

A review of the genus *Xotidium* Löbl, 1992 (Coleoptera, Staphylinidae, Scaphidiinae), with descriptions of five new species

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Abstract

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In the present study, we have reviewed all species of the genus *Xotidium* Löbl, 1992, as well as five new species from Borneo, Malaysia, and Sulawesi, Indonesia, namely, *Xotidium flagellum* sp. n., *X. heissi* sp. n., *X. meridionale* sp. n., *X. smetanai* sp. n., *X. tarantulatium* sp. n. A key to all *Xotidium* species is provided. The female genitalic characters of *Xotidium* are illustrated and described for the first time.

Key Words

Shining fungus beetle

Baeocera group

female genitalia

Borneo

Sulawesi

key to species

Introduction

The genus *Xotidium* Löbl, 1992, currently comprises seven species from the subtropical and tropical regions of Mauritius, Sri Lanka, the Himalayas, the Lesser Sunda Islands, the Philippines, and Eastern Australia. Members of this genus have narrow body with approximate mesocoxae and metacoxae. They appear to be related to the members of *Scaphoxium* Löbl, 1979 and *Toxidium* LeConte, 1860, belonging to the *Toxidium* group because of the shared approximate mesocoxae and metacoxae. However, this genus was included in the *Baeocera* group by Leschen and Löbl (2005) based on seven synapomorphies. *Xotidium* can be readily distinguished from *Scaphoxium* and *Toxidium* by the presence of multidentate mandibles, two-segmented labial palpi, pronotum with anterior bead, and the presence of secondary lines of mesoventrite. They may be collected from fungi growing

up rotten woods and accumulated litter on the forest floor, based on collection data and personal observation. They are also usually found in the higher altitudes of forested areas. However, their feeding habits and natural history still remain unknown. *Xotidium* is distributed exclusively in the subtropical and tropical parts of Palaeotropical region, excluding Neotropical region, parts of Indonesia Islands to Australia, and the continental Africa. Some unidentified samples collected from Borneo, Malaysia, which have been preserved at Muséum d'histoire naturelle, Genève, Switzerland, and new samples, which were collected in Sulawesi, Indonesia by the first author, are described below as new species, and new information about their distribution is provided. In addition, female genitalia have been observed to be useful in the scaphidiines for defining a group of species or specific species (Ogawa and Sakai 2011; Ogawa and Löbl 2013). However, such characterization needs further investigation.

In the present study, we have reviewed all the members of *Xotidium* and describe five new species collected from Borneo, Malaysia, and Sulawesi, Indonesia, and present the first reported observations of the female genitalia in *Xotidium*. Moreover, we provide a key to all *Xotidium* species, including these new species.

Material and methods

The examined samples were collected by the first author and procured from the collections deposited at the Natural History Museum, London, United Kingdom (NHM) and the Muséum d'histoire naturelle, Genève, Switzerland (MHNG). We have referred to a study by Ogawa and Löbl (2013) and the references quoted therein for methods and terminology. The photographs of the habitus in dorsal and lateral views were captured using a single-lens reflex camera (Canon® Eos Kiss X7) with a macro photo lens (Canon® MP-E 65mm Macro lens) attached to a stand (LPL® CSC-10), and then the focus-stack images were created using COMBINE ZM. A stereomicroscope and biological microscope with a single-lens reflex camera (described above) were used for illustrations. Measurements of the body length and width and of the antennae were taken using an ocular micrometer under the stereomicroscope, but antennomere I was not measured. Some of the illustrations of the lateral habitus are mirror-reversed because of the symmetrical ventral structure. The label data are given verbatim.

The abbreviations used are as follows: **EL**, length of elytra from base of pronotum to apex of elytra; **EW**, maximum width of elytra; **HW**, maximum width of head including eye; **ID**, interocular distance; **PL**, maximum length of pronotum; **PW**, maximum width of pronotum; **EUMJ**, Ehime University Museum, Matsuyama, Japan; **NHM**, Natural History Museum, London, United Kingdom; **MHNG**, Muséum d'histoire naturelle, Genève, Switzerland; **MZBI**, Museum Zoologicum Bogoriense, Bogor, Indonesia.

Taxonomy

Xotidium Löbl, 1992

Xotidium Löbl, 1992: 573; type species: *Xotidium uniforme* Löbl, 1992.

Diagnosis. Body narrow, usually 1.8 times as long as wide. Maxillary palpomere IV aciculate with some macrosetae (Fig. 2d, h). Labial palpus two segmented, apical segment very slender (Fig. 2c, g). Mentum setose (Fig. 2b). Antenna filiform; antennomere III slender, straight; antennomeres each VII–XI covered with microsetae. Mandible multidentate apically; mola with brush (Fig. 2e, i). Galea broad, without subapical short

bristles. Anterior margin of pronotum with a bead. Posterior angle of pronotum not pointed (obtuse), lateral margin not sinuate, sub-basal stria absent. Eyes weakly emarginate. Prothoracic corbiculum present. Secondary lines of mesoventrite present. Anterior portion of proventrite greatly reduced. Elytra usually with entire basal stria joined with lateral and sutural stria, sometimes sutural stria interrupted. Mesepimeron reduced, small or concealed (Fig. 1). Visible abdominal ventrite I without metacoxal bead. Profemoral ctenidium absent. Meso- and metatibiae with single long spur. Meso- and metacoxae adjacent.

Remarks. The shape of the labral apex in this genus is possibly species specific (Fig. 2a, f).

Xotidium bolmarum Löbl, 2015

Figs 3a, 6a, 7g, 9a

Xotidium bolmarum Löbl, 2015: 119.

Type material examined. Paratypes, 1♂4♀, INDONESIA, LOMBOK IS., SENARO, N slope of Rinjani, 2–5. Feb. 1994, Bolm lgt. 1100m. (MHNG).

Supplemental description of female genitalia. Ovipositor simple: gonostylus with a long apical seta, almost as long as wide: distal gonocoxites elongated (Fig. 9a). Spermatheca connected in medial portion of vagina (Fig. 9a).

Measurements (n = 4). Length (PL+EL): 1.40–1.48 mm, PW: 0.77–0.79 mm, EW: 0.83–0.87 mm, HW: 0.31–0.35 mm, ID: 0.10–0.13 mm, PL/PW: 0.71–0.78, EL/EW: 1.00–1.05. Approximate ratio of each antennal segment in length (width) (n = 1): II 1.1 (0.5) : III 1.0 (0.2) : IV 1.1 (0.2) : V 1.3 (0.2) : VI 1.4 (0.2) : VII 1.4 (0.3) : VIII 1.4 (0.2) : IX 1.7 (0.3) : X 1.3 (0.4) : XI 1.7 (0.5).

Distribution (see Löbl 2015). Indonesia: Lombok.

Xotidium mauritanum (Vinson, 1943)

Figs 4b, 6b, 9g

Toxidium mauritanum Vinson, 1943: 201. Transferred: Leschen and Löbl 2005.

Material examined. 2♂1♀, Mauritius, Le Pouce, 18. XI. 1943, J. Vinson. (MHNG).

Supplemental description of female genitalia. Ovipositor simple: gonostylus short, longer than wide, with a long apical seta: distal gonocoxites elongated and slightly robust (Fig. 9g). Spermathecae undetected.

Measurements (n = 3). Length (PL+EL): 1.34–1.51 mm, PW: 0.72–0.79 mm, EW: 0.75–0.85 mm, HW: 0.32–0.34 mm, ID: 0.11–0.13 mm, PL/PW: 0.71–0.74, EL/EW: 1.08–1.11. Approximate ratio of each antennal segment in length (width) (n = 1): II 1.5 (0.5) : III 1.0 (0.3) : IV 1.0 (0.3) : V 1.0 (0.3) : VI 1.1 (0.3) : VII 1.5 (0.4) : VIII 1.1 (0.3) : IX 1.5 (0.5) : X 1.5 (0.6) : XI 1.8 (0.7).

Distribution (referred to Vinson 1943). Mauritius.

