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CALLIDIOPINI BEETLES (COLEOPTERA, CERAMBYCIDAE) IN THE COLLECTION OF MUSEUM ZOOLOGICUM BOGORIENSE, INDONESIA. PART II. GENITALIA AND TAXONOMY OF THE GENUS *TETHIONEA* PASCOE

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ABSTRACT

Species of *Tethionea* Pascoe, 1869, Callidiopini, in the collection of Museum of Zoologicum Bogoriense are reviewed. Two new species of the genus are described, *T. peggieae* sp. nov. and *T. oculata* sp. nov., both from Papua Province, Indonesia. In addition, *T. unicolor* Pascoe, *T. strumosa* Pascoe and *T. tridentata* Pascoe are redescribed. Their male genitalia are documented and illustrated in detail. In particular, the ejaculatory duct complexes of endophalli are carefully observed, as well as 8th sternites and tergites. For *T. oculata* sp. nov., the female genitalia are described. Morphological and taxonomical aspects of these species are discussed.

Key words: Callidiopini, ejaculatory duct complex, endophallus, genitalia, *Tethionea*

INTRODUCTION

In our previous publication, some Callidiopini species in the collection of the Museum of Zoologicum Bogoriense (MZB), Cibinong, Indonesia, were reviewed. Four new species of *Ceresium* or *Examnes* were described, and their male genital organs were documented and illustrated in detail (Yokoi et al., 2019).

In this study, we review the species of *Tethionea*. The genus includes hitherto 24 species, mostly recorded from the Australian Region. It was first introduced by Pascoe, who described four species from the "Moluccas" (Pascoe, 1862, 1869; now generally known as Maluku). In the last century, one new species was described from New Caledonia (Fauvel, 1906), and 12 species and one subspecies were described from New Guinea (Gressitt, 1951, 1955, 1959). Gressitt redescribed *Tethionea*, providing a diagnostic key for the species. In recent years, 6 new species have been described; one each from the Malay Peninsula, Java, Lombok and Borneo, and two species from the Philippines (Hayashi, 1979; Yokoi, 2015; Holzschuh, 2015; Vives, 2015, 2016). More recently, the genus was redescribed based on species from Australia (Ślipiński & Escalona, 2016). *Tethionea* was compared to *Ceresium* by Pascoe and Gressitt. For further consideration of the taxonomy, however, a more advanced material basis is required. Additional species should be explored and closely examined. In the following, two new species are described and three known species redescribed.

For the taxonomy of the Callidiopini, it is important to investigate male genitalia because these provide definitive diagnoses for the species and also indicate relationships with other genera. Particularly important are the ejaculatory duct complexes and the 8th sternite. In recent years, male genitalia of *Ceresium* Newman, 1842, *Oxymagis* Pascoe, 1866, *Examnes* Pascoe, 1869, *Stenodryas* Bates, 1873, and *Falsoibidion* Pic, 1923, were described (Yokoi, 2019, 2021a, 2021b; 2021 in press; Yokoi et al., 2016, 2019). In contrast, the knowledge of genitalia of *Tethionea* is still very limited. In recent years, male genitalia of *Tethionea lassehubweberi* Yokoi were partly described (Yokoi, 2015). Moreover, the male genitalia were included in the above noted description of the Australian *Tethionea* species by Ślipiński and Escalona. Nevertheless, altogether only a small number of *Tethionea* species have been examined. Therefore, male genitalia of three known species, *Tethionea unicolor* Pascoe, *Tethionea strumosa* Pascoe and *Tethionea tridentata* Pascoe are described below, together with those of the new species *Tethionea peggieae* sp. nov. In addition, female genitalia of *Tethionea oculata* sp. nov. are described.

Other interesting aspects of *Tethionea* morphology were also observed. As the venters were not included in the original descriptions of the above three known species, they were investigated anew. Regarding the structure of their maxillary palpi, Pascoe discovered interesting variations, and Gressitt later made a comprehensive observation. Maxillary palpi were re-examined for this publication. Finally, future prospect of the research is outlined in DISCUSSION.

MATERIALS AND METHODS

The method remains basically the same as in our previous publication (Yokoi et al., 2019). The material was provided by the collection of MZB. The specimens thereof were mostly collected in various parts of Indonesia under the auspices of the Indonesian Institute of Science (LIPI). Additionally, specimens collected by the second author in Papua New Guinea are included in the collection. The holotypes and a paratype designated herein will be preserved in MZB.

The abbreviations used for the ratio of the measurement in the descriptions are as follows: BLe- body length measured from apical margin of clypeus to elytral apices; HW- head width across eyes, PL- length of pronotum, PW- maximum width of pronotum, PA- apical width of pronotum, PB- basal width of pronotum, EL- length of elytra, EW- humeral width of elytra.

In this publication, the sclerotized complex of apical endophallus is referred to as “ejaculatory duct complex”, as in the previous publication. The side or direction to which the ejaculatory duct is attached or pointed is referred to as “dorsal “or “apical”.

RESULTS

As a result of the above investigation, we describe two new species of the genus *Tethionea* from Irian Jaya, New Guinea. *Tethionea peggieae* sp. nov. is comparable to a few known species, while *Tethionea oculata* sp. nov. is rather singular in appearance.

In the course of the recent observation, the importance of male genitalia for taxonomy was again underlined. Above all, it was revealed that *Tethionea* essentially shares the similar type of endophallus with *Ceresium, Examnes, Stenodryas and Oxymagis*, four affiliated genera of the same tribe. These results are described below in "Taxonomy". Further, morphological and taxonomical aspects beyond the description of individual species are treated in DISCUSSION. The genitalia, prosternal processes and maxillary palpi of the examined species are discussed there.

