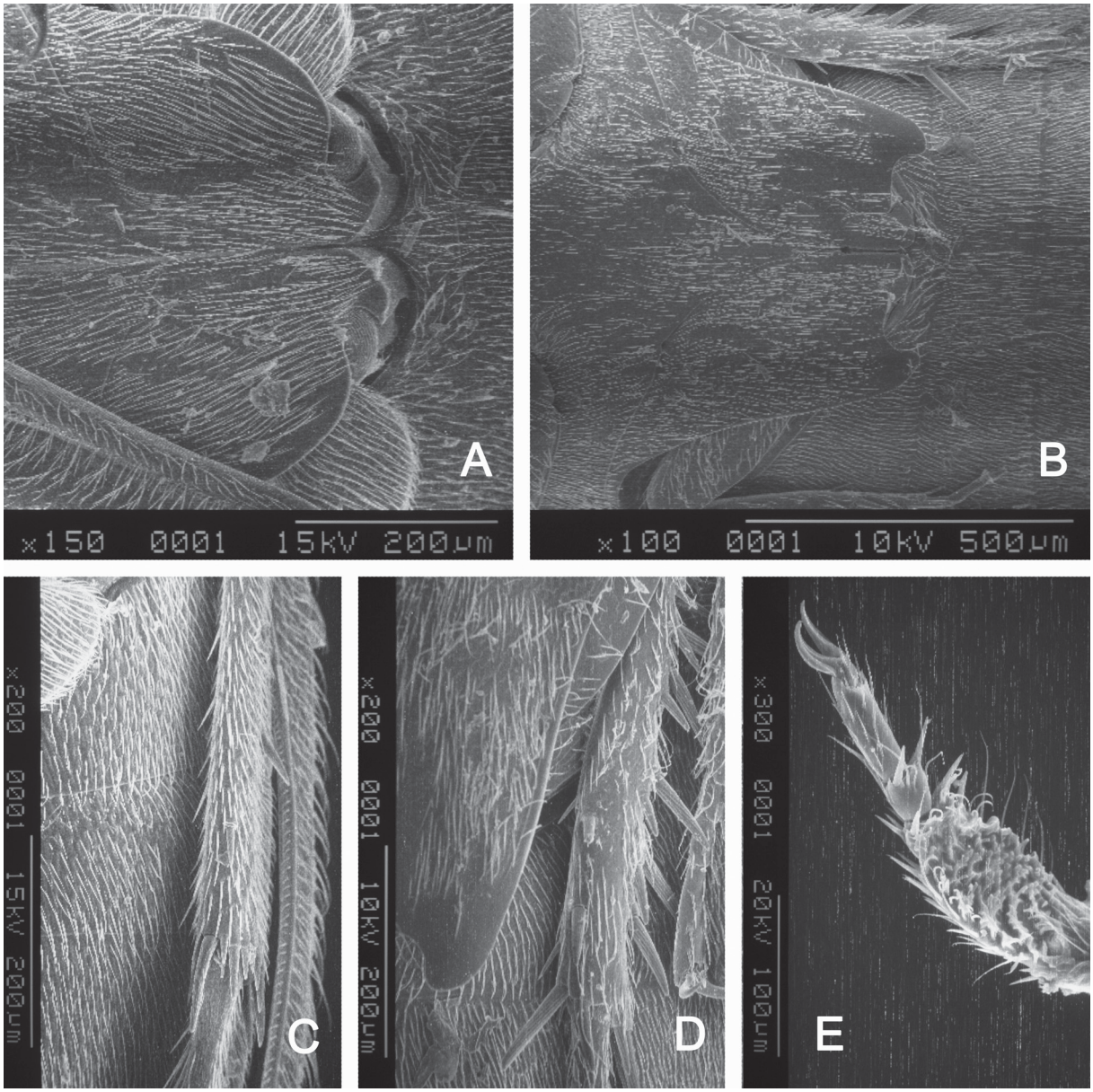

Fig. 3. Metacoxal plates (A–B), hind tibiae (C–D) and male protarsus (E). **A, C**. *Acontosceles chujoi* Yoshitomi & Satô, 2005. **B, D**. *Mexico taiwanus* (Satô, 1994). **E**. *Pseudeucinetus zygops* Heller, 1921.

3. Antennae 7-segmented; antennal groove on gena absent; Neotropical Region..... .....***Martinius*** Spilman, 1959
– Antennae 11-segmented; antennal groove on gena present; Neotropical and Oriental Regions..... .....***Mexico*** Spilman, 1972

Genus ***Acontosceles*** Champion, 1924

Acontosceles Champion, 1924a: 27 (type species: *Acontosceles hydroporoides* Champion, 1924).

Diagnosis

Body elongate. Gena wide; antennal groove absent. Antennae slender, relatively long, 11-segmented; antennal insertions situated near eyes. Legs long and slender; tarsal formula 4-5-5.

Remarks

This genus was subdivided into two species groups by Pütz (2008) mainly based on the male genital characters. However, the points differentiating the two groups are obvious and quantitative features (see also Yoshitomi & Putra 2011), and so the species-group concept needs to be revised.

Biological notes

The habitat of this genus (Fig. 4A) is freshwater environments, i.e., waterfalls (type locality of *A. chujoi* Yoshitomi & Satô, 2005), rivers and streams. The adults are found on wet rocks or actively flying. The larval stages are unknown.

Key to the males of the species of *Acontosceles*

1. Basal piece distinctly curved ventrally, expanded in basal part; parameres long and curved ventrally, minutely serrate on dorso-lateral margins in some species; body shape elongate to oblong-oval; legs relatively long; Japan to India, Indonesia .....2 (***A. hydroporoides*** species group)
– Basal piece slightly curved ventrally, not expanded in basal part; parameres short and almost straight, lacking serrae on dorso-lateral margins; body shape oblong-oval; legs relatively short; Indochina to Himalayas .....9 (***A. quatuordecimmaculosus*** species group)

2. Aedeagus distinctly curved (about 90–100°) ventrally in basal piece..... 5
– Aedeagus gently curved (about 120°) ventrally in basal piece..... 3

3. Lateral lobes serrate on dorso-lateral margins..... 4
– Lateral lobes lacking serrae on dorso-lateral margins .....***A. hydroporoides*** Champion, 1924

4. Basal piece slightly expanded in basal part; Indochina .....***A. chujoi*** Yoshitomi & Satô, 2005
– Basal piece robust, expanded in basal part; Japan and Taiwan.....***A. yorioi*** Satô, 1966

5. Lateral lobes serrate on dorso-lateral margins..... 6
– Lateral lobes lacking serrae on dorso-lateral margins; Philippines ..... ***A. negrosensis*** Pütz, 2008

6. Basal piece robust, expanded in basal part 7
– Basal piece slightly expanded in basal part; Borneo .....***A. borneensis*** sp. nov.

7. Basal piece curved in middle part..... 8
– Basal piece curved in caudal part; Philippines .....***A. jaechi*** Pütz, 2008

8. Lateral lobes shorter; Indonesia ..... ***A. javanicus*** Yoshitomi & Putra, 2011
– Lateral lobes longer; Philippines ..... ***A. tagalog*** Spilman, 1959

9. Apex of lateral lobes wide and truncate, with small denticles on lateral margins 10
– Apex of lateral lobes pointed, lacking denticles 11

10. Lateral margins of lateral lobes gently arcuate in dorsal view; Nepal ..... ***A. siwalikensis*** Pütz, 2008
– Lateral margins of lateral lobes straight in dorsal view; Thailand and Laos ..... ***A. zetteli*** Pütz, 2008

11. Basal piece relatively long; lateral lobes slightly curved in apical parts; Myanmar ..... ***A. quatuordecimmaculosus*** Pütz, 2008
– Basal piece relatively short; lateral lobes curved ventrally in apical parts; China ..... ***A. yunnanensis*** Pütz, 2008

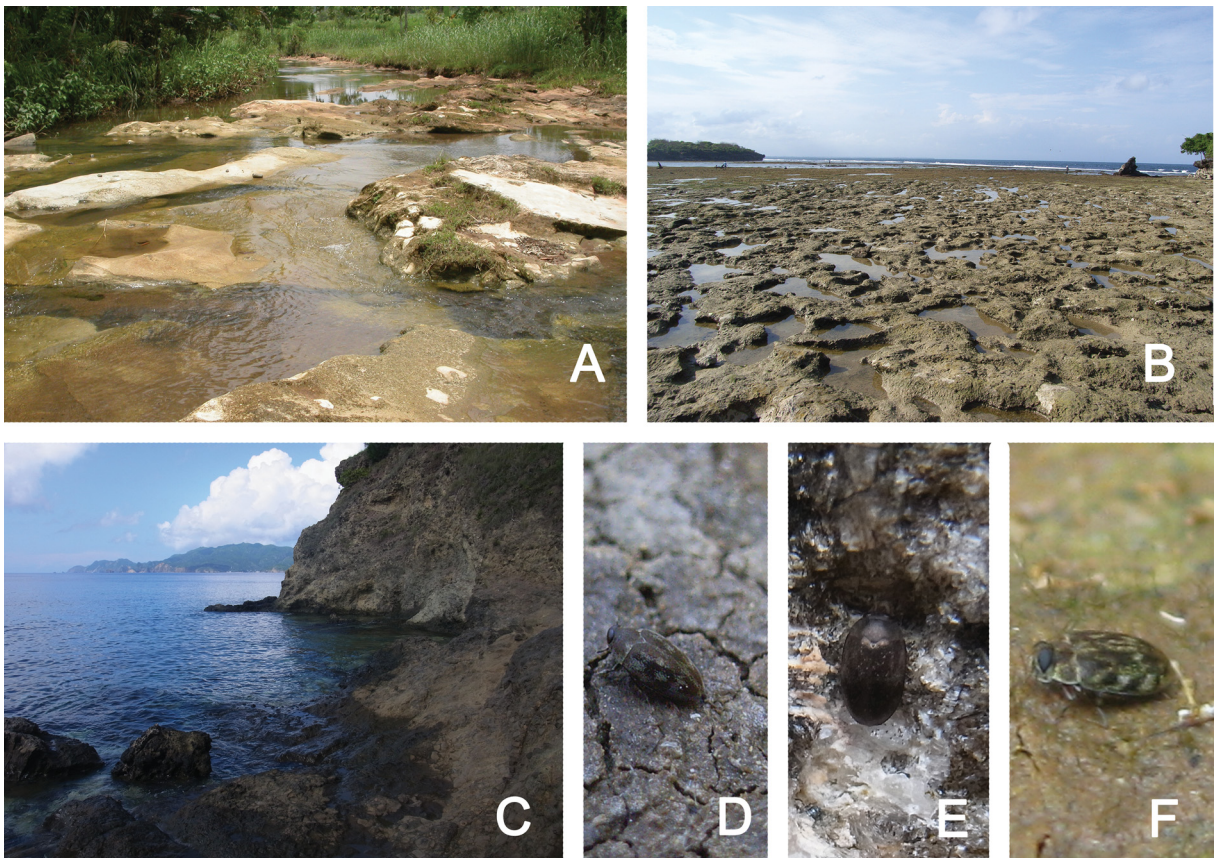

Fig. 4. Habitats (A–C) and living adults (D–F) of Asian Thaumastodinae Champion, 1924. **A**. Dondong River, Pengkol, Yogyakarta special Region, Java, Indonesia (type locality of *Acontosceles javanicus* Yoshitomi & Putra, 2011 (F) and *Pseudeucinetus javanicus* Yoshitomi & Putra, 2010 (D)). **B**. Nusa Dua, Bali, Indonesia (type locality of *Mexico baliensis* sp. nov.). **C**. Hirashima, Ogasawara, Japan (type locality of *Mexico ogasawaraensis* sp. nov.). **D**. Type locality of *Pseudeucinetus javanicus* Yoshitomi & Putra, 2010. **E**. *Mexico masamii* (Satô, 1994) in Shikinejima, Izu Islands. **F**. Type locality of *Acontosceles javanicus* Yoshitomi & Putra, 2011.

Acontosceles borneensis sp. nov.
urn:lsid:zoobank.org:act:2582F411-8790-4937-B6A0-248899FD9208
Figs 5A, 6

Etymology

This species is named after its type locality.

Material examined

Holotype

MALAYSIA • ♂; "SARAWAK: Nanga Pelagus 7-14. VIII. '58"; "T. C. Maa Collector BISHOP"; BPBM.

Paratypes

MALAYSIA • 1 ♂, 2 ♀♀; same collection data as for holotype; BPBM • 1 ♀; same collection data as for preceding; EUMJ • 2 ♀♀; "BORNEO: SARAWAK Merirai Valley nr Kapit, 30-300m, 1-6. VII. 58"; "T. C. Maa Collector BISHOP Mus."; BPBM • 1 ♀; "BORNEO: SARAWAK Bau, Lake Area 29-30. VIII. 1958"; "T. C. Maa Collector BISHOP"; BPBM.

Description

Male

Body. Oblong, subparallel-sided, slightly convex dorsally, weakly shiny, closely covered with suberect silver setae. Coloration of body blackish brown, but mouthparts and legs yellowish brown; elytra with obscure silver spots consisting of erect setae.

Head. Moderate in size; frons and clypeus closely covered with erect, long silver setae; clypeus with straight anterior margin. Eyes large, prominent dorso-laterally.

Antennae. Reaching about proximal half of pronotum.

Pronotum. Widest at basal third, densely bearing short yellowish setae and minute scale-like setae; PW/PL 2.25–2.50 (2.34). Scutellum small, subtriangular.

Elytra. Oblong, subparallel-sided near base to apical fifth, densely covered with short yellowish setae and minute scale-like setae, projecting ventrally in apical part; EL/EW 1.59–1.80 (1.72); EL/PL 4.17–4.63 (4.39); EW/PW 1.02–1.16 (1.10); TL/EW 1.97–2.22 (2.11).

Abdomen. Sternite VII (Fig. 6A) broad, gently arcuate along caudal margin, shallowly concave in median part, bearing about 20 long setae and three pairs of long and stout setae. Sternite VIII (Fig. 6B) membranous, bearing minute spines in apical parts. Sternite IX (Fig. 6C) moderately sclerotized, large, with small apical plates.

Aedeagus (Fig. 6D–E). Long, well sclerotized, strongly curved ventrally; basal piece oblong, expanded basally, evenly curved ventrally; lateral lobes long and slender, serrate on dorso-lateral margins, curved ventrally; median lobe long and slender, about 0.6 times as long as lateral lobe, gently curved ventrally; ML/BL 0.36; ML/LL 0.68.

Female

Sexual dimorphism distinct in the following characteristics: 1) frons and clypeus covered with short yellowish setae; 2) apical part of elytra projecting ventro-apically; 3) sternite VII (Fig. 6F) rather pointed on caudal margin, bearing about 40 long setae. Urosternite (Fig. 6G) well sclerotized, with long and

slender apodeme; lateral projections stout, bifid in apical parts. Ovipositor (Fig. 6H) well sclerotized; coxite sparsely punctuate, pointed at apices; approximate ratio of coxite and baculus (n = 1) of 1.0 : 1.7.

Measurements

Unsexed (n = 4): TL 2.17–2.25 (2.21) mm; PW 0.90–1.00 (0.96) mm; PL 0.40–0.42 (0.41) mm; EL 1.75–1.85 (1.80) mm; EW 1.00–1.10 (1.05) mm.

Distribution

Malaysia (Sarawak).

Remarks

This species belongs to the *hydroporoides* species group judging from characteristics of the male genitalia.