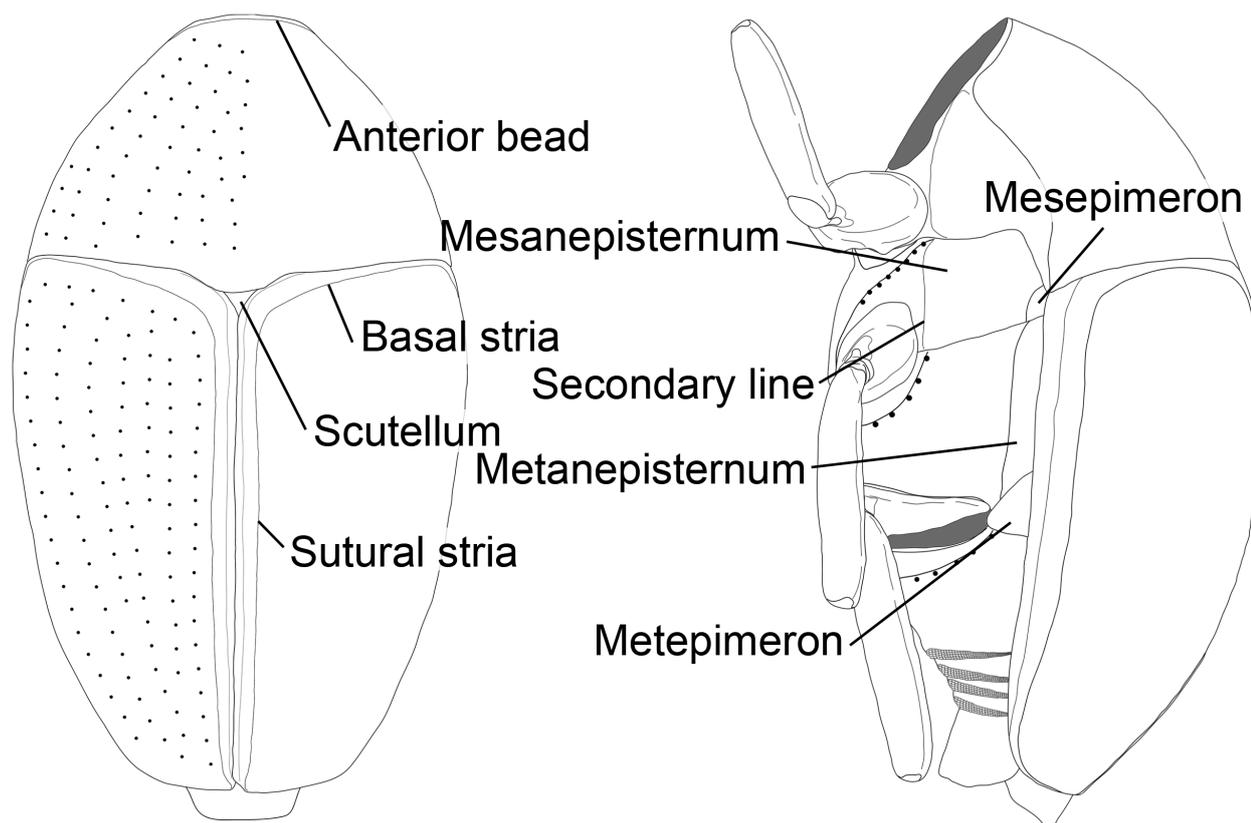


Figure 1. Terminology. Model: *Xotidium uniforme* Löbl.

Xotidium montanum (Löbl, 1971)

Figs 3c, d, 6c, 7e, 9b

Toxidium montanum Löbl, 1971: 1000. Transferred: Löbl 1992.

Type material examined. Holotype, 1♂, CEYLAN Central, Nuwera Eliya, 1950m, 29. I. 1970, Mussard Besuchet Löbl, MHNG ENTO 00005403 (MHNG).

Paratypes, 4♂, same data as holotype; 2♂1♀, same data as holotype, but 15. II. 1970. (MHNG).

Additional material examined. 1♀, SRI LANKA, 29. iv.–1. v., Idalgashinna, 1400m, 25km SW Badulla, Z. Kejval leg. 1994 (MHNG)

Supplemental description of female genitalia. Ovipositor simple: gonostylus with a long apical seta, distinctly longer than wide; distal gonocoxites elongated (Fig. 9b). Spermatheca connected in medial portion of vagina (Fig. 9b).

Measurements (n = 6). Length (PL+EL): 1.38–1.48 mm, PW: 0.73–0.83 mm, EW: 0.79–0.87 mm, HW: 0.32–0.36 mm, ID: 0.13–0.14 mm, PL/PW: 0.64–0.75, EL/EW: 1.00–1.10. Approximate ratio of each antennal segment in length (width) (n = 1): II 1.4 (0.5) : III 1.0 (0.3) : IV 1.1 (0.3) : V 1.3 (0.3) : VI 1.3 (0.3) : VII 1.6 (0.5) : VIII 1.3 (0.4) : IX 1.9 (0.6) : X 1.8 (0.6) : XI 1.9 (0.8).

Distribution (see Löbl 1971). Sri Lanka.

Remarks. This species is variable in the color of elytra as shown in Fig. 3c, d.

Xotidium notatum (Löbl, 1977)

Figs 4c, d, 6d, 7c, 9f

Toxidium notatum Löbl, 1977: 65. Transferred: Löbl 1992.

Type material examined. Holotype, 1♂, Acacia Plat. N. S. W., J. Armstrong, W. Steel coll., B. M. 1969-552 (NHM).

Paratype, 1♂, N. S. Wales, Acacia Plat, J. Armstrong (MHNG).

Additional material examined. 3♂, Queensland, Umg, Brisbane, Wachtel. V. 1981; 1♂1♀, Monsildale Via Kilcay, S. E. Qld., 22. IV. 1963, Monteith; 1♀, N. S. W. Sydney, Oxford falls, litter + bails, Au: 33, 29. X. 1982, Endrödy-Younga (MHNG).

Supplemental description of female genitalia. Ovipositor simple: gonostylus with a long apical seta, almost as long as wide; distal gonocoxites elongated (Fig. 9f). Spermatheca connected in medial portion of vagina.

Measurements (n = 5). Length (PL+EL): 1.19–1.38 mm, PW: 0.62–0.68 mm, EW: 0.66–0.74 mm, HW: 0.32–0.36 mm, ID: 0.09–0.13 mm, PL/PW: 0.67–0.74,