Taxonomy

Tethionea peggieae sp. nov.
(Figs 1A-E; 2A-L)

Material examined. Holotype ♂: "**INDONESIA**, Irian Jaya, Freeport Concession Timika. 12 -19.IX. 1997, R. Ubaidillah, Peggie, **97032"**; "Pandans peat swamp, East levee of Minajerwi river. 4. 4099'S. 136.5854'W. 15 m. Malaise trap-1(Site 4)";"7701".

Diagnosis. Pronotum elongated. Pronotal sides uneven; densely, deeply punctate-verrucose. Prosternum densely, deeply punctate-scabrous. Prosternal process narrow, apically feebly expanded. Elytral apices each terminated with an acuminate spine. Legs stout, femora keeled. Upper eye-lobes widely separated from each other.

Etymology. The name of this new species is dedicated to Dr. Djunijanti Peggie, the butterfly curator of Museum Zoologicum Bogoriense, who collected the specimen.

Description.

Measurements. BLe=8.5mm. EL/EW=2.80. HW/PW=0.84. PL/PW=1.15. PA/PW=0.74. PB/PW=0.96.

Color testaceus; antennae and legs paler; setae yellowish.

Head evenly, moderately punctate, nearly hairless. Frons transverse-sub-rectangular, horizontally impressed near apex, with a feeble median groove. The terminal joints of maxillary palpi spatulate, with external sides moderately truncated and opened (Fig. 11F). Vertex broad, widely flattened, hardly concave. Upper eye-lobes narrow, separated from each other by 5/2 the width of lobe or 2/5 the width of occiput. Antennal supports flattened. Antennae reaching the elytral apices with the last articles. Scape stout, clavate, weakly

arcuate, coarsely punctured. Antennomeres 3 and 4 a little shorter than scape; 5 and 6 about 6/5 as long as scape; 7-11 gradually attenuated.

Pronotum longer than broad, glossy, almost hairless; apex strongly and base moderately constricted; disc flattened, regularly punctured, with an impunctate median stripe 2/5 the length of pronotum; sides arcuate, uneven with irregular costae, densely and deeply punctate -verrucose. Scutellum sub-circular.

Elytra each weakly tapering toward apex; terminated by an acuminate spine. The external side of the spine emarginated; the sutural side weakly so. Basal 3/4 of elytra evenly, moderately punctured; hairless. Apical 1/4 with smaller, shallower punctures, some of which are setiferous, each bearing a sub-erect setae of medium length.

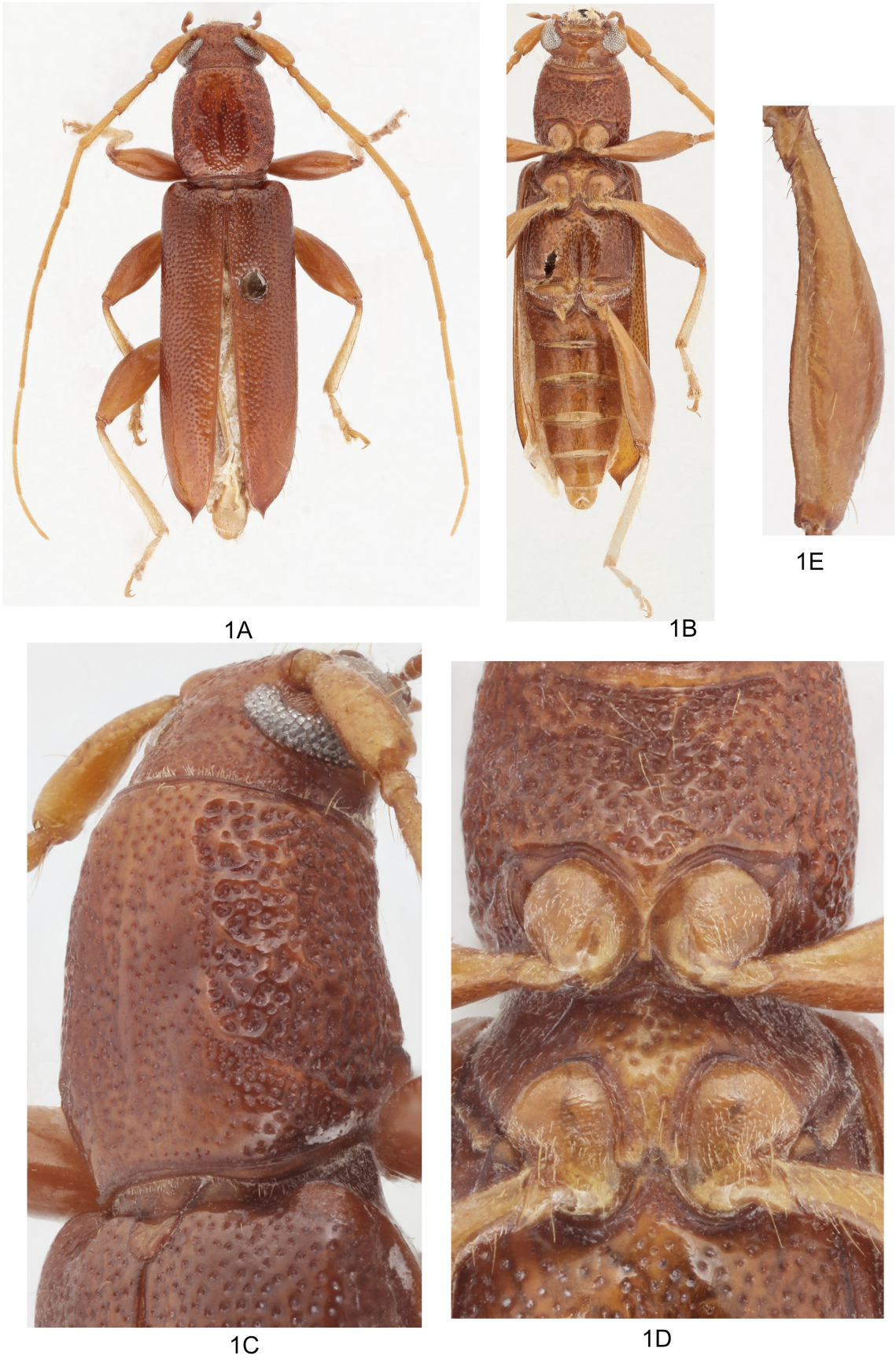
Legs rather short and stout. Femora strongly clavate from base on; ventrally keeled (Fig. 1E).