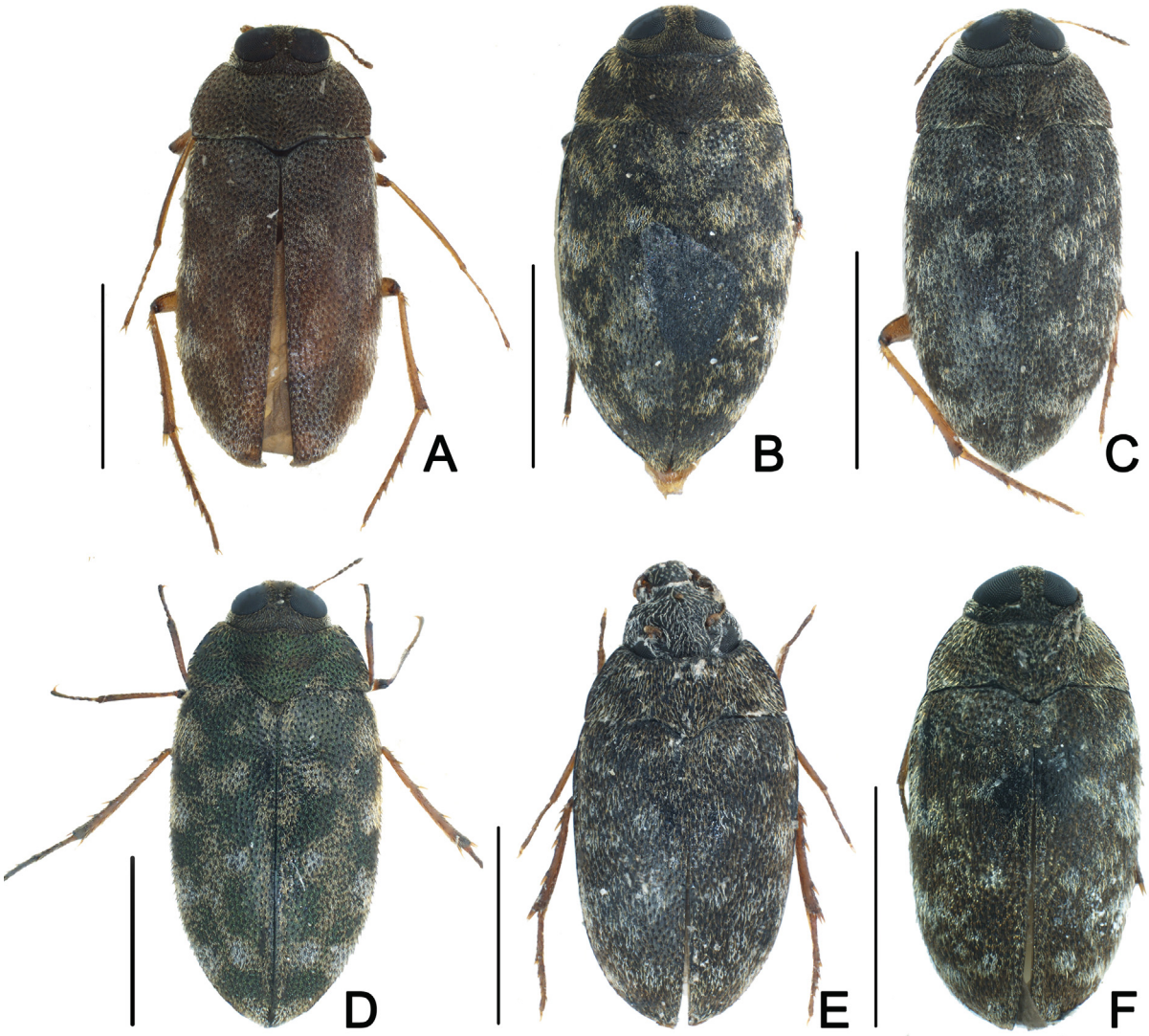

Fig. 5. *Acontosceles* spp. **A**. *A. borneensis* sp. nov., holotype (BPBM). **B**. *A. yorioi* Satô, 1966 (EUMJ). **C**. *A. hydroporoides* Champion, 1924 (NME). **D**. *A. chujoi* Yoshitomi & Satô, 2005 (EUMJ). **E**. *A. siwalikensis* Pütz, 2008 (NME). **F**. *A. zetteli* Pütz, 2008 (BPBM). Scale bars: 1.0 mm.

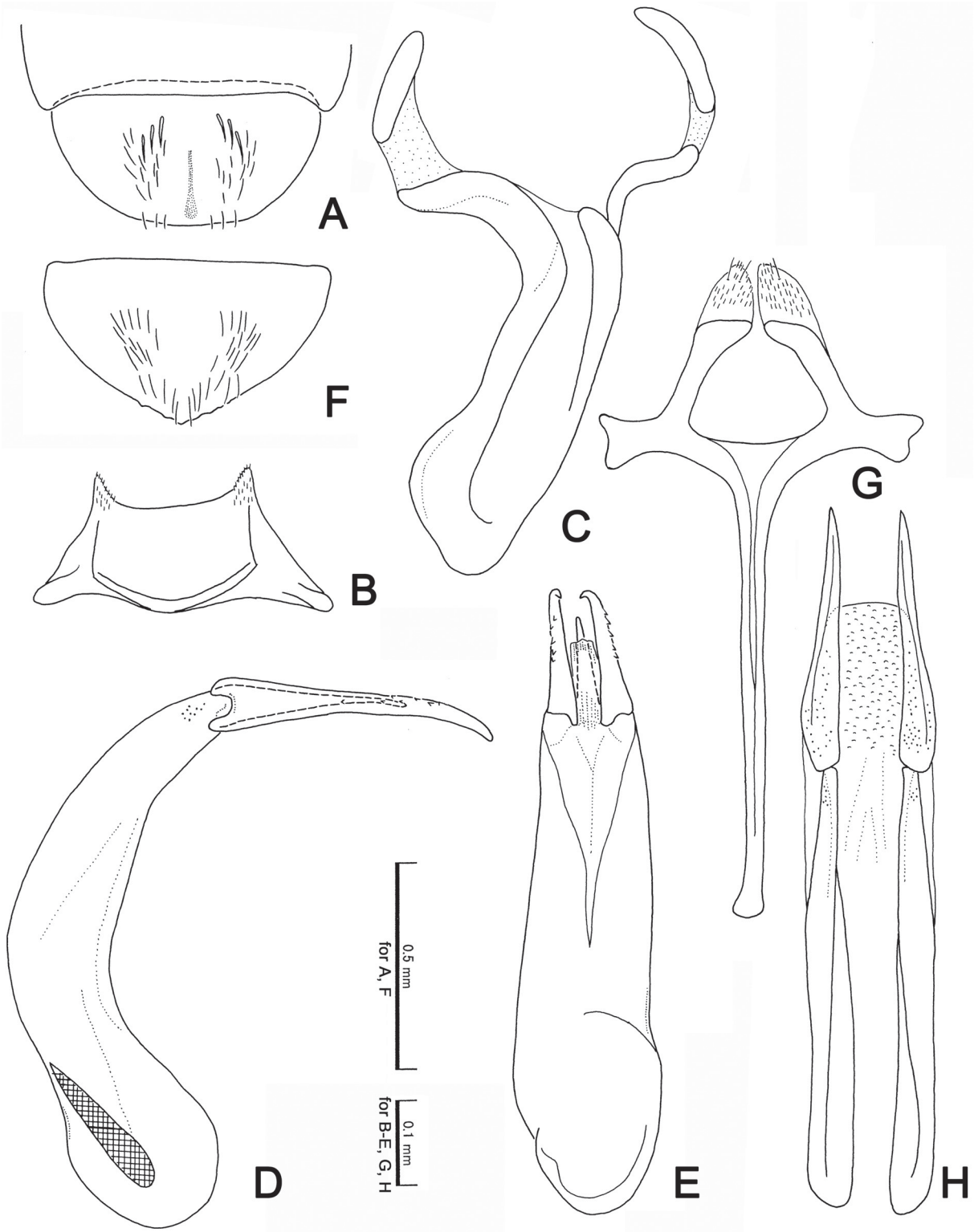

Fig. 6. *Acontosceles borneensis* sp. nov., male (A–E) and female (F–H) genitalia (holotype and paratype, BPBM). **A, F**. Sternite VII. **B**. Sternite VIII. **C**. Sternite IX. **D**. Aedeagus, left lateral view. **E**. Aedeagus, ventral view. **G**. Urosternite. **H**. Ovipositor.

Acontosceles chujoi Yoshitomi & Satô, 2005
Fig. 5D

Acontosceles chujoi Yoshitomi & Satô, 2005: 35.

Material examined

LAOS • 12 ex.; "[LA8] Nam Xan, near Ban Nahoung, Xieng Khouang Prov., Laos, 19°09.134″ N, 103°43.037″ E, 1453 m, 25. V. 2013 H. Yoshitomi leg."; EUMJ • 23 ex.; "[LA23] 2km W of Nam Chat, Laos, 19°290137″ N, 102°424900″ E, ca 814 m, 22. IV. 2018, H. Yoshitomi leg."; EUMJ.

VIETNAM • 5 ex.; "Tam Dao (950-1,050m) Vinh Phu Prov., Vietnam, 19. V. 1995 M. Sato leg."; EUMJ • 11 ex.; "[VN6] Ban Khoang, Lao Cai Prov., Vietnam, N22 24.423 E103 47.309, ca 1284 m, 22. VI. 2012, H. Yoshitomi leg."; EUMJ.

Distribution

Laos, Vietnam (new record).

Acontosceles yorioi Satô, 1966
Fig. 5B

Acontosceles yorioi Satô, 1966: 60.

Acontosceles hydroporoides – Satô 1965: 123 [misidentification]. — Spangler *et al.* 2001: 152 [Taiwan, error].
Acontosceles yorioi – Yoshitomi & Satô 2005: 36.

Material examined

JAPAN • 3 ex.; "Sate-gawa Kunigami, Okinawa 18-VI-2006 K. Takahashi leg."; EUMJ • 3 ex.; "Hijikawa, Kunigami, Okinawa, Ryukyus 15-VI-2003 K. Takahashi leg."; EUMJ.

TAIWAN • 1 ex.; "Taiwan Nantou Chunyang VI/11--VII/9/2002 C. S. Lin & W. T. Yang Malaise trap (KCN)"; "NMNS ENT 5240-73"; NMNS • 1 ex.; "Taiwan Nantou Chunyang V/7--VI/1/2002 C. S. Lin & W. T. Yang Malaise trap (KCN)"; "NMNS ENT 5237-3502"; NMNS • 1 ex.; "Taiwan Nantou Chunyang V/11-VII/3/2004 C. S. Lin & W. T. Yang Malaise trap (KCN)"; "NMNS ENT 5249-6740"; NMNS • 1 ex.; "Taiwan Pingtung Manchou Lite No: 169 Hsiang Rd. 3.8km IV/19--V/1/2009 M. L. Jeng & T. J. Chen Malaise trap"; NMNS.

Distribution

Japan: Ryukyu Islands (Okinawa-jima, Ishigaki-jima, Iriomote-jima); Taiwan.

Acontosceles siwalikensis Pütz, 2008
Figs 5E, 7

Acontosceles siwalikensis Pütz, 2008: 314.

Material examined

NEPAL • 1 ♂, 5 ex.; "NEPAL, Prov. Bheri Distr. Surkhet, 20km S Surkhet, Bheri-River 600m NN, 03. VI. 1995 leg. M. Hartmann"; NME • 1 ♂, 1 ♀; same collection data as for preceding; EUMJ.

Redescription

For a detailed description of the external features, see the original description (Pütz 2008). PW / PL 2.63; EL / EW 1.58; EL / PL 4.70; EW / PW 1.13; TL / EW 1.92.

Male

Sternite VII (Fig. 7A) gently arcuate on caudal margin, bearing about 30 long setae in median part. Sternite VIII (Fig. 7B) membranous. Sternite IX (Fig. 7C) slightly sclerotized, with long apical plates bifid in apical parts. Aedeagus (Fig. 7D–F) relatively short, well sclerotized, slightly curved ventrally; basal piece oblong, subparallel-sided; lateral lobes short and broad, arcuate on lateral margins, closely punctuate, with small projections in lateral parts of apices; median lobe slender, about 0.8 times as long as lateral lobe, slightly curved ventrally; ML / BL 0.40; ML / LL 0.80.

Female

Sexual dimorphism slight. Sternite VII (Fig. 7G) arcuate on caudal margin, bearing about 40 long setae. Urosternite (Fig. 7H) well sclerotized, with long and slender apodeme; lateral projections short, projecting antero-laterally. Ovipositor (Fig. 7I) well sclerotized; coxite closely punctuate, pointed at apices; approximate ratio of coxite and baculus (n = 1) 1.0 : 1.8.

Measurements

Male (n = 1): TL 2.28 mm; PW 1.05 mm; PL 0.40 mm; EL 1.88 mm; EW 1.19 mm.

Distribution

Nepal.

Acontosceles zetteli Pütz, 2008
Figs 5F, 8

Acontosceles zetteli Pütz, 2008: 317.

Material examined

LAOS • 1 ♂; "LAOS: Vientiane Prov. Ban Van Eue 15. XII. 1966"; "Native Collector BISHOP"; BPBM.

Redescription

Male

For a detailed description of the external features, see the original description (Pütz 2008). PW / PL 2.83; EL / EW 1.48; EL / PL 4.93; EW / PW 1.18; TL / EW 1.78.

Sternite VII (Fig. 8A) arcuate on caudal margin, bearing about 20 long setae in median part. Sternite VIII (Fig. 8B) membranous. Sternite IX (Fig. 8C) slightly sclerotized, with long apical plates bifid in apical parts. Aedeagus (Fig. 8D–F) short, well sclerotized, slightly curved ventrally; basal piece oblong, subparallel-sided; lateral lobes short and broad, straight on lateral margins, closely punctuate, minutely projecting ventro-laterally at apices; median lobe slender, about 0.8 times as long as lateral lobe, slightly curved ventrally; ML / BL 0.34; ML / LL 0.82.

Female

Unknown.

Measurements

Male (n = 1): TL 1.78 mm; PW 0.85 mm; PL 0.30 mm; EL 1.48 mm; EW 1.00 mm.

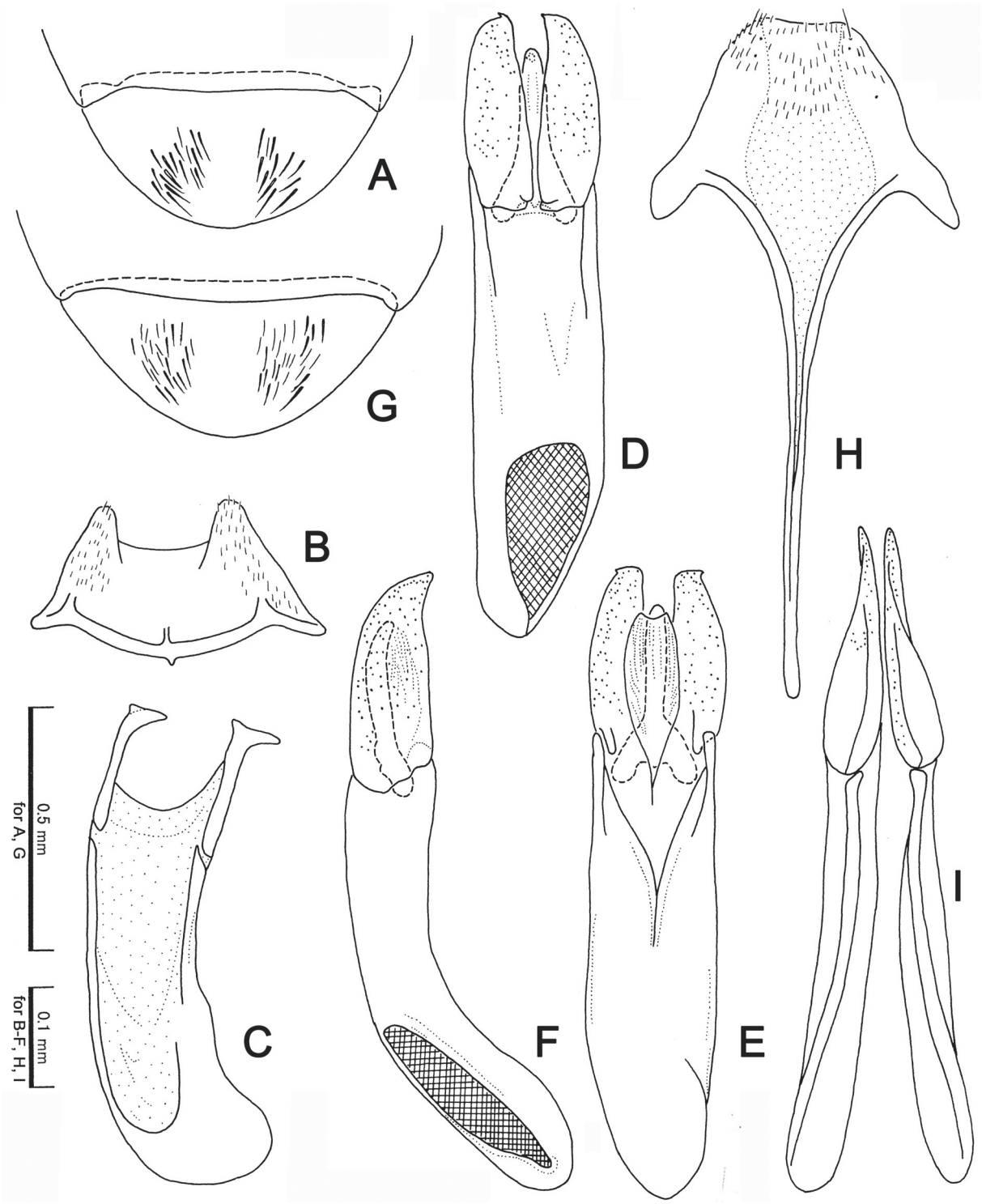

Fig. 7. *Acontosceles siwalikensis* Pütz, 2008, male (A–F) and female (G–I) genitalia (NME). **A, G**. Sternite VII. **B**. Sternite VIII. **C**. Sternite IX. **D**. Aedeagus, dorsal view. **E**. Aedeagus, ventral view. **F**. Aedeagus, left lateral view. **H**. Urosternite. **I**. Ovipositor.