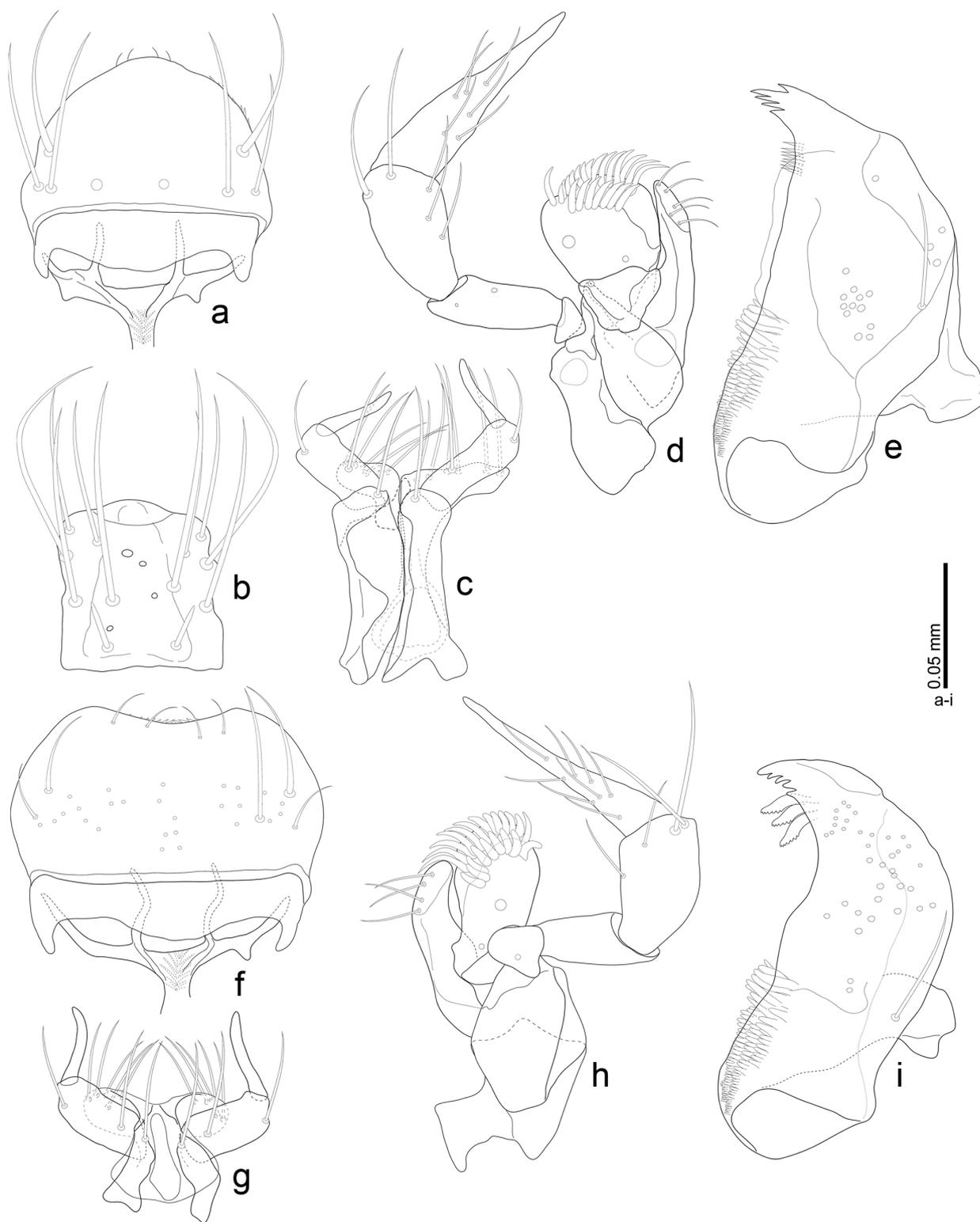


Figure 2. Mouth parts. **a, f** Labrum; **d, h** maxillae; **e, i** mandible; **c, g** labium; **b** mentum. **a–e** *Xotidium smetanai* sp. n.; **f–i** *X. tarantulum* sp. n. **a, f, i, e** Dorsal view; **b, c, d, g, h** ventral view.

EL/EW: 1.08–1.24. Approximate ratio of each antennal segment in length (width) ($n = 1$): II 1.2 (0.5) : III 1.0 (0.3) : IV 1.0 (0.3) : V 1.2 (0.3) : VI 1.3 (0.3) : VII 1.5 (0.4) : VIII 1.4 (0.3) : IX 1.6 (0.5) : X 1.5 (0.5) : XI 2.0 (0.6).

Distribution (see Löbl 1977). Australia: New South Wales and Queensland.

Remarks. The male genitalia have a long sclerite (Fig. 7c), given as short in Löbl (1977). Moreover, the body color is variable (Fig. 4c, d).

***Xotidium pygmaeum* (Löbl, 1971)**

Figs 4a, 6e, 7a, 9d

Toxidium pygmaeum Löbl, 1971: 998. Transferred: Löbl 1992.**Type material examined.** Holotype, 1♂, CEYLAN Central, Kandy, 700 m, 16. II. 1970, Mussard Besuchet Löbl, MHNG ENTO 00005402 (MHNG).

Paratypes, 9♂2♀, same data as holotype, but 14. II. 1970 (MHNG); 1♂, same data as holotype (MHNG).

Supplemental description of female genitalia. Ovipositor simple: gonostylus with a long apical seta, distinctly longer than wide; distal gonocoxites elongated (Fig. 9d). Spermathecae undetected.**Measurements** (n = 5). Length (PL+EL): 1.11–1.19 mm, PW: 0.66–0.68 mm, EW: 0.68–0.74 mm, HW: 0.26–0.30 mm, ID: 0.09–0.11 mm, PL/PW: 0.66–0.69, EL/EW: 0.97–1.03. Approximate ratio of each antennal segment in length (width) (n = 1): II 1.3 (0.7) : III 1.0 (0.4) : IV 1.1 (0.3) : V 1.2 (0.4) : VI 1.3 (0.4) : VII 1.5 (0.5) : VIII 1.3 (0.4) : IX 1.7 (0.6) : X 1.3 (0.6) : XI 1.7 (0.7).**Distribution** (see Löbl 1971). Sri Lanka.***Xotidium tubuliferum* Löbl, 2011**

Fig. 7f

Xotidium tubuliferum Löbl, 2011: 720.**Material examined.** 1♂, Tarragona, Leyte I. Philippine islds VIII: II: 1945 / Col. & pres. by C. L. Remington /in rotting burned log. [pronotum and head missing] (MHNG).**Distribution** (referred to Löbl 2011). Philippines: Leyte.***Xotidium uniforme* Löbl, 1992**

Figs 1, 3b, 6f, 7d, 9c

Xotidium uniforme Löbl, 1992: 575.**Type material examined.** Holotype, 1♂, E. NEPAL: KOSI, Val. Induwa Kola, 2100 m, 17. IV. 1984, Löbl – Smetana (MHNG).

Paratypes, 1♀, INDE Kumaon (UP), Rangarh nr. 6b, ewu. 2000m, I. Löbl, 9. X. 1979; 2♂, INDE: HTM. PM. PR., 10km, NW Sarahan, 1700m, 7. X. 1988, S. Vit; 3♂1♀, 414, Sankhua Sabha Distr., Arun Valley, Chichila, 1900–2000m, Quercus forest, bushes near village, 18–20. VI. 1988, J. Martens & W. Schawaller (MHNG).

Supplemental description of female genitalia. Ovipositor simple: gonostylus with a very long apical seta, slightly longer than wide; distal gonocoxites elongated (Fig. 9c). Spermatheca connected in medial portion of vagina (Fig. 9c).**Measurements** (n = 5). Length (PL+EL): 1.58–1.63 mm, PW: 0.85–0.88mm, EW: 0.92–0.96 mm, HW: 0.36–0.38 mm, ID: 0.10–0.14 mm, PL/PW: 0.71–0.75, EL/EW: 1.02–1.08. Approximate ratio of each antennal segment in length (width) (n = 1): II 1.4 (0.6) : III 1.0 (0.2) : IV 1.2 (0.3) : V 1.3 (0.2) : VI 1.3 (0.3) : VII 1.6 (0.4) : VIII 1.4 (0.3) : IX 1.8 (0.4) : X 1.5 (0.5) : XI 1.6 (0.5).**Distribution** (see Löbl 1992). India: Himachal Pradesh, Uttarakhand (Kumaon); Nepal.**New taxa*****Xotidium flagellum* Ogawa & Löbl, sp. n.**<http://zoobank.org/0E041090-CDCA-4A1A-A71C-57997CBD7B7A>
Figs 5b, 6h, 8d**Type material.** Holotype, 1♂, Borneo Sabah, Mt. Kinabalu N. P. summit tr. Pondok Lowii, 2300–2400 m, 28. IV. 1987, A. Smetana, MHNG ENTO 00008953 (MHNG).**Etymology.** The species epithet refers to the presence of a flagellum in the internal sac.**Description (male).** Dorsal and ventral surface almost reddish-brown (Fig. 5b). Antennae almost yellowish-brown, antennomeres VI–XI blackish. Legs reddish-brown to brown; tarsi paler than tibiae and femora. Head, pronotum, and elytra sparsely and finely pubescent.

Head with eye width almost the same as interocular distance. Punctuation sparse and fine.

Pronotum wider than long. Punctuation sparse and fine, as on head. Scutellum with exposed apex.

Elytra as long as wide, widest at basal fourth, lateral margins sharply narrowed apically, minutely serrate at inner part of posterior margin. Punctuation fine and sparse as on pronotum. Sutural striae extending outwards along basal margin to form basal striae, reaching humeral area and joined with lateral striae.