Venter. Prosternum convex; glossy; deeply, densely punctate-scabrous, with several hairs in the middle. Prosternal process narrow; apex feebly expanded, truncated. Mesoventrite nearly hairless, with sparse though large, deep punctures; moderately elevated toward the process. Mesoventral process with several large setiferous punctures; base broad; apically sub-parallel-sided; apex deeply emarginated in the middle. Metaventrite transverse-sub-rectangular, convex; glossy, regularly provided with sparse though large punctures, which are more or less setiferous in the middle.

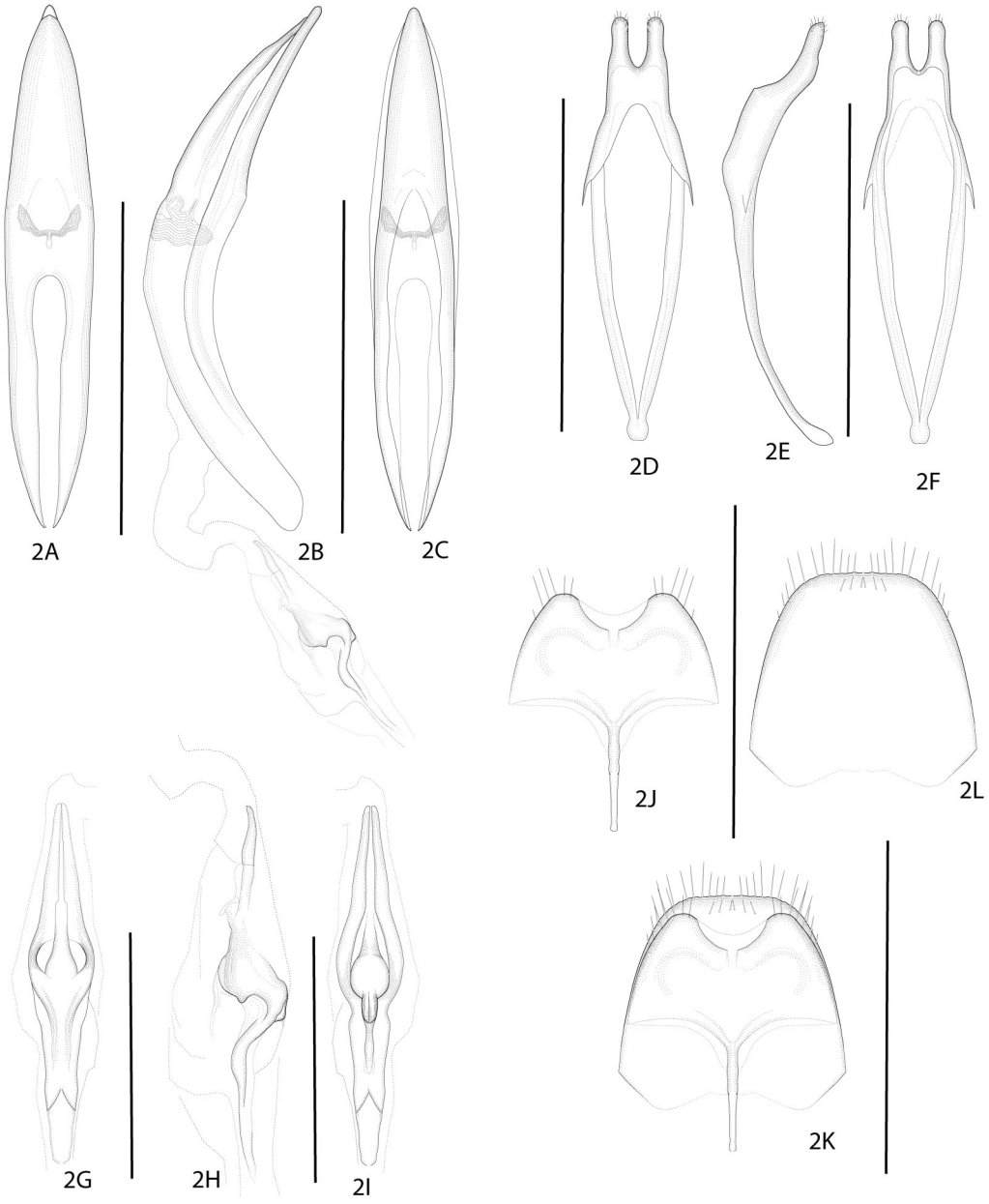
Abdomen gradually narrowed toward apex; sternites 4-7 about 4/5 as long as the third; glossy; with sparse setiferous punctures.