Distribution

Thailand, Laos (new record).

Genus ***Pseudeucinetus*** Heller, 1921

Pseudeucinetus Heller, 1921: 155 (type species: *Pseudeucinetus zygops* Heller, 1921).
Thaumastodus Champion, 1924a: 25 (type species: *Thaumastodus fusiformis* Champion, 1924; synonymized by Champion 1924b).

Pseudeucinetus – Satô 1994: 173. — Spangler 1995: 395.

Diagnosis

Body oblong. Gena wide; shallow antennal groove present. Frons (Fig. 2E–F) narrow, distinctly projecting anteriorly. Antennae stout and short, 11-segmented; antennal insertions situated near mandibles. Legs relatively short and stout; tarsal formula 4-4-4; male fore tarsi enlarged (Fig. 3E).

Remarks

This genus is easily distinguishable from other genera of the subfamily Thaumastodinae by the unique shape of the head: frons distinctly projecting anteriorly and narrow between the eyes.

Biological notes

The habitat of this genus (Fig. 4A) is freshwater environments, i.e., rivers and streams. The adults are found in the splash zone of wet rocks, and frequently actively flying. In Java, Indonesia, *Pseudeucinetus*

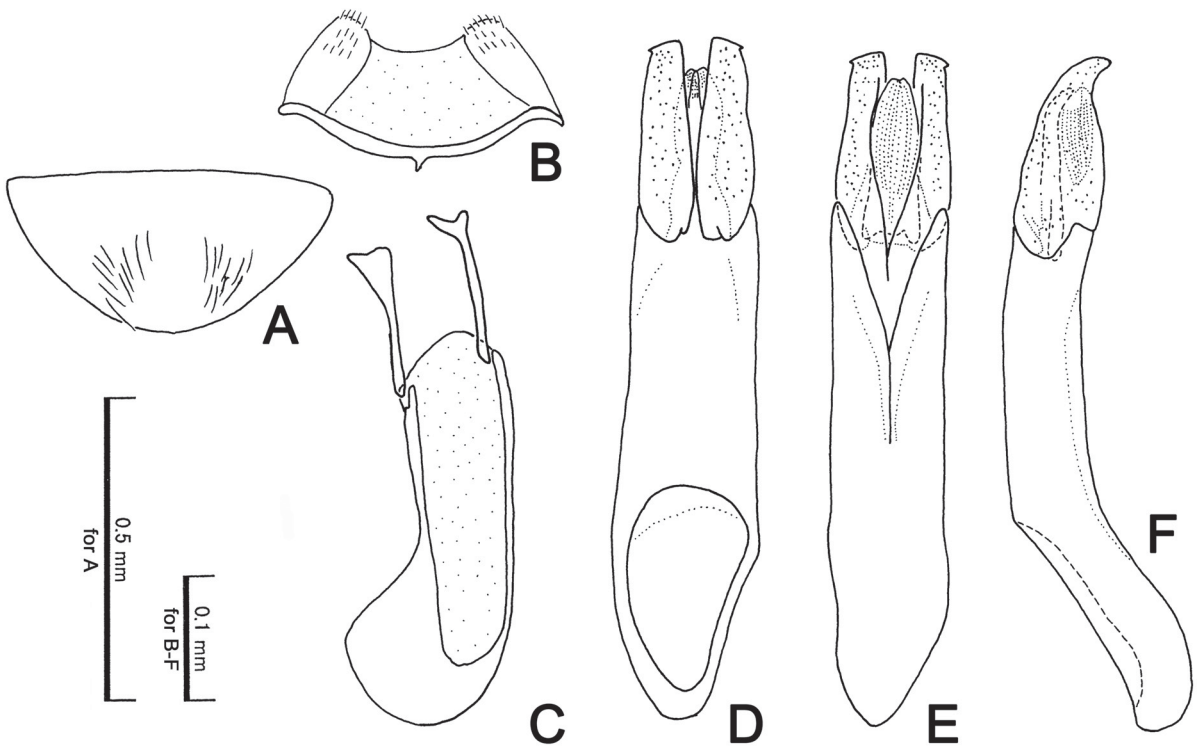

Fig. 8. *Acontosceles zetteli* Pütz, 2008, male genitalia (BPBM). **A**. Sternite VII. **B**. Sternite VIII. **C**. Sternite IX. **D**. Aedeagus, dorsal view. **E**. Aedeagus, ventral view. **F**. Aedeagus, left lateral view.

javanicus and *Acontosceles javanicus* were collected in the same place (Yoshitomi & Putra 2011). The adults were also collected by light trap. The larval stages are unknown.

Key to the males of the species of *Pseudeucinetus* (modified from Yoshitomi & Putra 2010)

1. Lateral lobes with a pair of small projections on inner margins 2
– Lateral lobes without any projections on inner margin 4

2. Subbasal inner projections of lateral lobes distinct and acute; basal piece short, about 0.5 times as long as lateral lobe ..... ***P. novabritannica*** Delève, 1973
– Subbasal inner projections of lateral lobes absent; basal piece long, about 0.7–0.8 times as long as lateral lobe 3

3. Subapical inner projections of lateral lobes small and obvious ..... ***P. papuanus*** sp. nov.
– Subapical inner projections of lateral lobes large and distinct ..... ***P. solomonicus*** Yoshitomi & Putra, 2010

4. Apex of median lobe of aedeagus acuminate in dorsal or ventral view 5
– Apex of median lobe of aedeagus nipple-like in dorsal or ventral view .. ***P. spilmani*** Spangler, 1995

5. Median lobe strongly pointed at apex, straight on lateral margins; basal piece gently curved dorsally ..... ***P. zygops*** Heller, 1921
– Median lobe weakly pointed at apex, arcuate on lateral margins; basal piece strongly curved dorsally 6

6. Apices of lateral lobes straight, acute; median lobe widest at the middle ..... ***P. uenoi*** Spangler, 1995
– Apices of lateral lobes obtuse; median lobe widest at basal part ..... ***P. javanicus*** Yoshitomi & Putra, 2010

Pseudeucinetus papuanus sp. nov.
urn:lsid:zoobank.org:act:978D5D6D-8D48-425D-AB1B-0536A2E10753
Figs 9A, 10

Etymology

This species is named after its type locality.

Material examined

Holotype

PAPUA NEW GUINEA • ♂; "NEW GUINEA NETH. Waris, S. of Hollandia, 450–500m VIII-I-2-1959"; "T. C. Maa Collector BISHOP"; "At Light"; BPBM.

Description

Male

Body. Oval, slightly convex dorsally, shiny, closely covered with suberect silver setae. Coloration of body black; antennae and legs blackish brown.

Head. Moderate in size; clypeus with straight anterior margin. Eyes large; distance between eyes about 3 eye facets.

Antennae. Short, reaching about anterior third of pronotum.

Pronotum. Widest at base; lateral margins straight; posterior margin gently bisinuate; PW/PL 2.33. Scutellum small, square.

Elytra. Oblong, widest at basal third; EL/EW 1.43; EL/PL 4.00; EW/PW 1.20; TL/EW 1.79. Fore tarsomere I largely expanded, longer than remaining fore tarsomeres combined.

Abdomen. Sternite VII (Fig. 10A) with three pairs of anterior extra setae (a) and two pairs of lateral extra setae (b). Sternite IX (Fig. 10B) moderately sclerotized, with long and pointed apical plates.

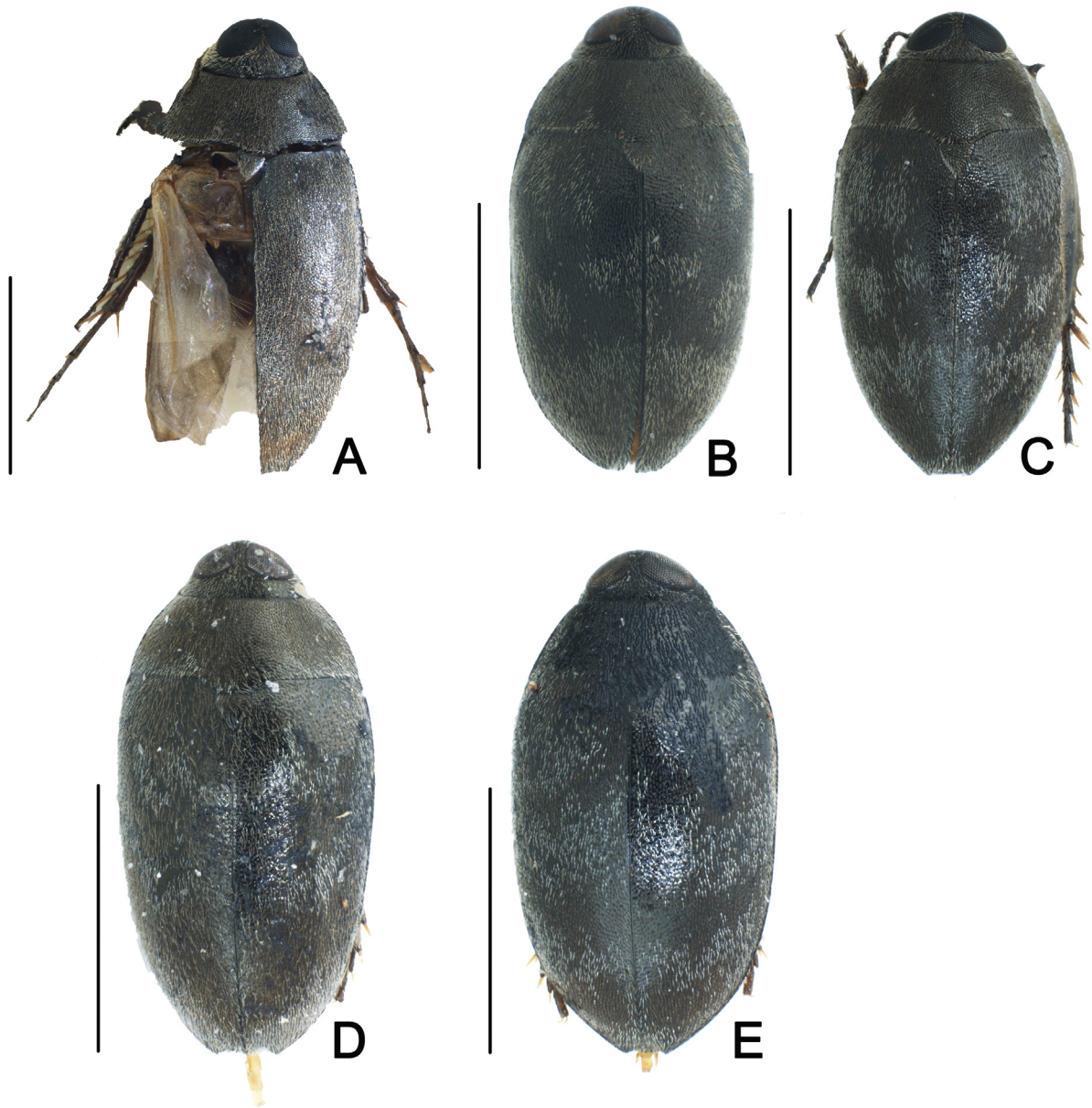

Fig. 9. *Pseudeucinetus* spp. **A**. *P. papuanus* sp. nov., holotype (BPBM). **B**. *P. uenoi* Spangler, 1995 (EUMJ). **C**. *P. javanicus* Yoshitomi & Putra, 2010, paratype (EUMJ). **D**. *P. solomonicus* Yoshitomi & Putra, 2010, paratype (EUMJ). **E**. *P. zygops* Heller, 1921 (EUMJ). Scale bars: 1.0 mm.

Aedeagus (Fig. 10C–D). Long, well sclerotized; basal piece oblong, subparallel-sided; lateral lobes long, about 1.4 times as long as basal piece, straight on lateral margins, with a pair of obtuse subapical inner projections on apical fifth; median lobe long, about 0.9 times as long as lateral lobes, nipple-like at apex; ML/BL 1.29; ML/LL 0.89.

Female

Unknown.

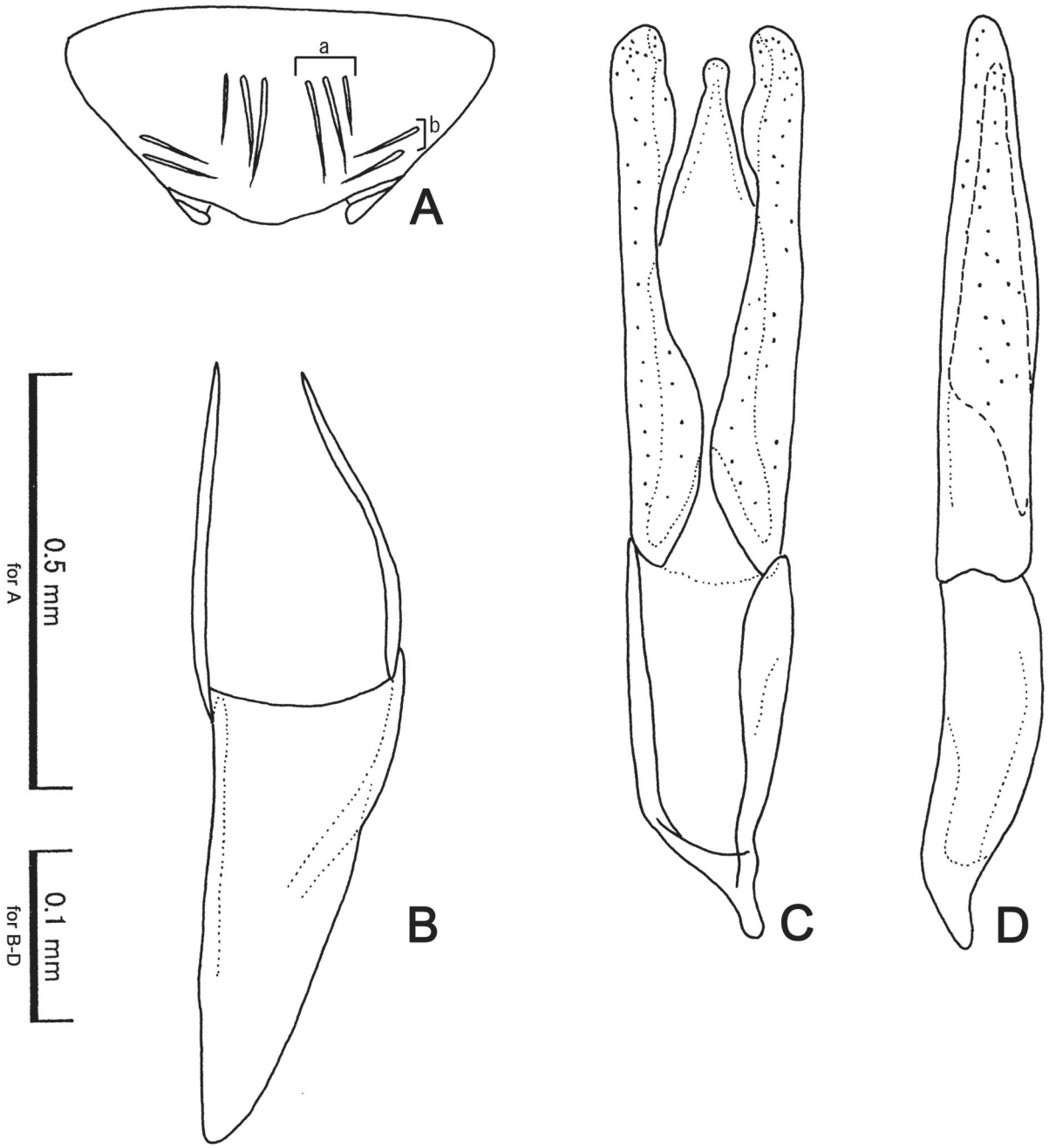

Fig. 10. *Pseudeucinetus papuanus* sp. nov., male genitalia, holotype, BPBM. **A**. Sternite VII. **B**. Sternite IX. **C**. Aedeagus, ventral view. **D**. Aedeagus, right lateral view.

Measurements

Male (n = 1): TL 2.15 mm; PW 1.00 mm; PL 0.43 mm; EL 1.72 mm; EW 1.20 mm.

Distribution

Papua New Guinea.