Hypomeron and lateral portion of mesoventrite smooth. Lateral portion of metaventrite finely and sparsely punctate. Metanepisternum about four times as long as wide, without longitudinal line. Mesepimeron almost as long as wide. Metacoxa about six times as wide as metacoxal process. Ventrite I sparsely and finely punctate.

Protarsomere V about three times as long as each I–IV. Mesotarsomere I about three times as long as each II–IV; V about 2.5 times as long as each II–IV. Metatarsomere I about twice as long as each II and III; each II and III about 1.5 times as long as IV; V about twice as long as IV.

Protarsomeres I–III possibly with tenent setae, but invisible at ×80 magnification, not enlarged. Aedeagus about 0.52 mm long; parameres symmetrical, with moderately widened apical section much longer than third of total parameral length; internal sac with a sinuate and curved flagellum, widened basally and apically (Fig. 8d).

Female. Unknown.

Measurements (n = 1). Length (PL+EL): 1.23 mm, PW: 0.65 mm, EW: 0.69 mm, HW: 0.30 mm, ID: 0.13



Figure 3. Habitus of previously described species. **a** *Xotidium bolmarum* Löbl; **b** *X. uniforme* Löbl; **c, d** *X. montanum* (Löbl). **a, d** Paratype; **c, b**, holotype. Scale: 1 mm.

mm, PL/PW: 0.62, EL/EW: 1.19. Approximate ratio of each antennal segment in length (width) ($n = 1$): II 1.4 (0.7) : III 1.0 (0.3) : IV 1.1 (0.2) : V 1.3 (0.3) : VI 1.5 (0.3) : VII 1.7 (0.4) : VIII 1.6 (0.3) : IX 1.9 (0.5) : X 1.7 (0.5) : XI 1.9 (0.6).

Distribution. East Malaysia: Sabah.

Remarks. This species is very similar to *X. pygmaeum* (Löbl) in the smaller body, but may be easily distinguished by the very long flagellar sclerite of male genitalia.

***Xotidium heissi* Ogawa & Löbl, sp. n.**

<http://zoobank.org/E978428E-9E12-4BF2-A819-AB3BBCE140A0>
Figs 5a, 6i, 8a

Type material. Holotype, 1♂, Brunei/Temburong, Kuala Belalong FSC, 60–300 m, 16–20. IV. 1993, mixed Dipterc. for., E. Heiss, MHNG ENTO 00008955 (MHNG).

Paratype, 1♂, SABAH: Porig Hot, Springs, 500 m, 6. V. 1987, Burckhardt – Löbl, MHNG ENTO 00008956 (MHNG).

Etymology. This species epithet is named in honour of the collector of the holotype, E. Heiss from Innsbruck, Austria.



Figure 4. Habitus of previously described species. **a** *Xotidium pygmaeum* (Löbl); **b** *X. mauritianum* (Vinson); **c, d** *X. notatum* (Löbl). **a** (left), **c** Holotype; **a** (right), paratype. Scale: 1 mm.

Description (male). Dorsal and ventral surface almost reddish-brown (Fig. 5a). Antennae almost yellowish-brown, but antennomeres VI–XI blackish. Legs reddish-brown to brown; tarsi paler than tibiae and femora. Head, pronotum, and elytra sparsely and finely pubescent.

Head with eye width almost the same as interocular distance. Punctuation sparse and fine.

Pronotum wider than long. Punctuation sparse and fine, as on head. Scutellum almost as long as wide, with exposed apex.

Elytra almost as long as wide, widest at basal fourth, lateral margins sharply narrowed apically, minutely serrate at inner part of posterior margin. Punctuation fine and sparse as on pronotum. Sutural striae extending outwards along basal margin to form basal striae, reaching humeral area and joined with lateral striae.

Hypomeron and lateral portion of mesoventrite smooth. Lateral portion of metaventricle finely and sparsely punctate. Metanepisternum about four times as long as wide,

without longitudinal line. Metepimeron almost as long as wide. Metacoxa about six times as wide as metacoxal process. Ventrite I sparsely and finely punctate.

Protarsomere V about 2.5 times as long as each I–IV. Mesotarsomere I about 2.5 times as long as each II–IV; V about twice as long as IV. Metatarsomere I about three times as long as each II–IV; V about 1.5 times as long as each II–IV.

Protarsomeres I–III possibly with tenent setae, but invisible at $\times 80$ magnification, not enlarged. Aedeagus 0.54 mm long; parameres symmetrical, with strongly widened apical section longer than third of total parameral length; internal sac with a sinuate flagellar sclerite, basally widened and bent (Fig. 8a).

Female. Unknown.

Measurements (n = 2). Length (PL+EL): 1.33–1.38 mm, PW: 0.73 mm, EW: 0.75–0.78 mm, HW: 0.33–0.35 mm, ID: 0.13 mm, PL/PW: 0.69–0.72, EL/EW: 1.10. Approximate ratio of each antennal segment in length

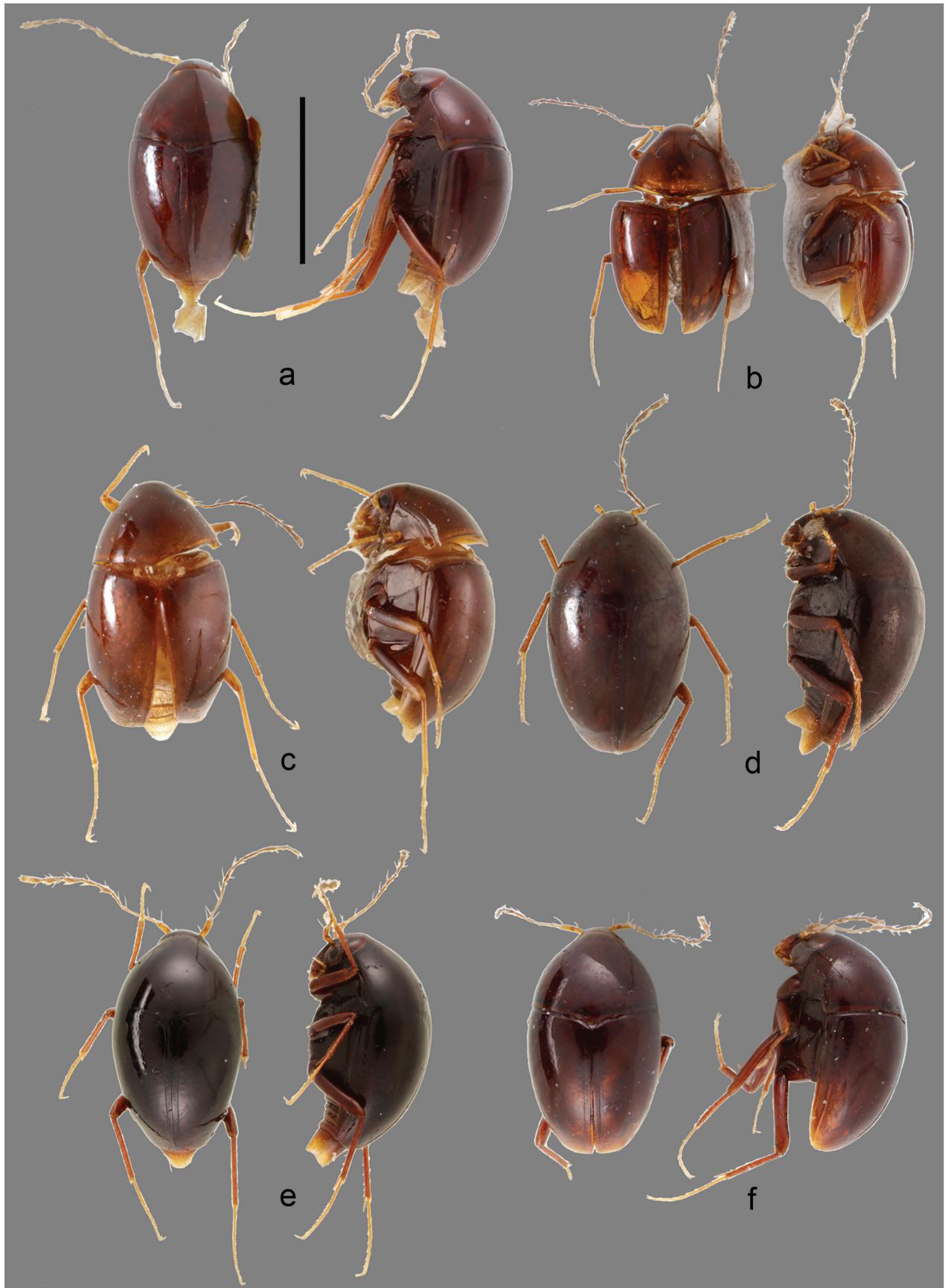


Figure 5. Habitus of new species. **a** *Xotidium heissi* sp. n.; **b** *X. flagellum* sp. n.; **c** *X. smetanai* sp. n.; **d** *X. meridionale* sp. n.; **e, f** *X. tarantulatum* sp. n. Scale: 1 mm.