Male genitalia as Figs 2A-L. Median lobe about 2/5 the length of abdomen; fusiform in dorsal view; thick and strongly arcuate in lateral view; dorsal plate dehiscent in the basal half; ventral plate a little longer and narrower than the dorsal, dehiscent in basal 2/3. Tegmen about 4/5 the length of median lobe, arcuate in lateral view. Parameres about 9/20 the length of tegmen; basal half distinctly and apical half feebly tapering toward apex; apical 1/4 bi-lobed; each lobe with several short, stout apical setae. Ejaculatory duct complex as Figs 2G-I; about half as long as median lobe; slender, composed of three inter-connected sclerites; apical sclerite composed of two elongated rod-like structures; median sclerite stout, with a prominent horn-shaped projection; basal sclerite elongated, flattened, apically dehiscent. 8th sternite in gingko-leave-form; blade widely thinned in the middle, with several apical setae; peduncle a little shorter than blade. 8th tergite truncated on apex; apical 2/3 sub-congruent with 8th sternite; apical setae similar to those of the sternite.

Distribution. Papua Province, Indonesia (New Guinea).



Figures 1A-E. *Tethionea peggieae* sp. nov. Holotype male. 1A, habitus, dorsal view; 1B, ditto, ventral view; 1C, head and pronotum, latero-dorsal view; 1D, thorax, ventral view; 1E, hind femur.



Figures 2A-L. *Tethionea peggieae* sp. nov. Holotype male. Genitalia. 2A, median lobe, dorsal view; 2B, ditto, lateral, with endophallus; 2C, ditto, ventral; 2D, tegmen, dorsal view; 2E, ditto, lateral; 2F, ditto, ventral; 2G, endophallus, ejaculatory duct complex, dorsal view; 2H, ditto, lateral; 2I, ditto, ventral; 2J, 8th sternite, ventral view; 2K, ditto, with 8th tergite in the background; 2L, 8th tergite, ventral view. Scale bar: 0.5mm for 2G-I; 1mm for the others.

Comparative notes. The new species can be distinguished externally by the pronotum. It is elongated, with sides uneven, densely, deeply punctate-verrucose. In addition, the upper eye-lobes are more widely separated from each other than usual. *Tethionea waigeona* Gressitt shares uniform body color and singly acuminose elytral apices with the new species. However, its pronotum is less strongly elongated and simply punctate on sides. The genitalia of the new species, including the ejaculatory duct complex, are essentially similar to those of already examined species of genera *Ceresium, Stenodryas, Examnes* and *Oxymagis*.

Tethionea unicolor Pascoe, 1869
(Figs 3A-E; 4A-L)

Tethionea unicolor Pascoe, 1869: 543. Type locality: "Aru".
Tethionea unicolor: Gemminger & Harold, 1872: 2838.
Tethionea unicolor: Aurivillius, 1912: 126.
Tethionea unicolor: Gressitt, 1951: 20.
Tethionea unicolor: Gressitt, 1959: 120, 121.
Tethionea unicolor: Slipiński & Escalona, 2016: 299

Material examined. ♂: "Gogol River, Madan, PNG, 10-20. iii. 1986, H. Makihara leg.

Additional description.

(Head, pronotum, elytra and legs as in the original description)

Terminal joints of maxillary palpi truncated and opened on both sides (Figs 11C-E).