Remarks

This species is related to *Pseudeucinetus novabritannica* from the Bismarck Archipelago and *P. solomonicus* from the Solomon Islands, and differs from them in the following characteristics: 1) subapical inner projection of lateral lobe obvious (large and distinct in *P. solomonicus*); 2) subbasal inner projection of lateral lobe absent (present in *P. novabritannica*); and 3) basal piece long, about 0.7 times as long as lateral lobe (about 0.5 in *P. novabritannica*, about 0.8 in *P. solomonicus*).

Pseudeucinetus javanicus Yoshitomi & Putra, 2010
Figs 4A, D, 9C

Pseudeucinetus javanicus Yoshitomi & Putra, 2010: 144.

Material examined

INDONESIA • 1 ♂; "INDONESIA: Lombok I: Aik Bukak 2. VII. 1978"; "J. T. Medler Coll. BISHOP Museum Acc. #1979. 483"; BPBM.

Distribution

Indonesia (Java, Lombok).

Remarks

This is the first record of this species from Lombok Island.

Pseudeucinetus zygops Heller, 1921
Fig. 9E

Pseudeucinetus zygops Heller, 1921: 156.
Thaumastodus fusiformis Champion, 1924a: 27 (synonymized by Champion 1924b).

Pseudeucinetus zygops – Satô 1994: 173. — Spangler 1995: 401. — Yoshitomi 2004: 420.

Material examined

INDONESIA • 1 ♂; "INDONESIA Southwest Sulawesi Aele 6–8. II. 2003 (LT) S. Hori leg."; EUMJ.

MALAYSIA • 1 ♂; "MALAYA Selangor Connaught Bridge 14. III. 1958"; "T. C. Maa Collector BISHOP 108"; BPBM.

PHILIPPINES • 2 ♂♂, 2 ♀♀; "[PALAWAN] Olanguan (0m) 76km N. of Puerto Pron-cesa 31. VIII. 1985 M. Sakai leg."; "attracted to mercury lamp"; EUMJ • 3 ♂♂; same collection data as for preceding but "26. VIII. 1985"; EUMJ • 1 ♀; "[PALAWAN] Trident Mine, 500m foot of Victoria Peak nr. Narra 4. IX. 1985 M. Sakai"; EUMJ • 1 ♂; same collection data as for preceding but "5. IX. 1985"; EUMJ • 1 ♂; "[PALAWAN] Olanguan (0–50m) between Puerto Princesa & Roxas 1. IX. 1985 M. Sakai"; EUMJ.

Distribution

India, Indonesia (Sulawesi), Malaysian Peninsula, Bismarck Archipelago (New Ireland), the Philippines (Balabac, Palawan, Mindanao, Negros).

Pseudeucinetus uenoi Spangler, 1995
Fig. 9B

Pseudeucinetus uenoi Spangler, 1995: 396.

Material examined

MALAYSIA • 1 ♂; "Miri Sarawak 11-XII-1968 M. Satô leg."; EUMJ • 1 ♂; "MALAYSIA Mamut Ranau Sabah 27. Ii. 1995 [L. T.] YR. SAWADA leg."; EUMJ • 1 ♂; "Malaysia SABAH Kg. Sukau, Sandakan 15-16. XII. 2009 H. Takizawa"; ITBC • 1 ♀; "Malaysia SABAH Kg. Tikolod, Salt trail Tambunan 11. XI. 2009 H. Takizawa"; ITBC • 1 ♀; "Malaysia SABAH Kg. Mansiang, Mengg-atal, Kota Kinabalu 21. XI. 2009 H. Takizawa"; ITBC.

Distribution

Malaysia (Sarawak, Sabah).

Pseudeucinetus sp.

Material examined

INDONESIA • 1 ♀; "IRIAN JAYA East of Serui Yapen Is. 28. VII. 1996 N. Ohbayashi"; EUMJ.

BRAZIL • 1 ♀; "BRAZIL: Cabo Frio 1m 20–21. XI. 1970"; "T. C. Maa Collector BISHOP"; BPBM.

Remarks

The single female specimen labelled as having been collected in Brazil is questionable, because this genus is otherwise known only from the Oriental Region.

Genus ***Mexico*** Spilman, 1972

Mexico Spilman, 1972: 113 (type species: *Mexico litoralis* Spilman, 1972, by original designation).
Babalimnichus Satô, 1994: 174 (type species: *Babalimnichus taiwanus* Satô, 1994: 174, by original designation). **Syn. nov.**

Mexico – Skelley 2005: 119.
Babalimnichus – Yoshitomi & Satô 2001: 472 [larval description].

Diagnosis

Body oblong. Gena relatively narrow; shallow antennal groove present. Antennae stout and short, 11-segmented; antennal insertions situated near mandibles. Legs relatively short and stout; tarsal formula 4-4-4.

Remarks

As already mentioned by Skelley (2005), *Babalimnichus* Satô, 1994 cannot be separated from *Mexico*, and it should be treated as a junior synonym of the latter.

The male genital structures are very peculiar, i.e., with very short lateral lobes with apical setae, longer median lobe and the presence of ventral plates (Fig. 1A).

Biological notes

The habitat of this genus (Fig. 4B–C) is rocky seashores. The adults (Fig. 4E) are found in the splash zone of wet rocks, actively flying when disturbed. The larval stage was described by Yoshitomi & Satô (2001).

Key to the males of the species of Asian *Mexico**

1. Lateral lobes long, exceeding proximal half of median lobe, with very short apical setae; Papua New Guinea ..... ***M. papuanus*** sp. nov.
– Lateral lobes short, reaching about proximal third of median lobe, with long apical setae 2

2. Ventral plates almost of same proportion on right and left 4
– Apical part of left ventral plates distinctly curved interiorly 3

3. Left ventral plates with thumb-like projection on inner margin of apex; median lobe rather slender; Taiwan and Japan, Yonaguni-jima ..... ***M. taiwanus*** Satô, 1994 comb. nov.
– Left ventral plates long and curved interiorly in apical part, without thumb-like projection; median lobe wide, expanded in apical quarter; Japan, Honshu to Ishigaki-jima ..... ***M. masamii*** (Satô, 1994) comb. nov.

4. Apical part of ventral plates separated from median lobe; Palau ..... ***M. palauensis*** sp. nov.
– Apical part of ventral plates connected with median lobe 5

5. Apex of median lobe nipple-like; Borneo ..... ***M. borneensis*** sp. nov.
– Apex of median lobe simply pointed 6

6. Lateral lobe robust, with 2–3 apical setae; Bali ..... ***M. baliensis*** sp. nov.
– Lateral lobe slender, with 4 apical setae; Ogasawara Islands ..... ***M. ogasawaraensis*** sp. nov.

* *Mexico splendens* (Hernando & Ribera, 2003) comb. nov. is omitted, because this species is only known from a female specimen.

Mexico ogasawaraensis sp. nov.
urn:lsid:zoobank.org:act:8B1989C3-5D1B-4E9C-A87F-0ED19524F6D4
Figs 4C, 11C, 12

Etymology

This species is named after its type locality.

Material examined

Holotype

JAPAN • ♂; "[OG2] Meijima, Hahajima-guntô, Ogasawara Isls., Japan, 26°567418″ N, 142°227674″ E, 23. IX. 2012, H. Yoshitomi leg."; EUMJ.

Paratypes

JAPAN • 4 ♂♂, 2 ex.; same collection data as for holotype; EUMJ • 1 ♂, 1 ♀; same collection data as for preceding; NSMT • 1 ♂, 1 ♀; same collection data as for preceding; NMW • 1 ♀; "[OG5] Minamizaki, Hahajima, Ogasawara Isls., Japan, 26°37.491″ N, 142°10.600″ E, 25. IX. 2012, H. Yoshitomi leg.";

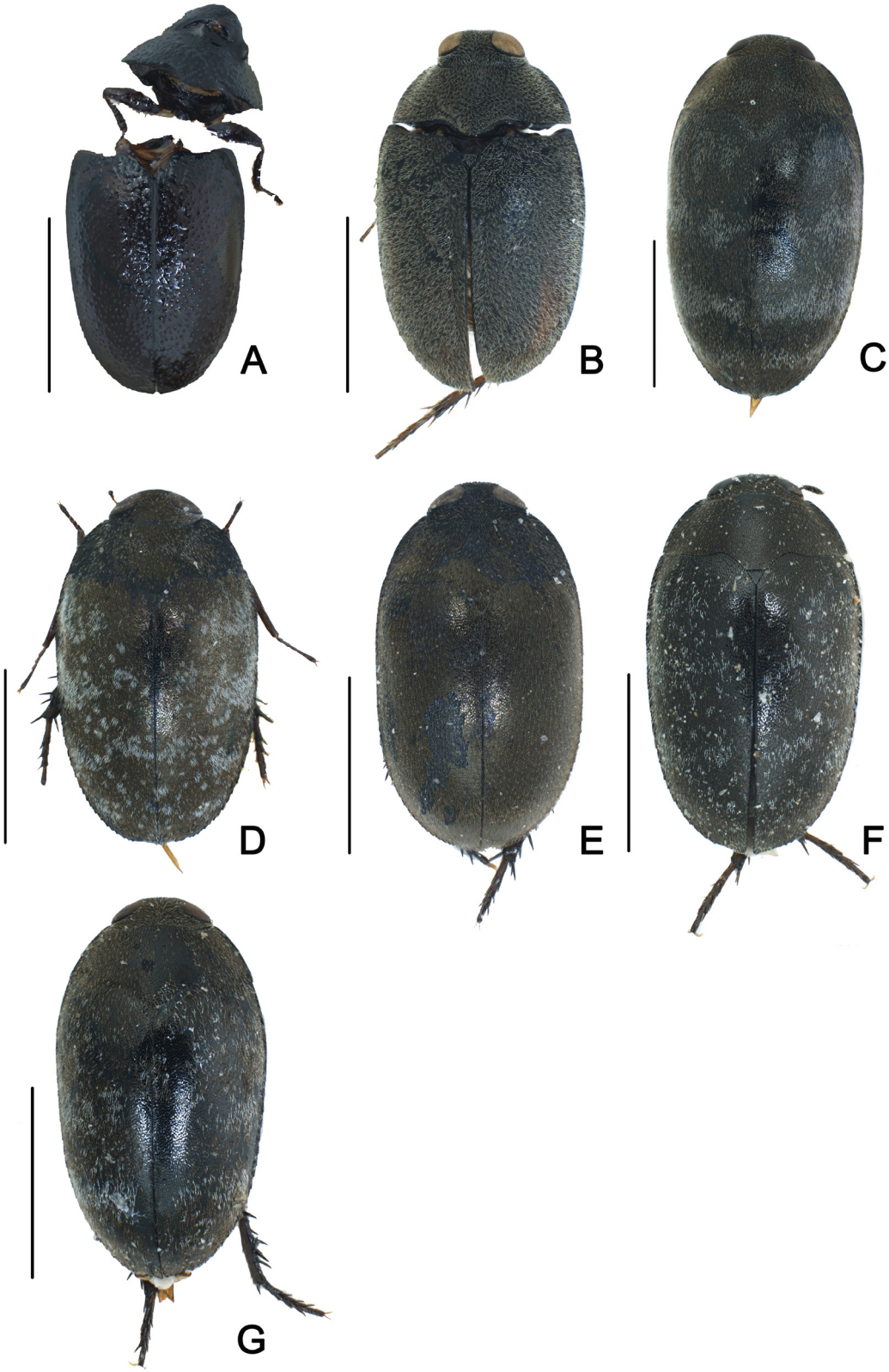

Fig. 11. Species of *Mexico* Spilman, 1972. **A**. *M. borneensis* sp. nov., holotype (BPBM). **B**. *M. papuanus* sp. nov., holotype (BPBM). **C**. *M. ogasawaraensis* sp. nov., holotype (EUMJ). **D**. *M. baliensis* sp. nov., holotype (EUMJ). **E**. *M. palauensis* sp. nov., holotype (EUMJ). **F**. *M. masamii* (Satô, 1994) (EUMJ). **G**. *M. taiwanus* (Satô, 1994), paratype (EUMJ). Scale bars: 1.0 mm.

EUMJ • 4 ♂♂, 2 ex.; "[OG4] Hirashima, Hahajima-guntô, Ogasawara Isls., Japan, 26°35.169″ N, 142°09.177″ E, 24. IX. 2012, H. Yoshitomi leg."; EUMJ.

Description

Male

Body. Oval, slightly convex dorsally, shiny, closely covered with suberect golden setae. Coloration of body black; elytra with indistinct and irregular silver spots consisting of erect setae.

Head. Closely and finely punctate, slightly convex between eyes; distance between eyes as long as an eye diameter in dorsal view.

Antennae. Short, reaching about anterior third of pronotum.

Pronotum. Closely punctate, gently arcuate on lateral margins; PW/PL 1.92–2.30 (2.09). Scutellum equilateral triangular, punctate as in pronotum.

Elytra. Oval, widest at base, gently tapered posteriorly; caudal third of lateral margins slightly and indistinctly serrate; EL/EW 1.40–1.54 (1.48); EL/PL 3.25–4.00 (3.58); EW/PW 1.12–1.20 (1.16); TL/EW 1.80–1.96 (1.89).

Abdomen. Sternite VII (Fig. 12A) bearing about 40 long setae on mesal part, pointed at postero-lateral corners, slightly projecting on median part of caudal margin. Sternite VIII (Fig. 12B) slightly sclerotized, small, Y-shaped. Sternite IX (Fig. 12C) moderately sclerotized, relatively wide, strongly curved in basal part, with long and pointed apical plates.

Aedeagus (Fig. 12D–G). Long and slender, well sclerotized; basal piece oval; lateral lobes short and slender, with three apical setae; median lobe long and slender, slightly expanded in apical fifth, pointed at apex, finely punctuate; ventral plates slender, reaching about apical fifth of median lobe, mostly fused to median lobe; ML/BL 2.94; ML/LL 2.42.

Female

Sexual dimorphism slight. Sternite VII (Fig. 12H) bearing about 30 long setae on mesal part, pointed but minutely concaved at postero-lateral corners, slightly projecting on median part of caudal margin. Urosternite (Fig. 12I) well sclerotized, T-shaped, with long and slender apodeme. Ovipositor (Fig. 12J) well sclerotized; coxite sparsely punctuate; apex of baculus bifid; approximate ratio of coxite and baculus (n = 1) 1.0 : 6.1.

Measurements

Unsexed (n = 20): TL 2.10–2.65 (2.39) mm; PW 0.98–1.20 (1.09) mm; PL 0.45–0.60 (0.52) mm; EL 1.65–2.05 (1.86) mm; EW 1.10–1.40 (1.26) mm.

Distribution

Japan: Ogasawara Islands (Hahajima, Meijima, Hirashima).

Remarks

This species appears to be closely related to *M. baliensis* sp. nov. based on the shape of the aedeagus, but differs from it in the following characteristics: sternite IX broad (slender in *M. baliensis* sp. nov.), median lobe pointed at apex (somewhat obtuse in *M. baliensis* sp. nov.) and apical setae on lateral lobes long (short in *M. baliensis* sp. nov.).

Biological notes

The type series was collected from the splash zone of wet rocks on a rocky seashore (Fig. 4C).