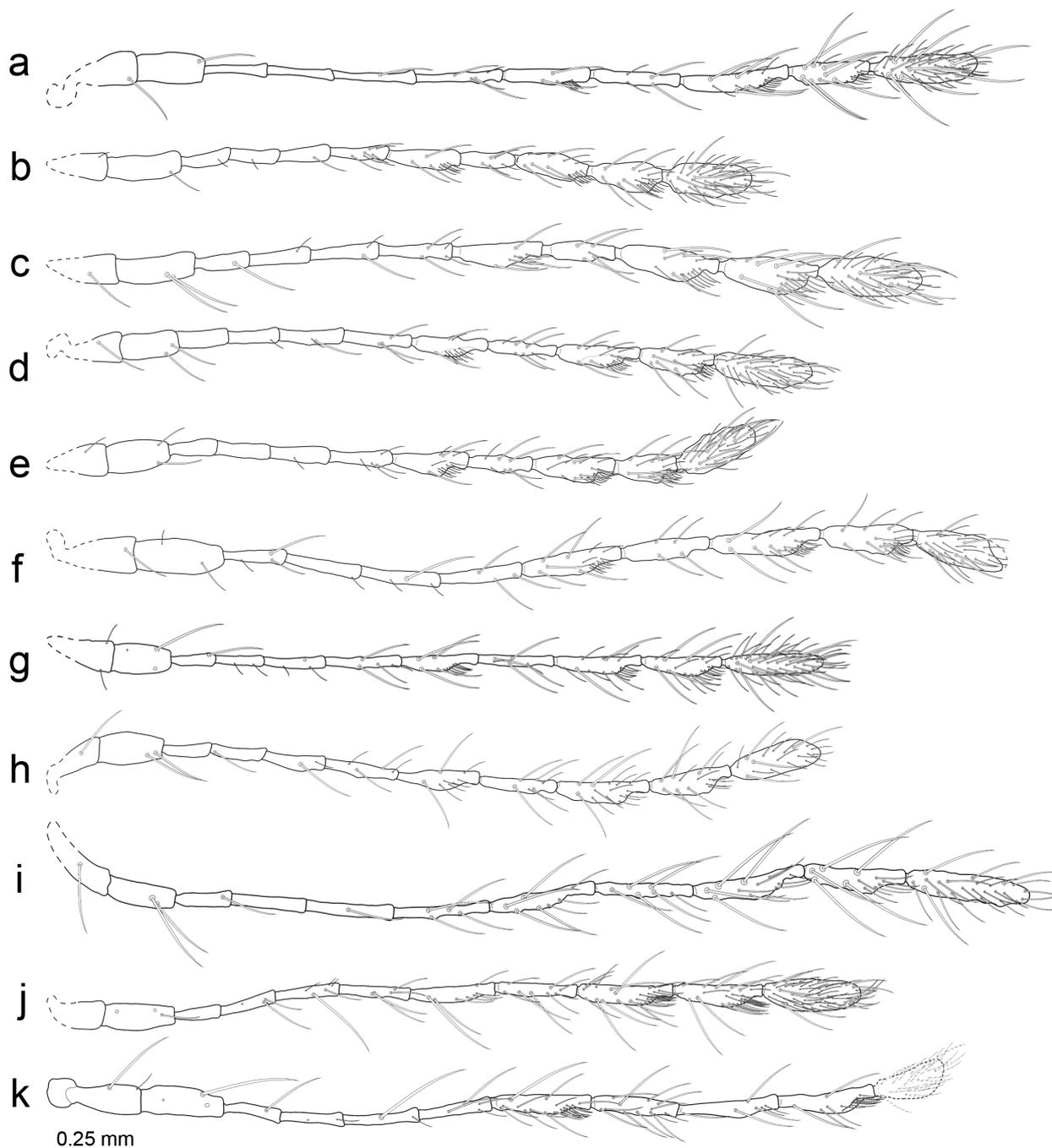


Figure 6. Antennae. **a** *Xotidium bolmarum* Löbl; **b** *X. mauritanum* (Vinson); **c** *X. montanum* (Löbl); **d** *X. notatum* (Löbl); **e** *X. pygmaeum* (Löbl); **f** *X. uniforme* Löbl; **g** *X. tarantulatatum* sp. n.; **h** *X. flagellum* sp. n.; **i** *X. heissi* sp. n.; **j** *X. meridionale* sp. n.; **k** *X. smetanai* sp. n.

(width) (n = 1): II 1.2 (0.4) : III 1.0 (0.3) : IV 1.4 (0.3) : V 1.6 (0.3) : VI 1.8 (0.2) : VII 2.0 (0.3) : VIII 1.8 (0.3) : IX 2.1 (0.5) : X 1.9 (0.5) : XI 2.3 (0.5).

Distribution. Brunei; East Malaysia: Sabah.

Remarks. This species is very similar to *X. bolmarum* Löbl in the reddish body and the body size, but may be easily distinguished by the strongly widened apical portion of parameres and the sinuate sclerite of male genitalia.

***Xotidium meridionale* Ogawa & Löbl, sp. n.**

<http://zoobank.org/BDF620F4-6A62-475D-A6BD-EBDF46959D59>

Figs 5d, 6j, 8e, f

Type material. Holotype, 1♂, Mt. Lompobatang, Malino, S. Sulawesi, alt. ca. 1700m, 5°23'44.20"N, 119°55'22.27"E, 20. I. 2011, R. Ogawa leg. (MZBI).

Etymology. The species epithet is from the Latin *meridionale* meaning southern, referring to Lompobatang located at the southernmost Sulawesi.