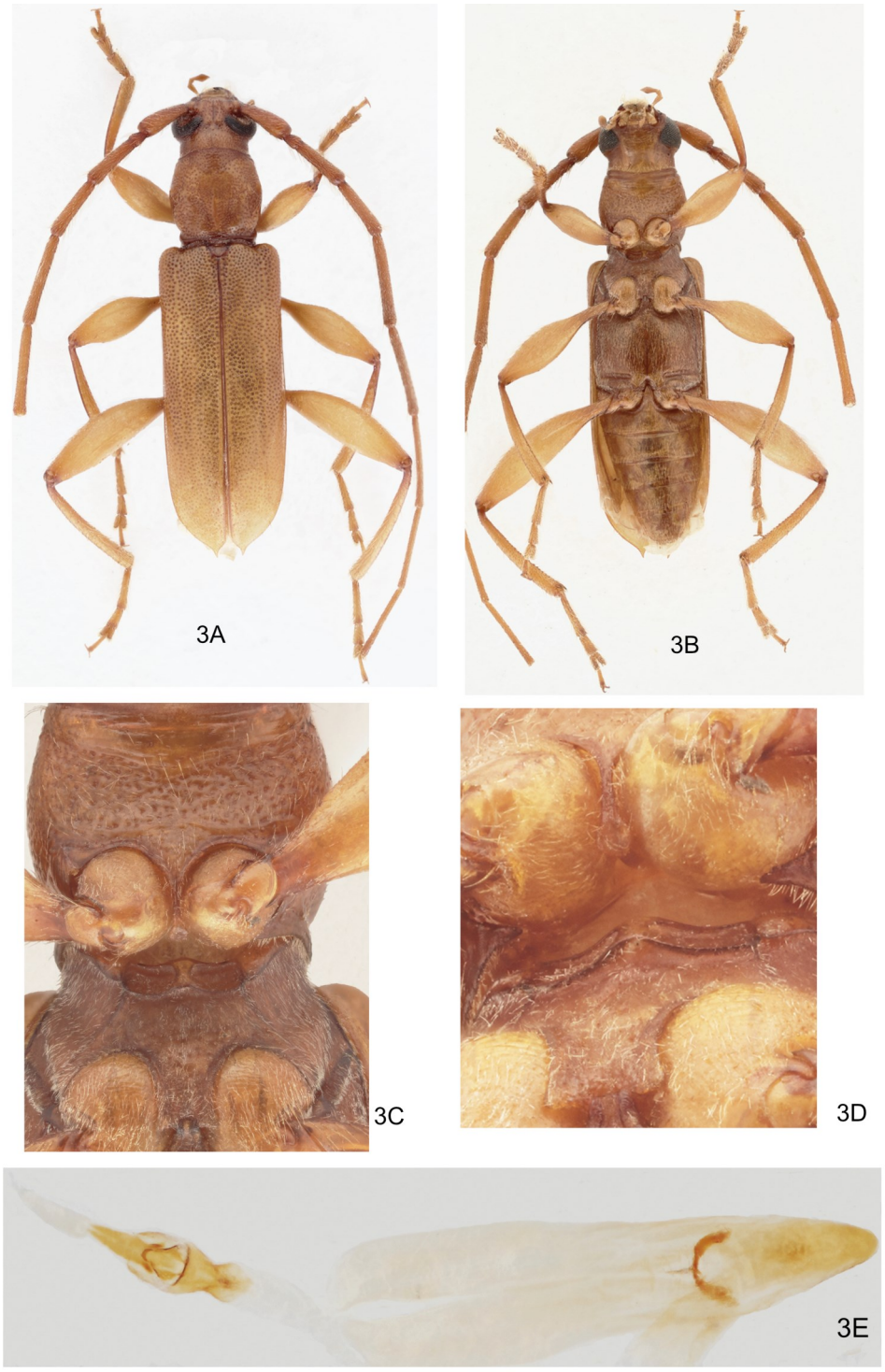
Venter. Prosternum transverse; sides rounded; the middle widely, horizontally impressed; setae sparse, fine, short, recumbent; apical 1/3 nitid, strigate; otherwise deeply punctate, partly rugose. Prosternal process well-bordered, narrow, constricted between the coxae; apex expanded, sub-truncated, impressed in the middle. Mesoventrite with sparse though large, deep punctures; setae short and sparse; moderately elevated toward the process. Mesoventral process sub-parallel-sided; apex moderately emarginated in the middle. Metaventrite transverse-sub-rectangular, convex, glossy, regularly provided with setiferous punctures each bearing a short recumbent hair.

Abdomen glossy, with sparse setiferous punctures; gradually narrowed toward apex; sternites 4-6 about half as long as the third; 7th about 2/3 as long.

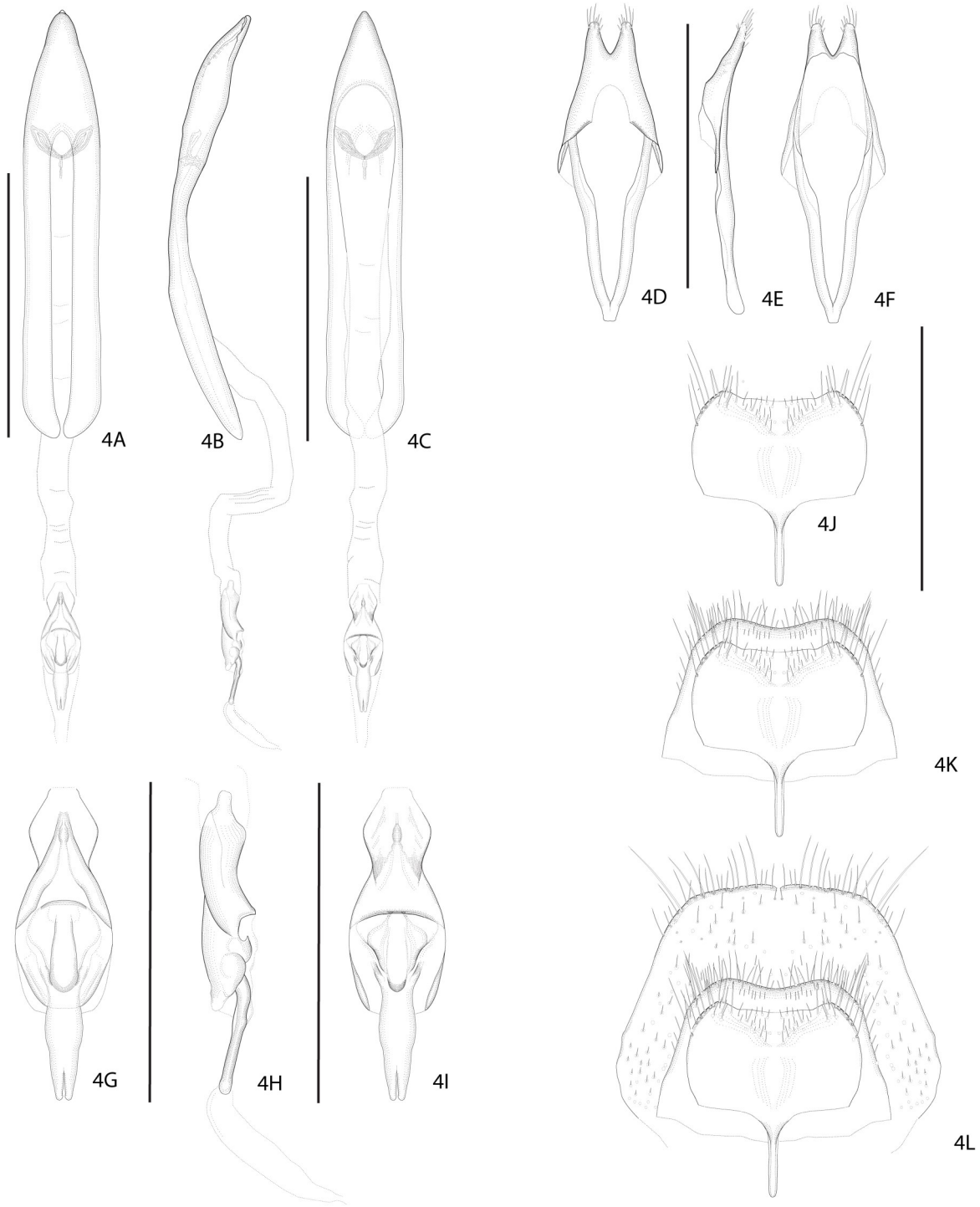
Male genitalia as Figs 3E; 4A-L. Median lobe about 2/5 the length of abdomen, bullet-shaped in dorsal view, narrow and weakly arcuate in lateral view; dorsal plate dehiscent in basal 7/10; ventral plate nearly as long, dehiscent in basal 4/5. Tegmen about 7/10 the length of median lobe, stout, feebly arcuate in lateral view. Parameres about half the length of tegmen, gradually tapering toward apex; apical 1/5 bi-lobed; each lobe with several stout apical setae. Ejaculatory duct complex as Figs 4G-I; about 3/10 as long as median lobe, stout, composed of three inter-connected sclerites; apical sclerite spatulate in dorsal view, thick; median sclerite stout, sub-toroidal in dorsal view, with a horn-shaped projection; basal sclerite elongated-spatulate, apically dehiscent. 8th sternite cotyledonary in outline; blade transverse, sub-emarginated on apex, a little thinned in the middle, fringed with several long apical setae, supplemented by shorter hairs in the apical middle; peduncle 3/4 as long as blade. 8th tergite sub-trapezoidal, broader than the sternite, moderately emarginated on apex; the latero-apical corners rounded; apical setae similar as those of the sternite. 7th tergite trapezoidal, much larger than 8th tergite; apex weakly arcuate.