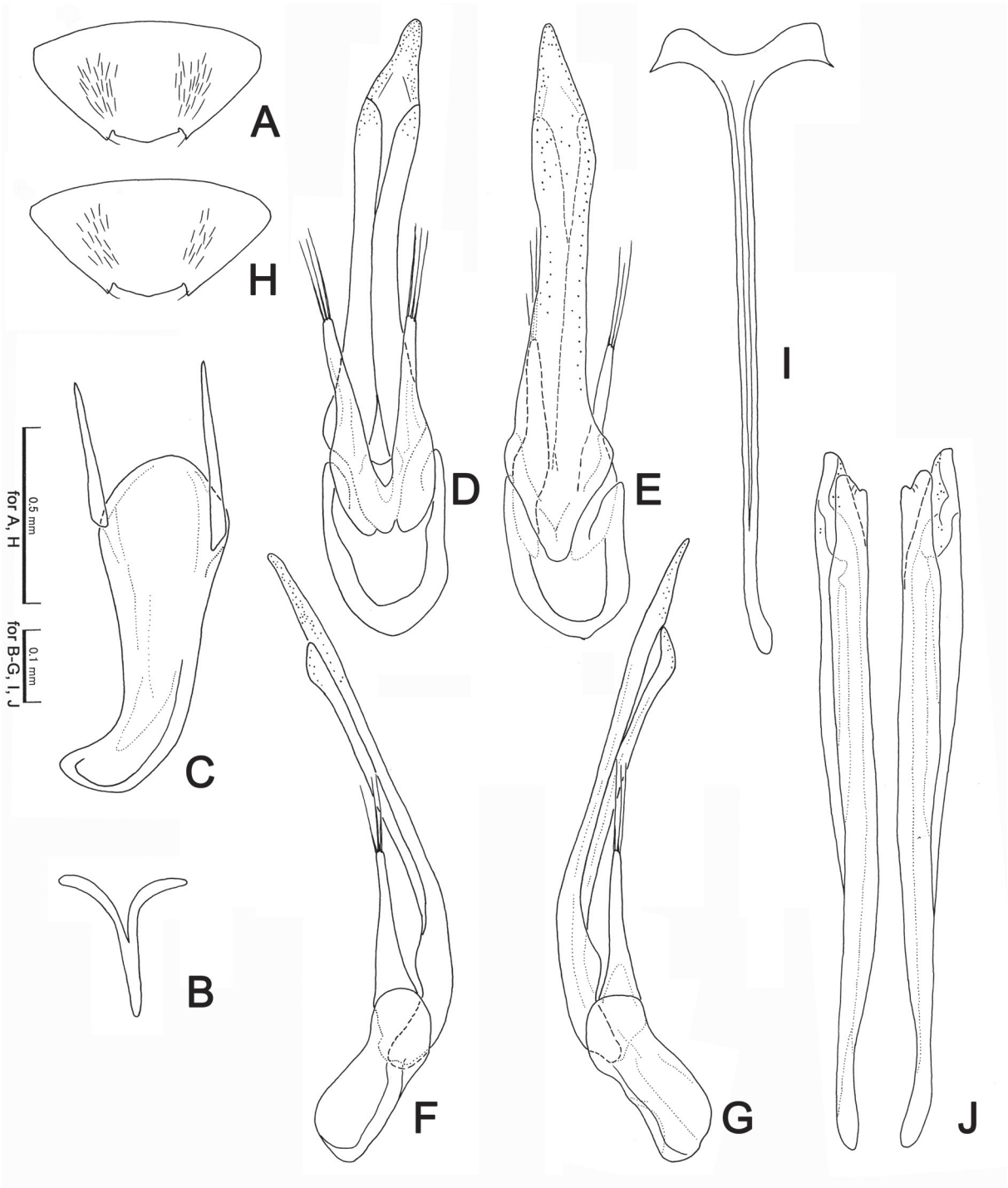

Fig. 12. *Mexico ogasawaraensis* sp. nov., male (A–G) and female (H–J) genitalia (paratypes, EUMJ). **A, H**. Sternite VII. **B**. Sternite VIII. **C**. Sternite IX. **D**. Aedeagus, ventral view. **E**. Aedeagus in dorsal view. **F**. Aedeagus in right lateral view. **G**. Aedeagus, left lateral view. **I**. Urosternite. **J**. Ovipositor.

Mexico baliensis sp. nov.
urn:lsid:zoobank.org:act:98D64DE9-6A33-4EBF-A7F9-26F9A7BA409E
Figs 4B, 11D, 13

Etymology

This species is named after its type locality.

Material examined

Holotype

INDONESIA • ♂; "Bali Is. Indonesia Nusa Dua, Kuta South 16-II-2013 Kiyoshi ANDO leg."; EUMJ.

Paratypes

INDONESIA • 1 ♂, 3 ♀♀, 2 ex.; same collection data as for holotype; EUMJ • 3 ex.; "Nusa Dua, North Island 8°47′52.72″ S, 115°14′9.31″ E, Bali, INDONESIA 7–8. VIII. 2010 H. Yoshitomi leg."; EUMJ • 1 ex.; same collection data as for preceding; NMW • 1 ex.; same collection data as for preceding; BPBM • 4 ♂♂, 4 ♀♀, 13 ex.; "Nusa Dua, South Island 8°48′6.81″ S, 115°14′16.07″ E, Bali, INDONESIA 8. VIII. 2010 H. Yoshitomi leg."; 1 ♀ on slide no HY 1141; EUMJ • 3 ex.; same collection data as for preceding; NMW • 3 ex.; same collection data as for preceding; BPBM.

Description

Male

Body. Oval, slightly convex dorsally, shiny, closely covered with suberect golden setae. Coloration of body black; elytra with small, irregular silver spots consisting of erect setae.

Head. Finely punctate, projecting anteriorly between eyes; distance between eyes about 0.8 times as long as eye diameter in dorsal view.

Antennae. Very short, reaching about anterior quarter of pronotum.

Pronotum. Closely punctate, gently arcuate on lateral margins; PW/PL 1.75–2.55 (2.06). Scutellum square.

Elytra. Oval, widest at base, gently tapered posteriorly; caudal third of lateral margins serrate; EL/EW 1.32–1.43 (1.38); EL/PL 2.53–4.00 (3.25); EW/PW 1.09–1.20 (1.14); TL/EW 1.67–1.88 (1.81).

Abdomen. Sternite VII (Fig. 13A) with two pairs (inner and outer) of long and stout setae and two extra pairs of such setae, pointed at postero-lateral corners, slightly projecting on median part of caudal margin. Sternite VIII (Fig. 13B) slightly sclerotized, small, Y-shaped. Sternite IX (Fig. 13C) moderately sclerotized, slender, curved in basal part; apical plates long, truncate at apices.

Aedeagus (Fig. 13D–G). Long and slender; basal piece oval, subparallel-sided; lateral lobes short and robust, with 2–3 apical setae; median lobe long and slender, subparallel-sided near base to apex, finely punctuate, pointed at apex; ventral plates long and slender, reaching about apical tenth of median lobe, mostly fused to median lobe; ML/BL 2.26; ML/LL 2.72.

Female

Sexual dimorphism slight. Sternite VII (Fig. 13H) similar to that of male, but one pair, not two, of extra inner setae. Urosternite (Fig. 13I) well sclerotized, Y-shaped, with long and slender apodeme. Ovipositor (Fig. 13J) well sclerotized; coxite sparsely punctuate, rather pointed at apices; apex of baculus bifid; approximate ratio of coxite and baculus (n = 1) 1.0 : 6.2.

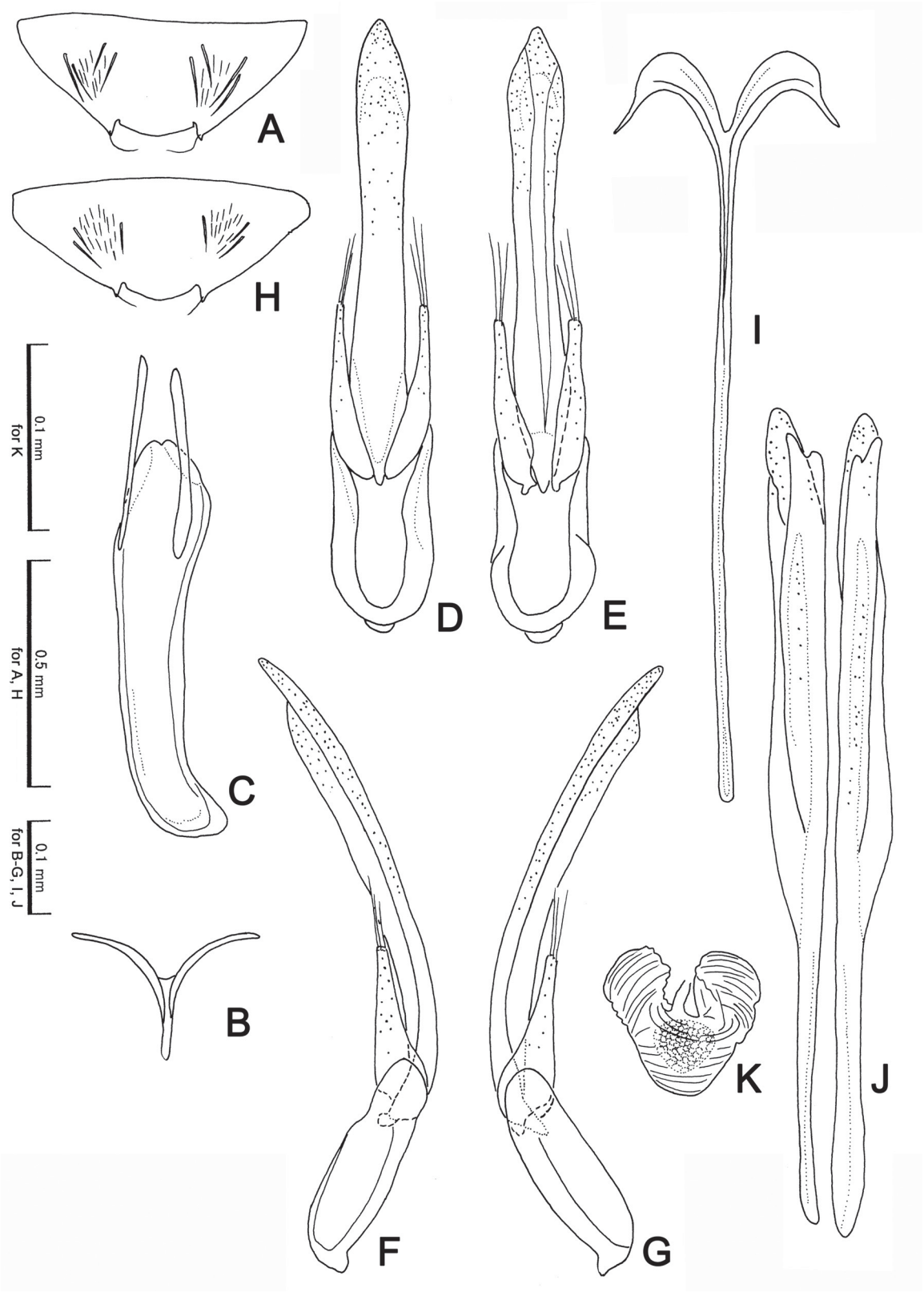

Fig. 13. *Mexico baliensis* sp. nov., male (A–G) and female (H–K) genitalia (paratypes, EUMJ). **A, H**. Sternite VII. **B**. Sternite VIII. **C**. Sternite IX. **D**. Aedeagus in dorsal view. **E**. Aedeagus, ventral view. **F**. Aedeagus in right lateral view. **G**. Aedeagus, left lateral view. **I**. Urosternite. **J**. Ovipositor. **K**. Spermatheca.

Measurements

Unsexed (n = 20): TL 1.88–2.40 (2.19) mm; PW 0.95–1.13 (1.06) mm; PL 0.40–0.60 (0.52) mm; EL 1.48–1.80 (1.67) mm; EW 1.05–1.30 (1.21) mm.

Distribution

Indonesia (Bali Island).

Remarks

This species is similar to *M. borneensis* sp. nov. in the shape of the aedeagus, but differs from it in the following characteristics: median lobe obtuse at apex (pointed in *M. borneensis* sp. nov.); and apical setae on lateral lobes relatively short (long in *M. borneensis* sp. nov.).

Biological notes

The type series was collected from the surface of wet rocks on a seashore (Fig. 4B) together with three species of *Laius* Guérin-Méneville, 1830 (Melyridae: *L. baliensis* Yoshitomi, 2014, *L. satoi* Yoshitomi, 2008 and *L. pankowi* Wittmer, 1999) and *Parathroscinus* sp. (Limnichidae) (Yoshitomi 2008, 2014b).

Mexico papuanus sp. nov.

urn:lsid:zoobank.org:act:DB69DE47-18E6-4FA0-8D94-A9A95470D78E

Figs 11B, 14

Etymology

This species is named after its type locality.

Material examined

Holotype

PAPUA NEW GUINEA • ♂; "NEW GUINEA (NE) Dreikikir, Sepik Distr., 350m 25. VI. 1961"; "J. L. & M. Gressitt Collectors"; BPBM.

Paratypes

PAPUA NEW GUINEA • 1 ♂, 1 ♀; same collection data as for holotype; BPBM • 1 ♀; same collection data as for holotype but "23. VI. 1961"; BPBM • 1 ♀; same collection data as for holotype but "24. VI. 1961"; BPBM • 1 ♀; "NEW GUINEA: NETH. VOG ELKOP: Bomberi 700–900m, VI-9-'59"; "J. L. Gressitt Collector"; BPBM • 1 ♂; "NE New Guinea Morabe Distr. 10km W Bulolo 780m, 5–25. VIII, 1967"; "Malaise tr. over stream"; "R. Straatman Collector BISHOP MUS."; BPBM • 1 ♂; "NE NEW GUINEA Akivitana Riv. 1550m, 10. I. 65"; "J. & M. Sedlacek Collectors BISHOP MUSEUM"; BPBM • 1 ♂; "NEW GUINEA: NETH. Waris, S. of Hollandia, 450–500m VIII-1-2-1959"; "At Light"; "T. C. Maa Collector BISHOP"; BPBM.

Description

Male

Body. Oval, relatively flat dorsally, shiny, closely covered with suberect golden setae. Coloration of body black; antennae and legs dark brown; elytra with indistinct and irregular silver spots consisting of erect setae.

Head. Finely punctate, shallowly depressed on dorsum between eyes; distance between eyes as long as eye diameter in dorsal view.

Antennae. Slender and short, reaching about anterior third of pronotum.

Pronotum. Closely and rugosely punctate, with lateral margins almost straight; PW / PL 2.51–2.71 (2.61). Scutellum small, square.

Elytra. Oval, widest at base, gently tapered posteriorly; caudal quarter of lateral margins slightly and minutely serrate; EL / EW 1.35–1.40 (1.38); EL / PL 3.77–4.00 (3.88); EW / PW 1.05–1.11 (1.08); TL / EW 1.71–1.75 (1.73).

Abdomen. Sternite VII (Fig. 14A) with two (inner and outer) pairs of long and slender setae and two extra setae, pointed in postero-lateral corners, gently projecting triangularly on mesal part of caudal margin. Sternite VIII (Fig. 14B) small, slightly sclerotized, Y-shaped. Sternite IX (Fig. 14C) wide, gently curved in basal part; apical plates long and slender, pointed at apices.

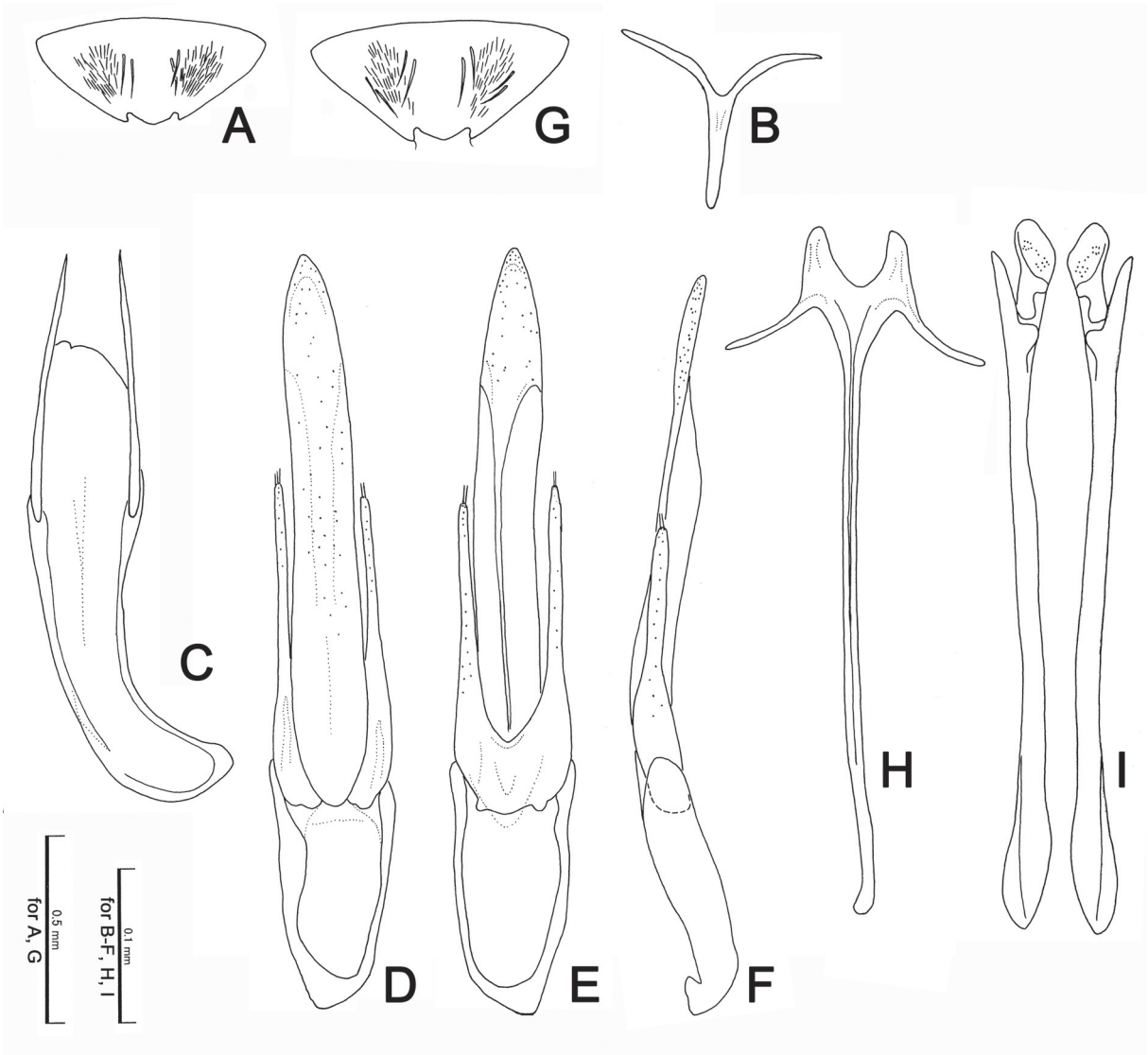

Fig. 14. *Mexico papuanus* sp. nov., male (A–F) and female (G–I) genitalia (holotype and paratype, BPBM). **A, G**. Sternite VII. **B**. Sternite VIII. **C**. Sternite IX. **D**. Aedeagus in dorsal view. **E**. Aedeagus, ventral view. **F**. Aedeagus, left lateral view. **H**. Urosternite. **I**. Ovipositor.