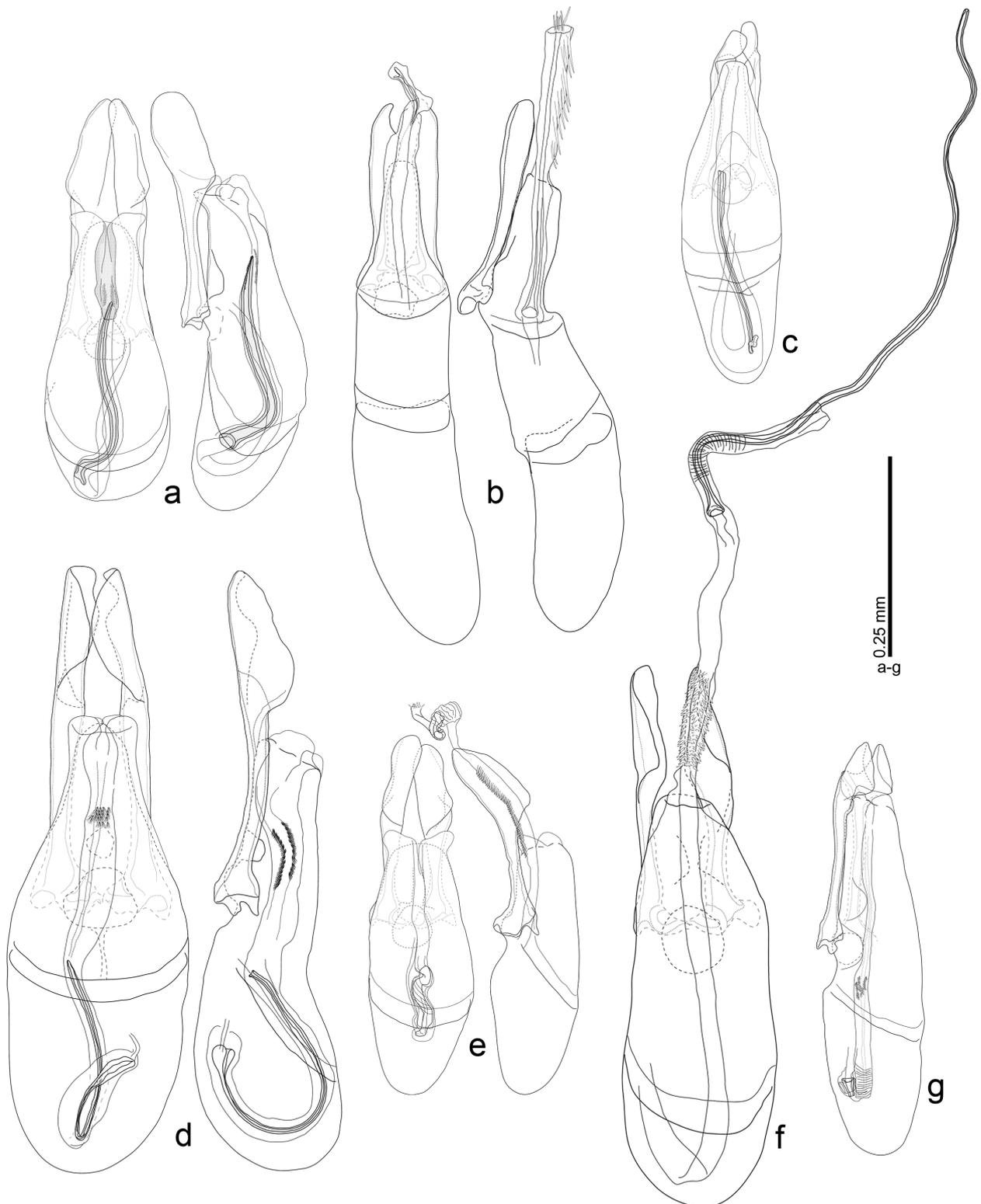


Figure 7. Male genitalia of previously described species from dorsal and lateral views. **a** *Xotidium montanum* (Löbl); **b** *X. mauritianum* (Vinson); **c** *X. notatum* (Löbl); **d** *X. uniforme* Löbl; **e** *X. pygmaeum* (Löbl); **f** *X. tubuliferum* Löbl; **g** *X. bolmarum* Löbl.

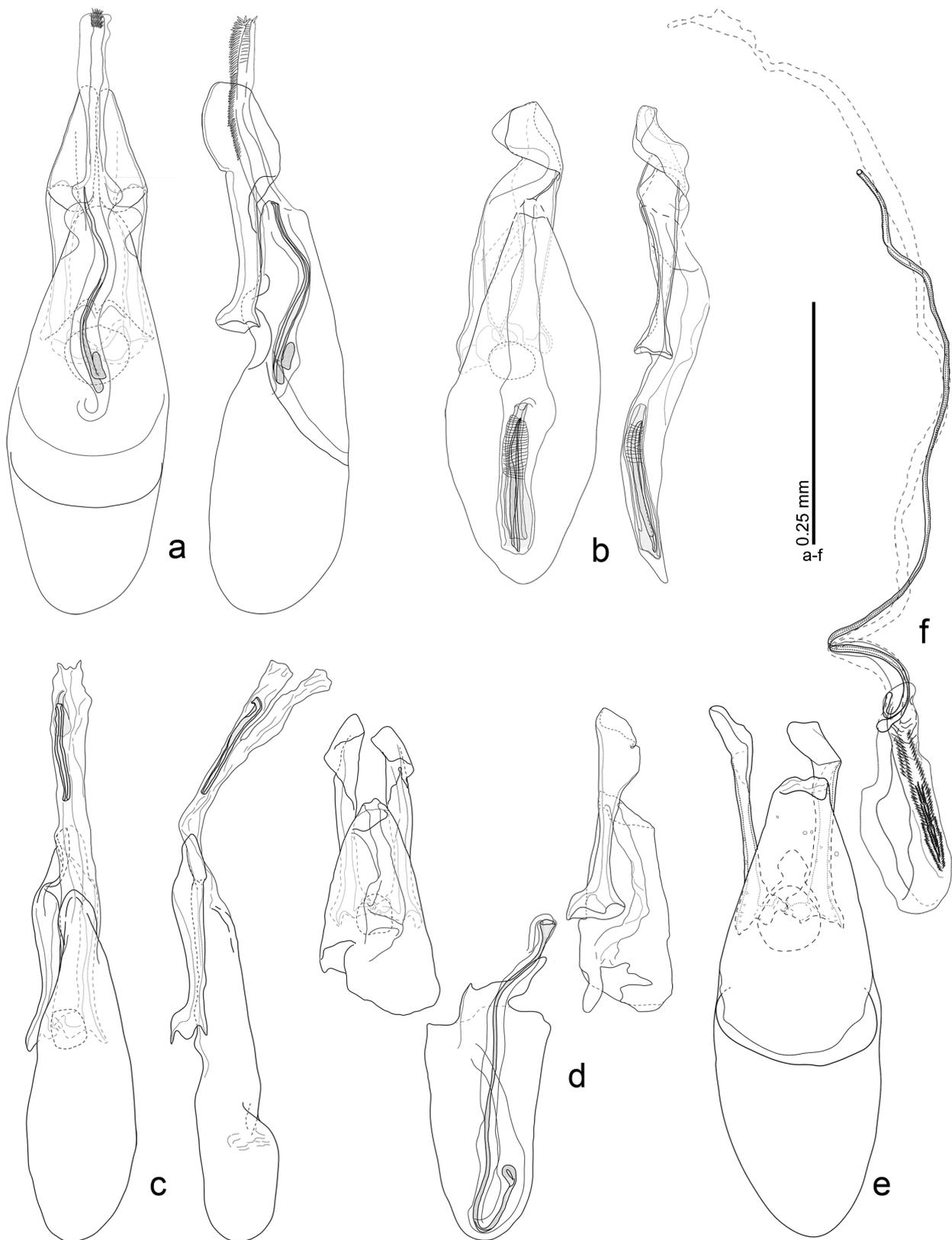


Figure 8. Male genitalia of new species from dorsal and lateral views. **a** *Xotidium heissi* sp. n.; **b** *X. smetanai* sp. n.; **c** *X. tarantulum* sp. n.; **d** *X. flagellum* sp. n.; **e, f** *X. meridionale* sp. n.

Description (male). Dorsal and ventral surface almost dark reddish-brown to brown (Fig. 5d). Antennae almost yellowish-brown, but antennomeres III–XI blackish. Femora from apical sixth to base darker than tibiae; tibiae reddish-brown to brown; tarsi paler than tibiae. Head, pronotum, and elytra sparsely and finely pubescent.

Head with eye width almost the same as interocular distance. Punctuation sparse and fine.

Pronotum wider than long. Punctuation sparse and fine, as on head. Scutellum with slightly exposed apex.

Elytra longer than wide, widest at basal sixth, lateral margins sharply narrowed apically, minutely serrate at inner part of posterior margin. Punctuation fine and sparse as on pronotum. Sutural striae interrupted at basal third.

Hypomeron and lateral portion of mesoventrite smooth. Lateral portion of metaventrite finely and sparsely punctate. Metanepisternum about four times as long as wide, without longitudinal line. Mesepimeron concealed. Metacoxa about six times as wide as metacoxal process. Ventrite I sparsely and finely punctate.

Protarsomere V about three times as long as each I–IV. Mesotarsomere I about twice as long as each II and III; V about twice as long as IV. Metatarsomere I about 2.5 times as long as each II and III; V about three times as long as IV.

Protarsomeres I–III possibly with tenent setae, but invisible at $\times 80$ magnification, not enlarged. Aedeagus 0.54 mm long; parameres symmetrical, with moderately widened apical section shorter than third of total parameral length; internal sac with a sinuate and very long flagellum (longer than aedeagus), basally widened and bent (Fig. 8f).