Distribution. Aru, Northern Queensland, **Papua New Guinea** (**New Distribution)**.

Comparative notes. Compared to the holotype from Aru, no obvious difference in morphology was observed. The genitalia, including the ejaculatory duct complex, are essentially analogous to those of *Tethionea peggieae* sp. nov. With the new record of this species from Papua New Guinea, its distribution has become continuous between Aru and Queensland.



Figures 3A-E. *Tethionea unicolor* Pascoe. Male from Papua New Guinea. 3A, habitus, dorsal view; 3B, ditto, ventral; 3C, prosternum and mesoventrite; 3D, prosternal and mesoventral processes, ventral view, angled; 3E, median lobe and endophallus with ejaculatory duct complex, ventral view.



Figures 4A-L. *Tethionea unicolor* Pascoe. Male from Papua New Guinea. Genitalia. 4A, median lobe with endophallus, dorsal view; 4B, ditto, lateral view; 4C, ditto, ventral; 4D, tegmen, dorsal view; 4E, ditto, lateral; 4F, ditto, ventral; 4G, endophallus, ejaculatory duct complex, dorsal view; 4H, ditto, lateral; 4I, ditto, ventral; 4J, 8th sternite, ventral view; 4K, ditto, with 8th tergite in the background; 4L, ditto, with 7th tergite in the background. Scale bar: 0.5mm for 4G-I; 1mm for the others.

Tethionea strumosa Pascoe,1869
(Figs 5A-C; 6A-K)

Tethionea strumosa Pascoe, 1869: 544. Type locality: Ceram, Amboyna.
Tethionea strumosa: Gemminger & Harold, 1872: 2838.
Tethionea strumosa: Macleay, 1886: 202.
Tethionea strumosa: Aurivillius, 1912: 126.
Tethionea strumosa: Gressitt, 1951: 18, 19.
Tethionea strumosa: Gressitt, 1959: 190, 121.

Material examined. ♂: **"INDONESIA**; Irian Jaya, Freeport Concession, Timika. 18-25. VIII. 1997, R. Ubaidillah, Peggie" **97026"**. "Lowland r. forest, Kuala Kencana Light Ind. Park, 4. 2621' S. 136.5259' W. 100 m. Malaise trap 2 (Site 5)". "575".

Additional description.

(Head, pronotum, elytra and legs as in the original description)

The terminal joint of maxillary palp as in the original description (Fig. 11A).

Venter. Prosternum transverse, widely impressed in the middle, concave in profile; surface irregularly punctate, partly rugose-strigate; with an arcuate horizontal furrow stretching from side to side at apical 1/3; setae sparse, short, fine, recumbent. Prosternal process similar as of *T. unicolor*, though less strongly constricted. Mesoventrite sparsely, shallowly punctured; setae finer than on prosternum; the middle moderately elevated toward the process. Mesoventral process broad; the apical part sub-parallel-sided, twice vertically impressed. Metaventrite transverse-sub-rectangular, rounded; with regular, setiferous punctures each bearing a short recumbent hair.