Aedeagus (Fig. 14D–F). Long, almost symmetrical; basal piece oval; lateral lobes short, with 4 short apical setae; median lobe slender, sparsely punctuate in apical part, slightly expanded in apical quarters, pointed and somewhat prolonged at apex; ventral plates slender, expanded apically, separated to median lobe; ML / BL 2.35; ML / LL 2.61.

Female

Sexual dimorphism slight. PW / PL 2.38–2.45 (2.42); EL / EW 1.36–1.42 (1.40); EL / PL 3.70–4.11 (3.85); EW / PW 1.07–1.18 (1.14); TL / EW 1.73–1.79 (1.76). Sternite VII (Fig. 14G) similar to that of male, but postero-lateral corners shallowly concave at apices. Urosternite (Fig. 14H) well sclerotized, Y-shaped, with long and slender apodeme. Ovipositor (Fig. 14I) well sclerotized; coxite sparsely punctuate, rather pointed at apices; apex of baculus bifid; approximate ratio of coxite and baculus (n = 1) 1.0 : 5.6.

Measurements

Male (n = 2): TL 1.75–2.05 (1.90) mm; PW 0.95–1.08 (1.02) mm; PL 0.35–0.43 (0.39) mm; EL 1.40–1.62 (1.51) mm; EW 1.00–1.20 (1.10) mm. Female (n = 3): TL 1.88–2.30 (2.03) mm; PW 0.95–1.10 (1.01) mm; PL 0.40–0.45 (0.42) mm; EL 1.48–1.85 (1.61) mm; EW 1.05–1.30 (1.15) mm.

Distribution

Papua New Guinea.

Remarks

This species is distinct in the peculiar form of the male genitalia.

Mexico palauensis sp. nov.

urn:lsid:zoobank.org:act:9A734C2D-BF7A-4F05-8628-36655720A091

Figs 11E, 15

Etymology

This species is named after its type locality.

Material examined

Holotype

PALAU • ♂; "Carp Is. Palau 13–15. IX. 2002 M. Sato leg."; EUMJ.

Paratypes

PALAU • 49 ex.; same collection data as for holotype; EUMJ • 4 ex.; same collection data as for preceding; NMW • 4 ex.; same collection data as for preceding; BPBM • 1 ♀, 2 ex.; "Carp Is. Palau 20-VII-2003 K. Takahashi leg."; EUMJ • 1 ♂, 4 ex.; "Palau Angaur Is. 16-VIII-2003, M. Sato leg."; EUMJ • 1 ♂, 6 ex.; "Palau Peleliu Is. 13–17. VIII. 2003 M. Sato leg."; 1 ♂ on slide no. HY 1038; EUMJ.

Description

Male

Body. Oval, slightly convex dorsally, shiny, closely covered with suberect golden setae. Coloration of body black; elytral silver spots indistinct.

Head. Finely punctate, slightly convex on dorsum between eyes; distance between eyes about 0.8 times as long as eye diameter in dorsal view.

Antennae. Very short, reaching about anterior quarter of pronotum.

Pronotum. Closely punctate, gently arcuate on lateral margins; PW/PL 1.96–2.80 (2.22). Scutellum small, square.

Elytra. Oval, widest at base, gently tapered posteriorly; caudal third of lateral margins slightly and indistinctly serrate; EL/EW 0.42–1.43 (1.30); EL/PL 1.13–4.13 (3.14); EW/PW 1.05–1.16 (1.09); TL/EW 0.79–1.87 (1.72).

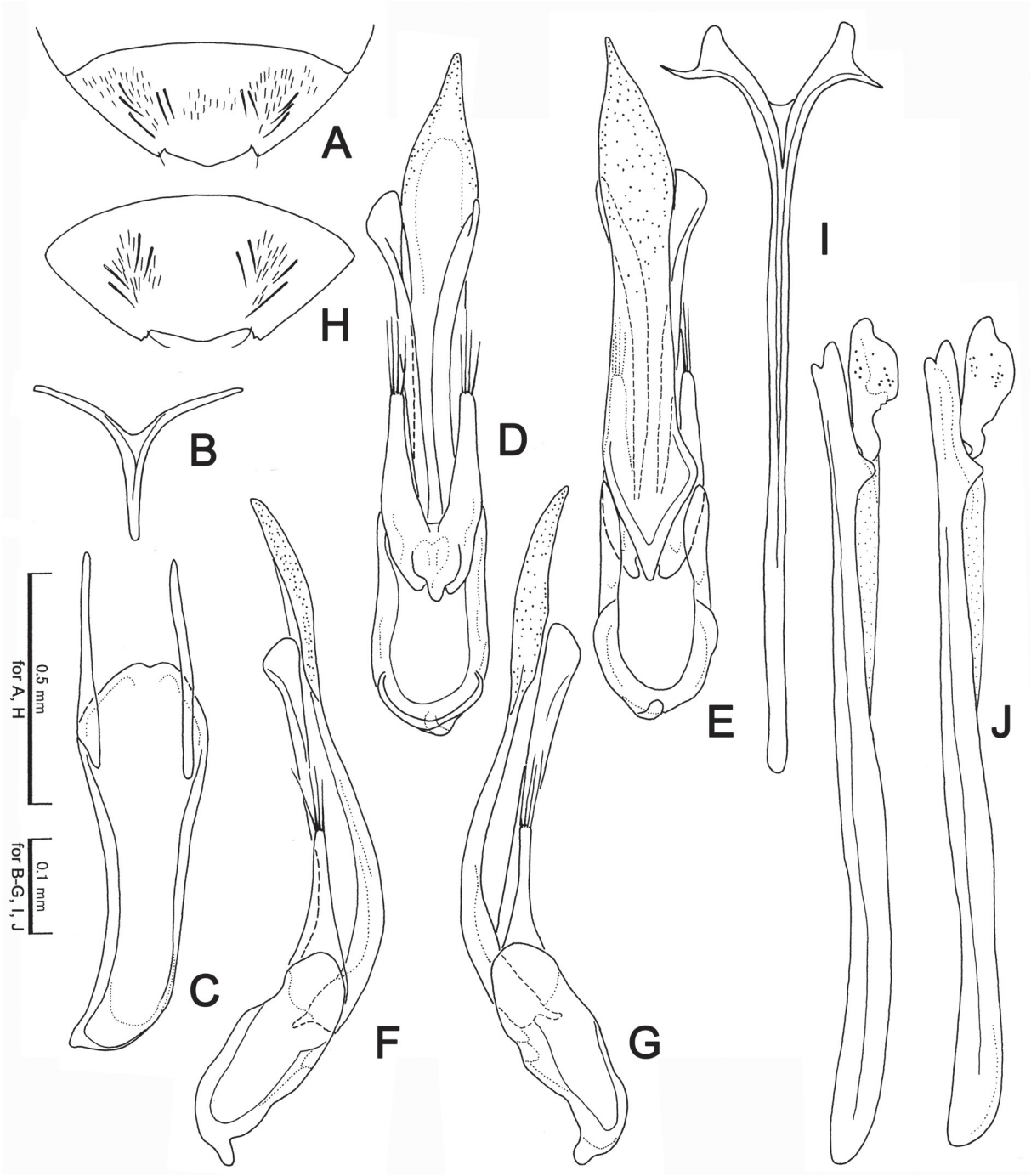

Fig. 15. *Mexico palauensis* sp. nov., male (A–G) and female (H–J) genitalia (paratypes, EUMJ). **A, H**. Sternite VII. **B**. Sternite VIII. **C**. Sternite IX. **D**. Aedeagus, ventral view. **E**. Aedeagus in dorsal view. **F**. Aedeagus in right lateral view. **G**. Aedeagus, left lateral view. **I**. Urosternite. **J**. Ovipositor.

Abdomen. Sternite VII (Fig. 15A) with two pairs of long and stout extra setae, bearing about 50 long setae, obtuse at postero-lateral corners, pentagonally projecting in median part of caudal margin. Sternite VIII (Fig. 15B) slightly sclerotized, small, Y-shaped. Sternite IX (Fig. 15C) well sclerotized, curved in basal part; apical plates long, pointed at apices.

Aedeagus (Fig. 15D–G). Long and slender, almost symmetrical; basal piece oval, gently tapering basally; lateral lobes relatively long and slender, with 2–3 very short apical setae, sparsely punctuate; median lobe long, subparallel-sided near base to apical fifth, sparsely punctuate, pointed at apex; ventral plates long and slender, reaching about apical fifth of median lobe, mostly fused to median lobe; ML / BL 2.06; ML / LL 1.92.

Female

Sexual dimorphism slight. Sternite VII (Fig. 15H) similar to that of male. Urosternite (Fig. 15I) well sclerotized, with long and slender apodeme, with slender lateral projections. Ovipositor (Fig. 15J) well sclerotized; coxite punctuate, obtuse at apices; apex of baculus pointed; approximate ratio of coxite and baculus (n = 1) 1.0 : 6.8.

Measurements

Unsexed (n = 20): TL 0.85–2.23 (1.93) mm; PW 0.82–1.12 (1.03) mm; PL 0.35–0.55 (0.47) mm; EL 0.45–1.68 (1.46) mm; EW 0.95–1.20 (1.12) mm.

Distribution

Palau (Carp, Peleliu Islands).

Remarks

This species is similar to *M. borneensis* sp. nov. in the shape of the aedeagus, but differs from it in the following characteristics: ventral plates separated from median lobe (attached in *M. borneensis* sp. nov.) and apical setae on lateral lobes short (long in *M. borneensis* sp. nov.).

Mexico borneensis sp. nov.

urn:lsid:zoobank.org:act:C119FDE3-9A59-4A07-A77A-AF4C067C5D1B

Figs 11A, 16

Etymology

This species is named after its type locality.

Material examined

Holotype

MALAYSIA • ♂; "BRITISH N BORNEO Labuan Island Nov. 28–29, 1958"; "Intertidal Zone"; "L. W. Quate Collector"; BPBM.

Paratypes

MALAYSIA • 1 ♀; same collection data as for holotype; BPBM • 1 ♂, 1 ex.; "BRITISH N BORNEO Labuan Island Nov. 28–29, 1959"; "Intertidal Zone"; "Maa Collector"; BPBM.

Description

Male

Body. Oval, slightly convex dorsally, shiny, closely covered with suberect golden setae. Coloration of body black; elytra with small, irregular silver spots consisting of erect setae.

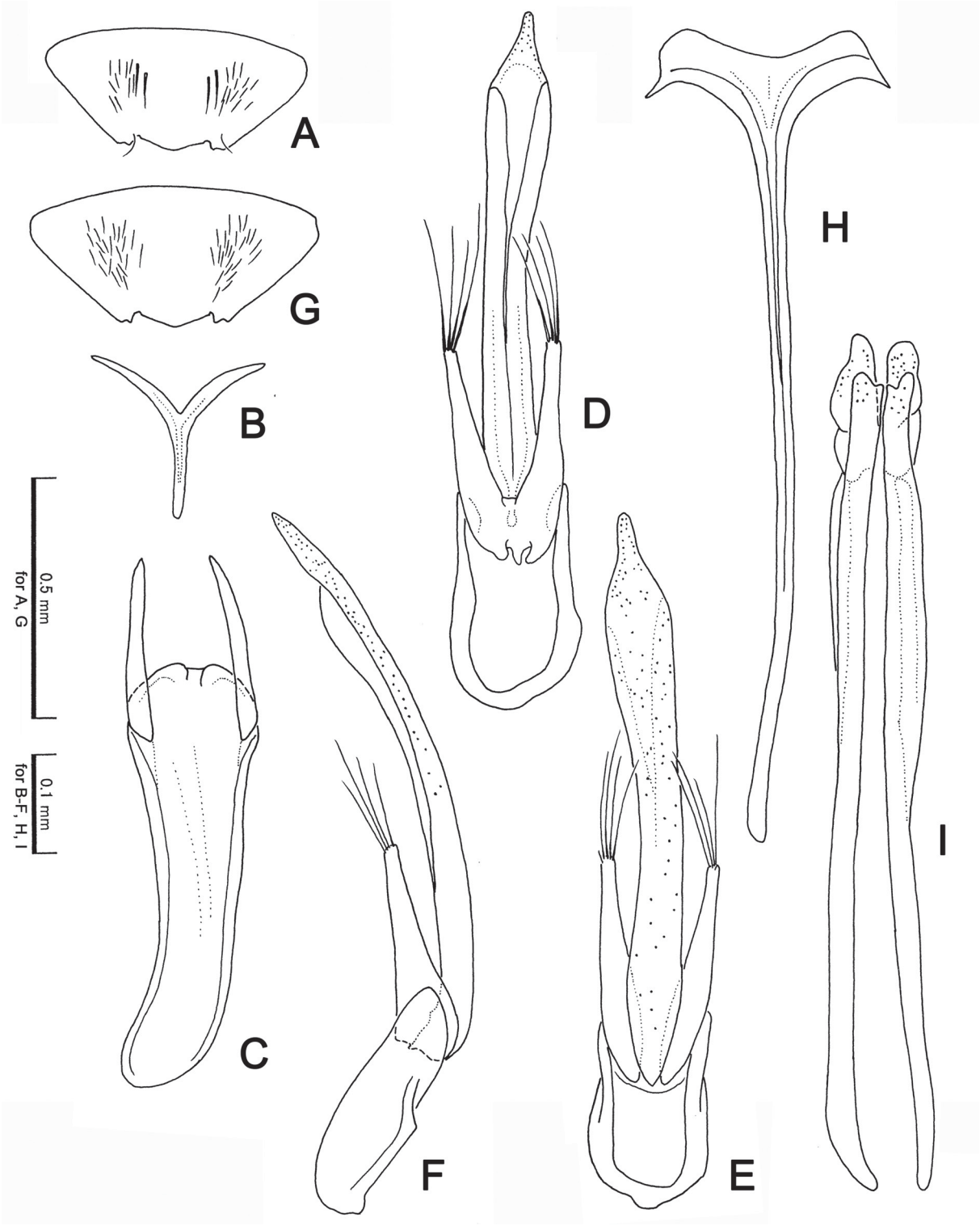

Fig. 16. *Mexico borneensis* sp. nov., male (A–F) and female (G–I) genitalia (holotype and paratype, BPBM). **A, G**. Sternite VII. **B**. Sternite VIII. **C**. Sternite IX. **D**. Aedeagus, ventral view. **E**. Aedeagus in dorsal view. **F**. Aedeagus in right lateral view. **H**. Urosternite. **I**. Ovipositor.

Head. Finely punctate, slightly convex on dorsum between eyes; distance between eyes about 0.8 times as long as eye diameter in dorsal view.

Antennae. Short, reaching about anterior third of pronotum.

Pronotum. Closely punctate; lateral margins gently arcuate; PW/PL 2.04–2.30 (2.20). Scutellum small, square.

Elytra. Oval, widest at base, gently tapered posteriorly; caudal quarter of lateral margins slightly and minutely serrate; EL/EW 1.33–1.48 (1.38); EL/PL 3.11–3.70 (3.35); EW/PW 1.09–1.14 (1.11); TL/EW 1.73–1.88 (1.79).

Abdomen. Sternite VII (Fig. 16A) with two pairs of long and stout extra setae, bearing about 20 long setae, bifid in postero-lateral corners, gently projecting triangularly in median part of caudal margin. Sternite VIII (Fig. 16B) small, slightly sclerotized, Y-shaped. Sternite IX (Fig. 16C) well sclerotized, lightly curved in basal part; apical plates long and stout, pointed at apices.