Female. Unknown.

Measurements ($n = 1$). Length (PL+EL): 1.43 mm, PW: 0.81 mm, EW: 0.87 mm, HW: 0.34 mm, ID: 0.11 mm, PL/PW: 0.72, EL/EW: 0.98. Approximate ratio of each antennal segment in length (width) ($n = 1$): II 1.5 (0.6) : III 1.0 (0.3) : IV 1.2 (0.3) : V 1.3 (0.3) : VI 1.5 (0.3) : VII 1.8 (0.4) : VIII 1.7 (0.3) : IX 2.0 (0.5) : X 1.9 (0.5) : XI 2.1 (0.7).

Distribution. Indonesia: southern Sulawesi.

Remarks. This species is similar to *X. smetanai* sp. n. in lacking sutural striae and *X. tubuliferum* Löbl in the long sclerite as flagellum of male genitalia, but it is easily distinguished from them by the body color and the widened apical section of parameres.

Xotidium smetanai Ogawa & Löbl, sp. n.

<http://zoobank.org/2D544E21-7439-4786-BDF9-ABEF1DE6915D>

Figs 2a–e, 5c, 6k, 8b

Type material. Holotype, 1♂, Borneo Sabah, Mt. Kinabalu Nat. Pk. HQ Silau-Silau, Tr. 1550 m, 2. IV. 1988, [B171], A. Smetana, MHNG ENTO 00008954 (MHNG).

Etymology. This species epithet is in honour of the collector of its holotype, A. Smetana, Ottawa Canada.

Description. Dorsal and ventral surface almost brown (Fig. 5c). Antennae almost yellowish-brown, antenno-

meres V–XI blackish. Propygidium and pygidium paler than other ventrite. Legs brown to yellowish-brown; tarsi paler than tibiae and femora. Head, pronotum, and elytra sparsely and finely pubescent.

Head with eye width almost the same as interocular distance. Punctuation sparse and fine.

Pronotum wider than long. Punctuation sparse and fine, as on head. Scutellum with slightly exposed apex.

Elytra longer than wide, widest at basal sixth, lateral margins sharply narrowed apically, minutely serrate at inner part of posterior margin. Punctuation fine and sparse as on pronotum. Sutural striae interrupted at basal third.

Hypomeron and lateral portion of mesoventrite smooth. Lateral portion of metaventrite finely and sparsely punctate. Metanepisternum about four times as long as wide, without longitudinal line. Mesepimeron almost as long as wide. Metacoxa about six times as wide as metacoxal process. Ventrite I sparsely and finely punctate.

Protarsomere V 2.5 times as long as each I–IV. Mesotarsomere I about twice as long as II; II 1.2 times as long as each III and IV; V 1.5 times as long as each III and IV. Metatarsomere I about three times as long as each II and III; each II and III 1.1 times as long as IV; V about twice as long as IV.

Protarsomeres I–III possibly with tenent setae, but invisible at $\times 80$ magnification, not enlarged. Aedeagus about 0.5 mm long; parameres symmetrical, with moderately widened apical section slightly longer than third of total parameral length; internal sac with straight, evenly wide flagellar sclerite (Fig. 8b).

Female. Unknown.

Measurements ($n = 1$). Length (PL+EL): 1.53 mm, PW: 0.85 mm, EW: 0.88 mm, HW: 0.35 mm, ID: 0.15 mm, PL/PW: 0.62, EL/EW: 1.14. Approximate ratio of each antennal segment in length (width) ($n = 1$): II 1.5 (0.5) : III 1.0 (0.2) : IV 1.1 (0.3) : V 1.3 (0.2) : VI 1.3 (0.2) : VII 1.7 (0.3) : VIII 1.5 (0.3) : IX 1.8 (0.3) : X 1.7 (0.4) [XI deformed].

Distribution. East Malaysia: Sabah.

Remarks. This species is similar to *X. mauritanium* (Vinson) and *X. meridionale* sp. n. in the reduced sutural striae, but may be easily distinguished from them by the simple sclerite of the male genitalia.

Xotidium tarantulatum Ogawa & Löbl, sp. n.

<http://zoobank.org/5704E1D0-9D28-47ED-957B-6D5EB820D440>

Figs 2 f–i, 5e, f, 6g, 8d, 9e

Type material. Holotype, 1♂, Mt Tilongkabila (Gunung Tilongkabila), N. Sulawesi, alt. ca. 1300m, 0°35'18.14"N, 123°13'22.71"E, 10. VI. 2012, R. Ogawa leg. (MZBI).

Paratypes, 1♂1♀, same data as holotype (EUMJ); 2♂, Mt Tilongkabila (Gunung Tilongkabila), N. Sulawesi, alt. ca. 1300–1500m, 0°35'18.14"N, 123°13'22.71"E – 0°35'18.37"N, 123°13'22.61"E, 10. VI. 2012, R. Ogawa leg. (EUMJ); 1♂, same data as holotype, but 800–1300m, 0°34'28.52"N, 123°11'30.61"E – 0°35'18.14"N, 123°13'22.71"E, 9. VI. 2012 (EUMJ); 1♂, same data