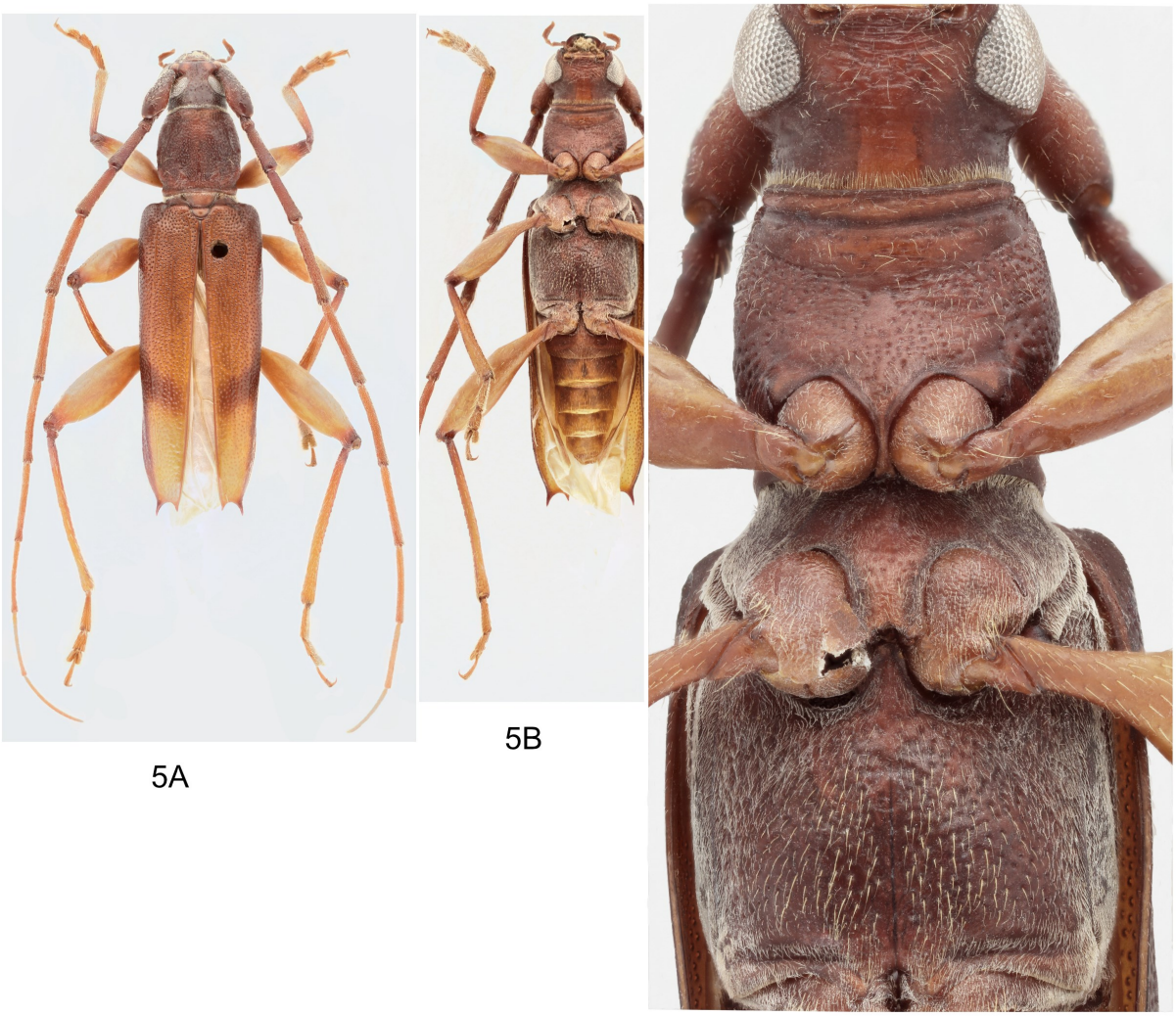
Abdomen glossy; sparsely provided with small, shallow, setiferous punctures; setae short and recumbent; sternites 4-7 gradually reducing in length and width.

Male genitalia as Figs 6A-K. Median lobe more than 2/5 the length of abdomen, bullet-shaped in dorsal view, arcuate in lateral view; dorsal plate dehiscent in basal 11/20; ventral plate longer, dehiscent in basal 4/5. Tegmen about 9/10 the length of median lobe, rather narrow in dorsal view, weakly arcuate in lateral view. Parameres about 9/20 the length of tegmen, gradually tapering toward apex; apical 1/4 bi-lobed; each lobe with several stout apical setae. Ejaculatory duct complex as Figs 6G-I; more than 1/3 the length of median lobe; composed of four inter-connected sclerites; apical sclerite slender, sub-annular in dorsal view, attached by a sclerotized appendage, which is slender, sharply bent downward and apically bi-lobed; median sclerite bifurcated, with a prominent, horn-shaped dorsal projection; basal sclerite composed of a pair of narrow, elongated flagella. 8th sternite cotyledonary in outline; blade rounded at the corners, strongly thinned in the middle, fringed with several long apical setae, supplemented by shorter ones in the apical middle; peduncle

about half the length of the blade. 8th tergite sub-trapezoidal with rounded corners, moderately emarginated on apex; apical half nearly as broad as the sternite; with several long setae along the apical margin.