Aedeagus (Fig. 16D–F). Long and slender, almost symmetrical; basal piece oval; lateral lobes short, with 4 apical setae; median lobe long and slender, subparallel-sided near base to near apex, finely punctuate, with nipple-like apex; ventral plates long and slender, reaching about apical tenth of median lobe, mostly fused to median lobe; ML/BL 2.36; ML/LL 2.57.

Female

Sexual dimorphism slight. Sternite VII (Fig. 16G) similar to that of male, but lacking extra setae. Urosternite (Fig. 16H) well sclerotized, T-shaped, with long and slender apodeme. Ovipositor (Fig. 16I) well sclerotized; coxite sparsely punctuate, obtuse at apices; apex of baculus bifid; approximate ratio of coxite and baculus (n = 1) 1.0 : 5.5.

Measurements

Unsexed (n = 3): TL 1.70–1.88 (1.81) mm; PW 0.90–0.92 (0.91) mm; PL 0.40–0.45 (0.42) mm; EL 1.30–1.48 (1.39) mm; EW 0.98–1.05 (1.01) mm.

Distribution

Malaysia (Labuan Island, off Borneo).

Remarks

This species is similar to *M. baliensis* sp. nov. in the shape of the aedeagus, but differs from it in the following characteristics: median lobe pointed at apex (obtuse in *M. baliensis* sp. nov.) and lateral lobes bearing 4 apical setae (3 in *M. baliensis* sp. nov.).

Mexico taiwanus (Satô, 1994) comb. nov.
Figs 11G, 17

Babalimnichus taiwanus Satô, 1994: 174.

Babalimnichus masamii – Yoshitomi & Arai 2004: 23.

Material examined

JAPAN • 17 ex.; "Hikawa-hama Yonaguni-jima OKINAWA 18. VI. 2001 Koji TOYODA leg."; EUMJ • 4 ex.; "Dannuhama Yonaguni-jima 26-VIII-1994 M. Sato leg."; EUMJ.

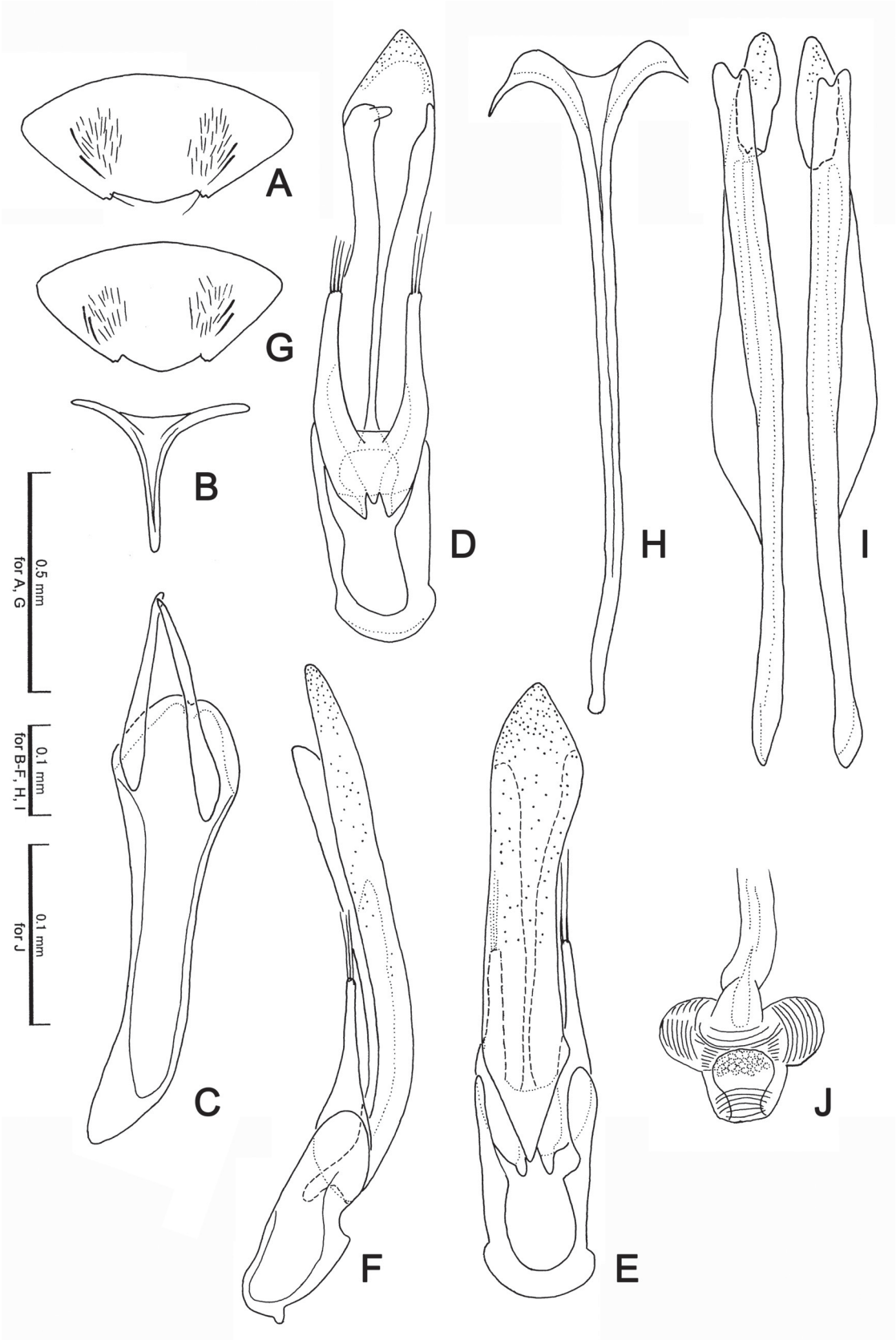

Fig. 17. *Mexico taiwanus* (Satô, 1994), male (A–F) and female (G–J) genitalia (EUMJ). **A, G**. Sternite VII. **B**. Sternite VIII. **C**. Sternite IX. **D**. Aedeagus, ventral view. **E**. Aedeagus in dorsal view. **F**. Aedeagus in right lateral view. **H**. Urosternite. **I**. Ovipositor. **J**. Spermatheca.

TAIWAN • 1 ♂, 1 ♀, 5 ex.; "Lung Keng Pintung Taiwan 10-VIII-2000 M. Sato leg."; EUMJ • 1 ex.; "Mao tantou Pintung, Taiwan 10-VIII-2000 M. Sato leg."; EUMJ • 1 ex.; "Lutao Taiwan 26-28. III. 1998 M. Sato leg."; EUMJ • 5 ex.; "Lanhsu Taiwan 5–10. VIII. 1998 M. Sato leg."; EUMJ • 3 ex., in ethanol; "Fushan Village Donghe Township, Taitung Country, Taiwan 1-V-2013 Tatsuya Niisato leg."; EUMJ.

Redescription

Male

For a detailed description of the external features, see the original description (Satô 1994). PW/PL 1.67–2.44 (2.00); EL/EW 1.18–1.42 (1.32); EL/PL 2.33–3.40 (2.87); EW/PW 1.00–1.15 (1.09); TL/EW 1.59–1.92 (1.78).

Sternite VII (Fig. 17A) with two pairs of long, stout extra setae, bearing about 20 long setae, bifid in postero-lateral corners, gently projecting triangularly in median part of caudal margin. Sternite VIII (Fig. 17B) small, slightly sclerotized, Y-shaped. Sternite IX (Fig. 17C) slender, lightly curved in basal part; apical plates long and slender, pointed at apices. Aedeagus (Fig. 17D–F) relatively short, asymmetrical; basal piece oval; lateral lobes short, with 2–4 apical setae; median lobe a little wide, sparsely punctuate in apical part, slightly expanded in apical quarter, pointed at apex; ventral plates relatively slender, separated from median lobe, left one with thumb-like projection on inner margin of apex; ML/BL 2.42; ML/LL 2.42.

Female

Sexual dimorphism slight. Sternite VII (Fig. 17G) similar to that of male. Urosternite (Fig. 17H) well sclerotized, with long and slender apodeme, T-shaped. Ovipositor (Fig. 17I) well sclerotized; coxite sparsely punctuate, rather pointed at apices; apices of baculus bifid; approximate ratio of coxite and baculus (n = 1) 1.0 : 5.3.

Measurements

Unsexed (n = 20): TL 1.68–2.17 (1.95) mm; PW 0.90–1.10 (1.01) mm; PL 0.40–0.60 (0.51) mm; EL 1.28–1.62 (1.44) mm; EW 1.00–1.15 (1.10) mm.

Distribution

Taiwan (including Lutao and Lanhsu Islands), Japan (Yonaguni-jima).

Remarks

This is the first record of this species from Lutao and Lanhsu Islands, off Taiwan, and Yonaguni-jima.

Mexico masamii (Satô, 1994) comb. nov.
Figs 11F, 18–19

Babalimnichus masamii Satô, 1994: 175.

Babalimnichus masamii – Yoshitomi & Satô 2001: 472 [larval description]. — Yoshitomi 2014a: 29. — Ono *et al.* 2012: 47. — Kamezawa 2017: 54.

Material examined

JAPAN • 7 ex.; "Japan: Honshû Nanaura-kaigan Tachibana, Sado-shi Niigata, 5. vi. 2016 37.986591, 138.234143 Kamezawa H. leg."; EUMJ • 1 ♂; "[IZ9] Ishijirogawa, Shikinejima, Izu Isls., Japan, 34°19.409″ N, 139°13.308″ E, ca 16 m, 7. II. 2013, H. Yoshitomi leg."; EUMJ • 1 ♂, 1 ♀, 14 ex.; "Kariya-kaigan Tokoname-shi Aichi Pref. 17. VIII. 1995, 17. VIII. 1995 H. Yoshitomi leg."; 1 ♂ and 1 ♀

on slides HY 989, 992–994; EUMJ • 1 ex.; “Zoubigasaki, Murozumi Hikari-shi Yamaguchi Pref., Jpn 28. VII. 2005 Y. Fujitani leg.”; EUMJ • 5 ex.; “Bashayamamura Amami-oshima 3-V-1999 M. Sato leg.”; EUMJ • 28 ex.; “Kawata Okinawa 5-V-1999 M. Sato leg.”; EUMJ • 9 ex.; “Kim-kaigan Okinawa 28-III-1997 M. Satô leg.”; EUMJ • 1 ex.; “Onnason Okinawa-jima 26-28. IV. 2004 M. Sato leg.”; EUMJ • 1 ex.; “Kume-jima Ryukyu 30-IV-2004 M. Sato leg.”; EUMJ • 2 ex.; “Tomori Ryukyus Miyako-jima

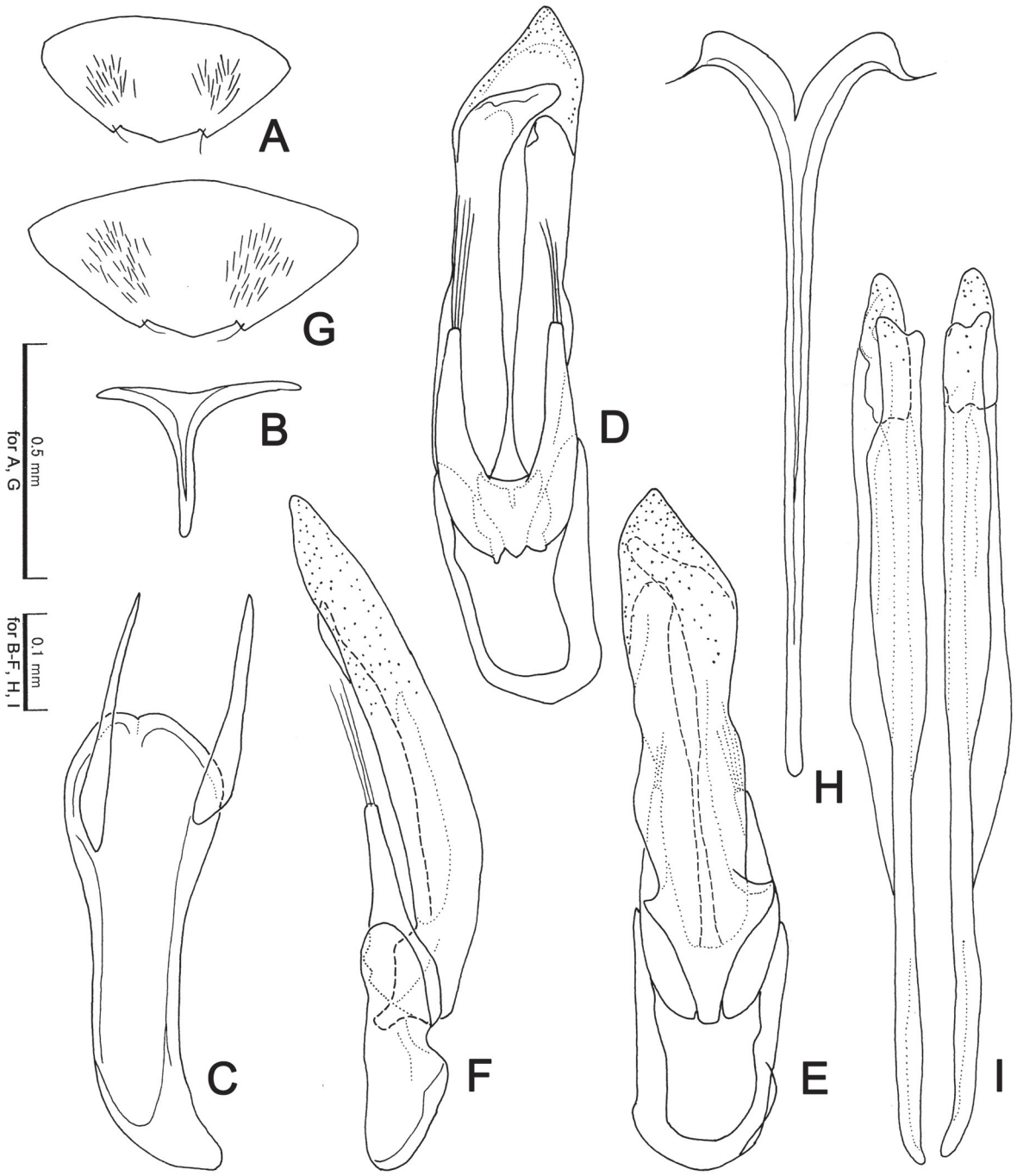

Fig. 18. *Mexico masamii* (Satô, 1994), male (A–F) and female (G–J) genitalia (EUMJ). **A, G**. Sternite VII. **B**. Sternite VIII. **C**. Sternite IX. **D**. Aedeagus, ventral view. **E**. Aedeagus in dorsal view. **F**. Aedeagus in right lateral view. **H**. Urosternite. **I**. Ovipositor.

7-V-1998 M. Satô leg."; EUMJ • 13 ex.; "Uganzaki Ishigaki 22-IX-2003 M. Sato leg."; EUMJ • 7 ex., in ethanol; "Sakaura, Izumo, Shimane 31. VII. 2006 M. Hayashi"; EUMJ • 2 pupae, with larval skins, in ethanol; "Nahama-kaigan, Nagai, Yokosuka-shi Kanagawa Pref., Japan 6. July 2007 M. Asano leg."; EUMJ.

Redescription

Male

For a detailed description of the external features, see the original description (Satô 1994). PW / PL 1.67–2.22 (1.99); EL / EW 1.27–1.48 (1.36); EL / PL 2.64–3.29 (2.96); EW / PW 1.00–1.18 (1.10); TL / EW 1.71–1.95 (1.82).

Sternite VII (Fig. 18A) bearing about 30 long setae, lacking extra setae; postero-lateral corners short and pointed; median part of caudal margin gently projecting triangularly. Sternite VIII (Fig. 18B) small, slightly sclerotized, Y-shaped. Sternite IX (Fig. 18C) well sclerotized, curved in basal part, shallowly concave at apex; apical plates rather stout, pointed at apices. Aedeagus (Fig. 18D–F) relatively short, asymmetrical; basal piece oval; lateral lobes short, with 3–4 apical setae; median lobe wide, sparsely punctuate in apical part, expanded in apical quarter, gently pointed at apex; ventral plates wide, separated from median lobe, left one long and curved interiorly in apical part, right one short and straight; ML / BL 2.24; ML / LL 2.43.

Female

Sexual dimorphism slight. Sternite VII (Fig. 18G) similar to that of male. Urosternite (Fig. 18H) well sclerotized, T-shaped, with long and slender apodeme. Ovipositor (Fig. 18I) well sclerotized; coxite sparsely punctuate, rather pointed at apices; apex of baculus bifid; approximate ratio of coxite and baculus (n = 1) 1.0 : 5.9.

Pupae

Body (Fig. 19) about 1.5 mm, cream-colored, bearing long setae on head, pronotum, elytra and abdomen.