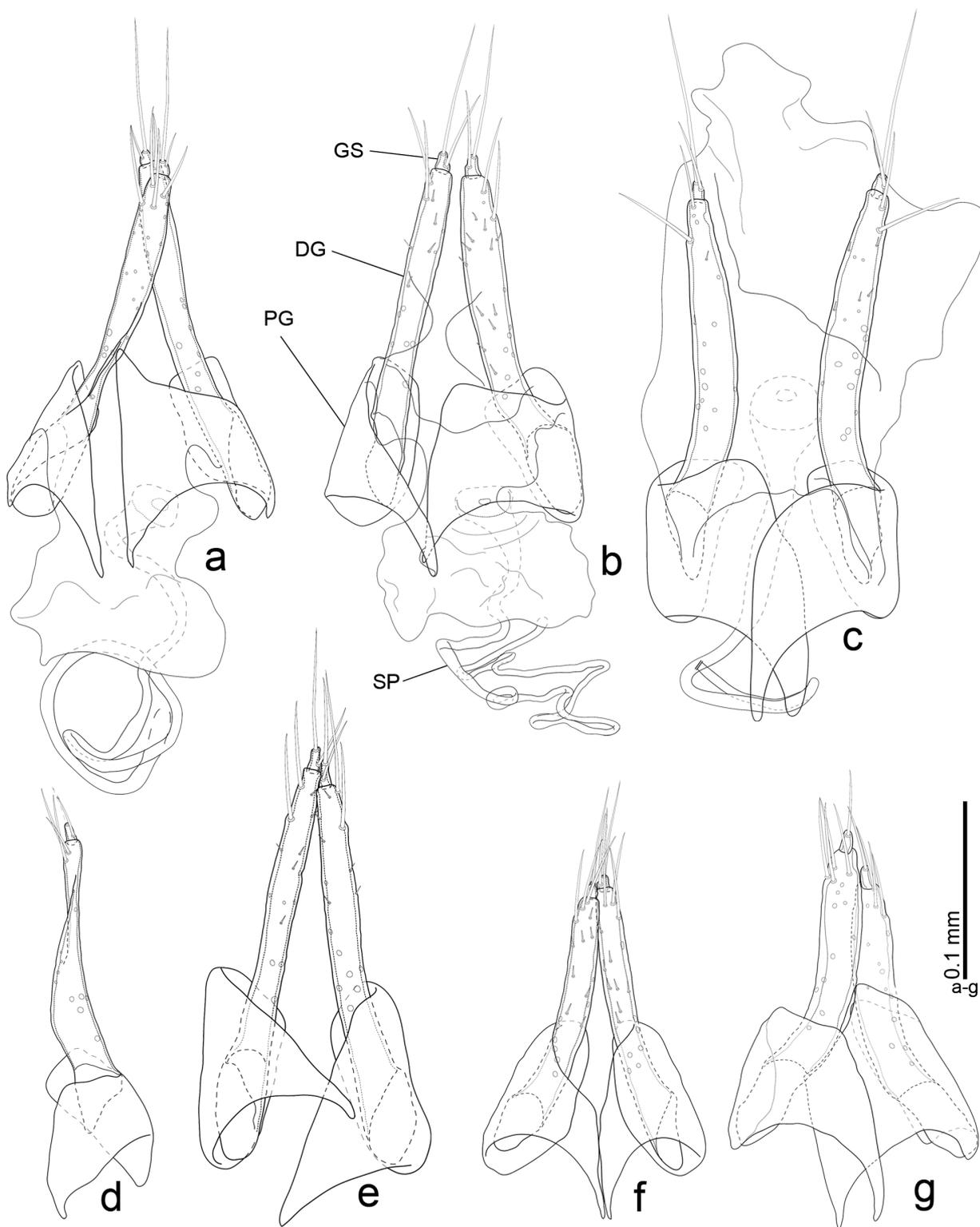


Figure 9. Female genitalia. **a** *Xotidium bolmarum* Löbl; **b** *X. montanum* (Löbl); **c** *X. uniforme* Löbl; **d** *X. pygmaeum* (Löbl); **e** *X. tarantulatum* sp. n.; **f** *X. notatum* (Löbl); **g** *X. mauritianum* (Vinson). **GS** Gonostylus; **DG** Distal gonocoxite; **PG** Proximal gonocoxite; **SP** Spermatheca.

above, but preserved at MHNG; 1♂1♀, Mt. Pontolo, N. Sulawesi, alt. ca. 1400–1800m, 0°54'59.77"N, 122°04'13.10E – 0°54'25.07"N, 122°04'20.73"E, 25. VII. 2012, R. Ogawa leg. (EUMJ); 1♂, under bark of rot-

ten log, Plot C, ca 400m, Lowland forest, INDONESIA SULAWESI UTARA, Dumoga-Bone N.P., February, 1985, R. Ent. Soc. Lond., PROJECT WALLACE, B.M. 1985-10 (NHM).

Etymology. The species epithet is derived from Mapa-la Tarantula, the climbing club of Gorontalo State University.

Description. Dorsal and ventral surface almost black to dark reddish-brown (Fig. 5e, f), except for abdomen dark reddish-brown. Antennae almost yellowish-brown, antennomeres VI–XI blackish. Propygidium and pygidium paler than other ventrite I–III. Legs reddish-brown; tarsi paler than tibiae and femora. Head, pronotum, and elytra sparsely and finely pubescent.

Head with eye width almost the same as interocular distance. Punctuation sparse and fine.

Pronotum slightly wider than long, with an anterior bead. Punctuation sparse and fine, as on head. Scutellum almost as long as wide, with exposed apex.

Elytra almost as long as wide, widest at basal sixth, lateral margins sharply narrowed apically, minutely serrate at inner part of posterior margin. Punctuation fine and sparse as on pronotum. Sutural striae extending outwards along basal margin to form basal striae, reaching humeral area and joined with lateral striae.

Hypomeron and lateral portion of mesoventrite smooth. Lateral portion of metaventrite finely and sparsely punctate. Metanepisternum about four times as long as wide, without longitudinal line. Mesepimeron almost as long as wide. Metacoxa about six times as wide as metacoxal process. Ventrite I sparsely and finely punctate, with microsculpture.

Protarsomere I twice as long as each II–IV; V 2.5 times as long as each II–IV. Mesotarsomere I 2.5 times as long as II; II 1.2 times as long as each III and IV; V 2.5 times as long as each III and IV. Metatarsomere I about three times as long as each II and III; each II and III 1.1 times as long as IV; V about twice as long as IV.

Male. Protarsomeres I–III possibly with tenent setae, but invisible at $\times 80$ magnification, not enlarged. Aedeagus about 0.44 mm long; parameres symmetrical, with weakly widened apical section as long as fourth of total parameral length; internal sac with a sclerite as flagellum, straight, evenly wide, sometimes bent at base.

Female. Protarsomeres I–III not enlarged. Ovipositor simple: gonostylus with a long apical seta, distinctly longer than wide; distal gonocoxites apparently elongated (Fig. 9e). Spermathecae undetected.

Measurements (n = 9). Length (PL+EL): 1.32–1.43 mm, PW: 0.75–0.79 mm, EW: 0.79–0.89 mm, HW: 0.32–0.36 mm, ID: 0.09–0.13 mm, PL/PW: 0.69–0.76, EL/EW: 0.89–1.02. Approximate ratio of each antennal segment in length (width) (n = 1): II 1.3 (0.7) : III 1.0 (0.3) : IV 1.1 (0.2) : V 1.4 (0.3) : VI 1.6 (0.3) : VII 1.7 (0.4) : VIII 1.6 (0.2) : IX 1.9 (0.4) : X 1.7 (0.4) : XI 2.2 (0.5).

Distribution. Indonesia: northern Sulawesi.

Remarks. This species is similar to *X. bolmarum* Löbl from Lombok in its color and body size, but may be easily distinguished by the straight and more elongate sclerite in the internal sac.

Key to the species of *Xotidium* (modified from Löbl 2015)

- 1 Elytra without basal striae, sutural striae shortened..... 2
- Elytra with basal striae, joined to sutural striae..... 4
- 2 Body blackish. Scutellum concealed. Antennomere VIII almost as long as III. Parameres evenly widened. Internal sac without sclerites, slightly sclerotized *X. mauritianum* (Vinson)
- Body brownish. Scutellum slightly exposed. Antennomere VIII more than 1.5 times as long as III. Parameres notably widened at apical portion. Internal sac with a sclerite 3
- 3 Widened apical section of parameres much shorter than a third of total parameral length. Internal sac of aedeagus with a very long flagellum *X. meridionale* sp. n.
- Widened apical section of parameres much longer than a third of total parameral length. Internal sac of aedeagus with a straight sclerite *X. smetanai* sp. n.
- 4 Elytra with distinctive bicolor pattern..... 5
- Elytra uniformly reddish-brown to black..... 6
- 5 Elytra dark, each with light transverse fascia situated in basal half of elytron and light apical part. Pronotum entirely dark..... *X. montanum* (Löbl)
- Elytra light, each darkened along basal and apical margins, usually also darkened along sutural margin. Pronotum light, usually with dark transverse fascia *X. notatum* (Löbl)
- 6 Body length (PL+EL) 1.10–1.25 mm..... 7
- Body length (PL+EL) 1.35–1.65 mm..... 8
- 7 Antennomere X distinctly more than 1.5 times as long as III. Mesotarsomeres II and III each about three times as long as I. Metatarsomeres II and III each about twice as long as I. Internal sac of aedeagus with evenly thick and sinuate sclerite..... *X. pygmaeum* (Löbl)
- Antennomere X about 1.5 times as long as III. Mesotarsomeres II and III each about twice as long as I. Metatarsomeres II and III each three times as long as I. Internal sac of aedeagus with flagellum curved, sinuate, basally and apically thickened *X. flagellum* sp. n.
- 8 Widened apical section of parameres about as long as half of total parameral length. Internal sac of aedeagus with very long, weekly sclerotized and simple tube *X. tubuliferum* Löbl

- Widened apical section of parameres shorter than half of total parameral length..... 9
- 9 Widened apical section of parameres much longer than third of total parameral length..... 10
- Widened apical section of parameres much shorter than third of total parameral length..... 11
- 10 Body length (PL+EL) 1.58–1.63 mm. Antennomere XI less than twice as long as III. Internal sac of aedeagus with an U-shaped flagellum, basally thickened *X. uniforme* Löbl
- Body length (PL+EL) 1.33–1.38 mm. Antennomere XI more than twice as long as III. Internal sac of aedeagus with a sinuate flagellar sclerite, basally thickened and bent..... *X. heissi* sp. n.
- 11 Antennomere XI more than twice as long as III. Internal sac of aedeagus with straight, evenly thickened flagellum *X. tarantulatum* sp. n.
- Antennomere XI less than twice as long as III. Internal sac of aedeagus with short basal sclerites followed by long membranous tube..... *X. bolmarum* Löbl

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