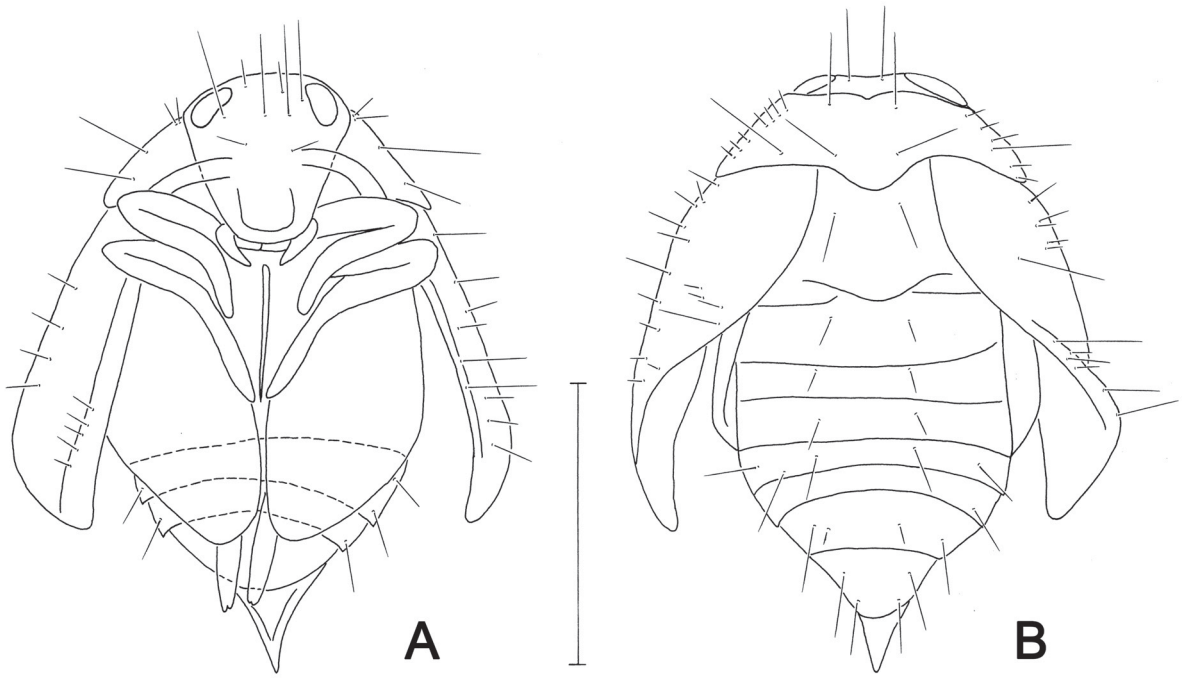

Fig. 19. Pupa of *Mexico masamii* (Satô, 1994). **A**. Ventral aspect. **B**. Dorsal aspect. Scale bar: 1.0 mm.

Measurements

Unsexed (n = 20): TL 1.82–2.32 (2.04) mm; PW 0.90–1.10 (1.02) mm; PL 0.45–0.60 (0.52) mm; EL 1.32–1.72 (1.53) mm; EW 1.00–1.30 (1.12) mm.

Distribution

Japan (Honshu, Sadogashima, Izu Islands (Shikine-jima, Kozu-shima), Shikoku, Kyushu, the Ryukyus (Yakushima, Amami-Ôshima, Tokuno-shima, Okinoerabu-jima, Yoron-tô, Okinawa-jima, Irabu-jima, Kume-jima, Miyako-jima, Ishigaki-jima)).

Remarks

I re-examined the specimens from Yonaguni-jima (Yoshitomi & Arai 2004), and it is clear that they do not represent this species but the preceding one. This is the first record of this species from Kume-jima.

This species has the northernmost distribution (Sado Island) in the subfamily Thaumastodinae (Kamezawa 2017).

Biological notes

Overwintering takes place in the larval stage in Chiba Prefecture (Ono *et al.* 2012) or the adult stage on the Izu Islands (Yoshitomi 2014a).

Mexico splendens (Hernando & Ribera, 2003) comb. nov.

Babalimnichus splendens Hernando & Ribera, 2003: 270.

Distribution

Tonga Islands.

Remarks

This species was described based on the female holotype. No additional specimens have been found.

Phylogeny

As a result of my analysis, one most parsimonious tree was obtained (L = 17, Ci = 88, Ri = 60), shown in Fig. 20. The synapomorphies of the subfamily Thaumastodinae are as follows: oblong body shape (1-1); eyes large, situated on dorso-lateral side of head (3-1); and hind legs with tibial spurs (9-1).

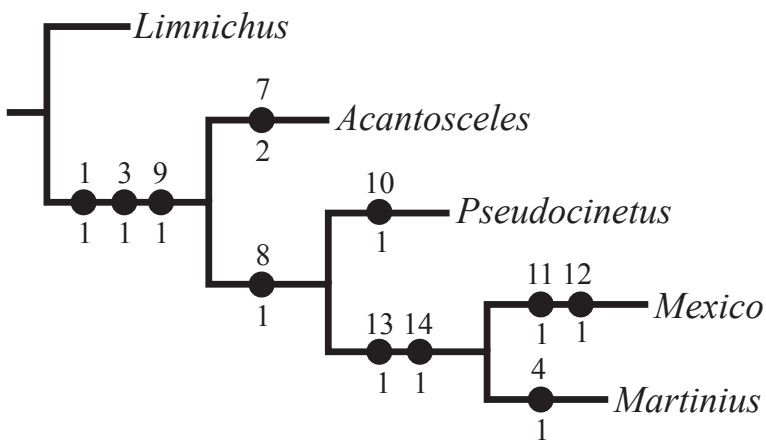

Fig. 20. Most parsimonious tree.

Discussion

In the present paper, I have reviewed the Asian species and genera of the subfamily Thaumastodinae, and recognized three genera and 25 species (adding seven new species) from this area.

Acontosceles is an Oriental genus, living in freshwater habitats. Some unnamed species were known (Pütz 2008) because the distributional area of each species is limited and some populations were represented by female specimens only. Some new species will be described in the near future.

Pseudeucinetus is also an Oriental genus, living in freshwater habitats. The adults of this genus are frequently attracted to light, and the distributional area of *P. zygops* is wide, from India to Indonesia.

Mexico is known as a Neotropical genus, and it is newly recorded from Asia in this study. The habitat of this genus is rocky seashores, and the distributional area is mainly the Oriental and the Neotropical, extending to the Palearctic (coastal area of Japan) and the Australian (Tonga Islands) Regions. The pattern is probably not a disjunct distribution, but rather a wide distribution in the Pacific. Undescribed species are expected to be found from unrecorded areas and countries, e.g., Indochina, the Philippines, many islands of Indonesia, Australia, New Caledonia and the Pacific Islands.

Martinius is a Neotropical genus, represented by three species. This genus shows a sister group relationship with the genus *Mexico* (Fig. 20).

Taking into consideration the factors mentioned above, Thaumastodinae does not seem to be an example of disjunct distribution. It is probable that the main distribution area of the subfamily is the Oriental Region, and it has spread to parts of the Pacific, the Palearctic, the Australian and the Neotropical areas.

In a preliminary phylogenetic analysis using morphological characters of nine genera in four subfamilies, the monophyly of the family Limnichidae was not supported (unpublished data). In addition, the monophyly of the subfamily Limnichinae, the most diverse subfamily within the family, was also doubtful as already mentioned by Hernando & Ribera (2005a). This subfamily is subdivided into three tribes, Bothriophorini, Limnichini and Wooldridgeni, and one genus group (*Mandersia* group, sensu Hernando & Ribera 2005b) in Limnichini. Most of the genera in the subfamily Limnichinae are classified in the tribe Limnichini without a tribal definition. It is suggested that the family Limnichidae is a paraphyletic group, and the definition of the family must be reconstructed, including related families such as Heteroceridae (Crowson, 1978), Chelonariidae (Kundrata *et al.* 2017), or Dryopidae (Costa *et al.* 1999).

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Appendix 1

List of the species of Thaumastodinae of the world

Subfamily Thaumastodinae Champion, 1924
urn:lsid:zoobank.org:act:19F0D808-0024-490C-8253-5486727F9C9B

Genus *Acontosceles* Champion, 1924
urn:lsid:zoobank.org:act:22065D0C-EF27-45ED-9A42-3FF6BBD1F02C

Acontosceles hydroporoides species group (sensu Pütz 2008)

Acontosceles borneensis sp. nov. (Malaysia [Borneo])
urn:lsid:zoobank.org:act:2582F411-8790-4937-B6A0-248899FD9208

Acontosceles chujoi Yoshitomi & Satô, 2005 (Laos, Vietnam)
urn:lsid:zoobank.org:act:32D060AE-982D-41F3-924D-92A1096AE4CE

Acontosceles hydroporoides Champion, 1924 (India)
urn:lsid:zoobank.org:act:F46F765F-6E3D-4AD2-AAD2-C13F5C261B6E

Acontosceles jaechi Pütz, 2008 (Philippines [Bohol])
urn:lsid:zoobank.org:act:255AAD2A-DA25-4E3C-909F-D1618D5EB13A

Acontosceles javanicus Yoshitomi & Putra, 2011 (Indonesia [Java])
urn:lsid:zoobank.org:act:A8492B62-6953-445C-AF68-25460E7CB19D

Acontosceles negrosensis Pütz, 2008 (Philippines [Negros])
urn:lsid:zoobank.org:act:557BCBC3-8F92-47A9-983E-F9518491A6E3

Acontosceles tagalog Spilman, 1959 (Philippines)
urn:lsid:zoobank.org:act:EBC9A1BA-BB26-4C12-B5BA-6815D1F99ECB

Acontosceles yorioi Satô, 1966 (Japan [Okinawa-jima, Iriomote-jima], Taiwan)
urn:lsid:zoobank.org:act:4D9B9FFD-44E4-4A1F-84FA-E7173E64A7D8

Acontosceles quatuordecimmaculosus species group (sensu Pütz 2008)

Acontosceles quatuordecimmaculosus Pütz, 2008 (Myanmar)
urn:lsid:zoobank.org:act:1EE4A8B9-22A6-42E4-8F51-DBD1B77B4B88

Acontosceles siwalikensis Pütz, 2008 (Nepal)
urn:lsid:zoobank.org:act:9AE002BE-1FEF-4FB8-A3B5-A8943CB1989C

Acontosceles yunnanensis Pütz, 2008 (China [Yunnan])
urn:lsid:zoobank.org:act:64F5AC37-E237-4C0C-9615-DDB748F577C4

Acontosceles zetteli Pütz, 2008 (Thailand, Laos)
urn:lsid:zoobank.org:act:5D994D2B-317D-48B7-9AA0-3271DE288BF2

Genus ***Martinius*** Spilman, 1959
urn:lsid:zoobank.org:act:D1657311-552F-4517-9F3E-204464C12109

Martinius ripisaltator Spilman, 1966 (Cuba)
urn:lsid:zoobank.org:act:5BF966A0-9A9A-4156-904B-F4C3561AEC2D

Martinius tellipontis Spilman, 1959 (Panama)
urn:lsid:zoobank.org:act:1A894F79-DE95-4846-952B-039B426CC41E

Martinius temporalis Wooldridge, 1988 (Ecuador)
urn:lsid:zoobank.org:act:E93DD6FC-2356-437F-882E-80909CC5E68B

Genus ***Mexico*** Spilman, 1972
urn:lsid:zoobank.org:act:A7037F96-6A97-4838-A4B5-A3D090307D6C

Mexico baliensis sp. nov. (Indonesia [Bali Island])
urn:lsid:zoobank.org:act:98D64DE9-6A33-4EBF-A7F9-26F9A7BA409E

Mexico borneensis sp. nov. (Malaysia [Borneo])
urn:lsid:zoobank.org:act:C119FDE3-9A59-4A07-A77A-AF4C067C5D1B

Mexico litoralis Spilman, 1972 (Mexico)
urn:lsid:zoobank.org:act:10667682-8B8C-4E02-9AC3-678D8B291954

Mexico masamii (Satô, 1994) (Japan [Honshu, Izu Islands, Shikoku, Kyushu, the Ryukyus])
urn:lsid:zoobank.org:act:85474634-5E5A-4F83-AD88-EDA6242183A0

Mexico morrisoni Skelley, 2005 (Bahamas)
urn:lsid:zoobank.org:act:0D1B37BE-BF21-4679-A711-2B0C15A6AC96

Mexico ogasawaraensis sp. nov. (Japan [Ogasawara Islands])
urn:lsid:zoobank.org:act:8B1989C3-5D1B-4E9C-A87F-0ED19524F6D4

Mexico palauensis sp. nov. (Palau)
urn:lsid:zoobank.org:act:9A734C2D-BF7A-4F05-8628-36655720A091

Mexico papuanus sp. nov. (Papua New Guinea)
urn:lsid:zoobank.org:act:DB69DE47-18E6-4FA0-8D94-A9A95470D78E

Mexico splendens (Hernando & Ribera, 2003) (Tonga Islands)
urn:lsid:zoobank.org:act:119CC677-2FBF-4117-B0DA-3931B3A6CDF1

Mexico taiwanus (Satô, 1994) (Taiwan, Japan [Yonaguni-jima])
urn:lsid:zoobank.org:act:CBAA7928-BE17-4A2B-AF43-1E2D35FBD09E

Genus ***Pseudeucinetus*** Heller, 1921
urn:lsid:zoobank.org:act:08D0E4C3-6D24-4A42-BB38-961E6BA85773

Pseudeucinetus javanicus Yoshitomi & Putra, 2010 (Indonesia [Java, Lombok])
urn:lsid:zoobank.org:act:9766FA9E-388C-455E-883E-7FEF7DE27D2A

Pseudeucinetus novabritannica Delève, 1973 (Bismarck Archipelago [New Britain])
urn:lsid:zoobank.org:act:D4F058A4-8841-48EF-B1EA-03BA40B1B6E2

Pseudeucinetus papuanus sp. nov. (Papua New Guinea)
urn:lsid:zoobank.org:act:978D5D6D-8D48-425D-AB1B-0536A2E10753

Pseudeucinetus solomonicus Yoshitomi & Putra, 2010 (Solomon Islands [Santa Catalina, Santa Anna])
urn:lsid:zoobank.org:act:113B8D47-F5AA-4EC7-8F07-9921CB8347D8

Pseudeucinetus spilmani Spangler, 1995 (Indonesia [Bacan])
urn:lsid:zoobank.org:act:9DAB932B-0495-4EE9-B97D-AAA873871A2E

Pseudeucinetus uenoi Spangler, 1995 (Malaysia [Borneo])
urn:lsid:zoobank.org:act:5CC8AB17-8B02-4170-97C2-7A18F85D751D

Pseudeucinetus zygops Heller, 1921 (India, Malaysian Peninsula, Bismarck Islands [New Ireland], the Philippines [Balabac, Palawan, Mindanao, Negros], Indonesia [Sulawesi])
urn:lsid:zoobank.org:act:7903C913-85A7-4AE6-B4E4-619A86BB46CB

Appendix 2

Characters used in the phylogenetic analysis

Character 1. Body shape: oval (0); oblong (1).
Character 2. Reception of legs in venter: absent (0); present (1)
Character 3. Eyes: moderate size, situated on lateral side of head (0); large size, situated on dorso-lateral side of head (1).
Character 4. Antennal segments: 11 (0); 7 (1).
Character 5. Antennae inserted: near eyes (0); near mandibles (1).
Character 6. Antennal groove on gena: absent (0); present (1).
Character 7. Tarsal formula: 5-5-5 (0); 4-4-4 (1); 4-5-5 (2).
Character 8. Hind coxa: normally visible ventrally (0); hidden by hind coxal plate and invisible ventrally (0).
Character 9. Hind legs: without tibial spurs (0); with tibial spurs (1).
Character 10. Male fore tarsi: normal (0); enlarged (1).
Character 11. Aedeagus: without extra plate (0); with ventral plates (1).
Character 12. Male genitalia: lateral lobe with short setae and punctures (0); with extra long setae (1).
Character 13. Male genitalia: medial lobe shorter than lateral lobe (0); longer than lateral lobe (1).
Character 14. Female genitalia: coxite pointed at apex, attached in apical part of bacillus (0); obtuse and bifid at apex, attached in apical sixth of baculus (1).

Appendix 3

Data matrix for phylogenetic analysis

Character no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Acontosceles	1	0	1	0	0	0	2	0	1	0	0	0	0	0
Pseudeucinetus	1	0	1	0	1	1	1	1	1	1	0	0	0	0
Mexico	1	0	1	0	0	1	1	1	1	0	1	1	1	1
Martinius	1	0	1	1	1	0	1	1	1	0	0	0	1	1
Limnichus	0	1	0	0	0	0	0	0	0	0	0	0	0	0

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