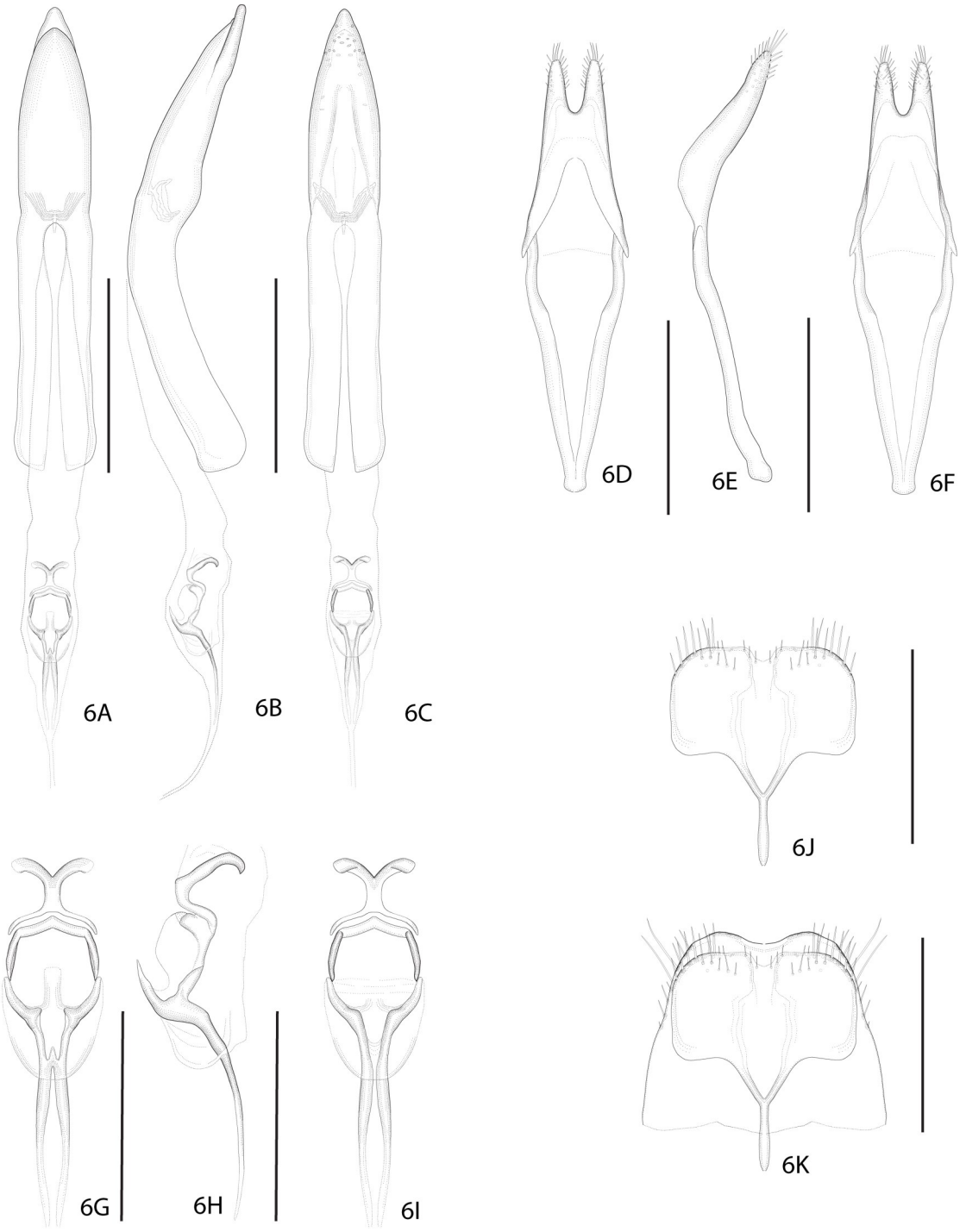
Distribution. Seram, Ambon, Waigeo, Papua Province (Indonesia); Fly River, New Britain, Goodenough (Papua New Guinea).

Comparative notes. Compared to the holotype from Maluku, no obvious difference in morphology was observed**.** The genitalia of *T. strumosa* are essentially analogous to those of the above two species. The ejaculatory duct complex is, however, one of the most intricate and delicate among the examined species. 8th tergite of this species resembles that of the above described *Tethionea unicolor*.



5A 5B 5C

Figures 5A-C. *Tethionea strumosa* Pascoe. Male from Papua New Guinea. 5A, habitus, dorsal view; 5B, ditto, ventral view; 5C, head and thorax, ventral view.



Figures 6A-K. *Tethionea strumosa* Pascoe. Male from Papua New Guinea. Genitalia. 6A, median lobe with endophallus, dorsal view; 6B, ditto, lateral view; 6C, ditto, ventral view; 6D, tegmen, dorsal view; 6E, ditto, lateral view; 6F, ditto, ventral view; 6G, endophallus, ejaculatory duct complex, dorsal view; 6H, ditto, lateral view; 6I, ditto, ventral view; 6J, 8th sternite, ventral view; 6K, ditto, with 8th tergite in the background. Scale bar: 0.5mm for 6G-I; 1mm for the others.

Tethionea tridentata Pascoe,1869
(Figs 7A-D; 8A-M)

Tethionea tridentata Pascoe,1869: 545. Type locality: Batchian.
Tethionea tridentata: Gemminger & Harold, 1872: 2838.
Tethionea tridentata: Aurivillius, 1912: 126.
Tethionea tridentata: Mckeown, 1947: 48.
Tethionea tridentata: Gressitt, 1951: 19.
Tethionea tridentata: Gressitt, 1959: 119, 121.
Tethionea tridentata: Vives, Aberlenc & Sudre, 2008: 140 ; fig. 2b.
Tethionea tridentata: Ślipiński & Escalona, 2016: 299.

Material examined. ♂: "Gogol River, Madan, PNG, 10-20.iii.1986, H. Makihara leg.

Additional description.
(Head, pronotum, elytra and legs as in the original description)

The terminal joint of maxillary palp as in the original description. (Fig. 11B).

Venter. Prosternum similar as of *T. unicolor*, though the middle more sparsely punctate-rugose; prosternal process similar. Mesoventrite with the process also similar. Metaventrite transverse, feebly dilated toward apex, well convex, glossy, regularly punctate; punctures setiferous near middle; setae short and recumbent.

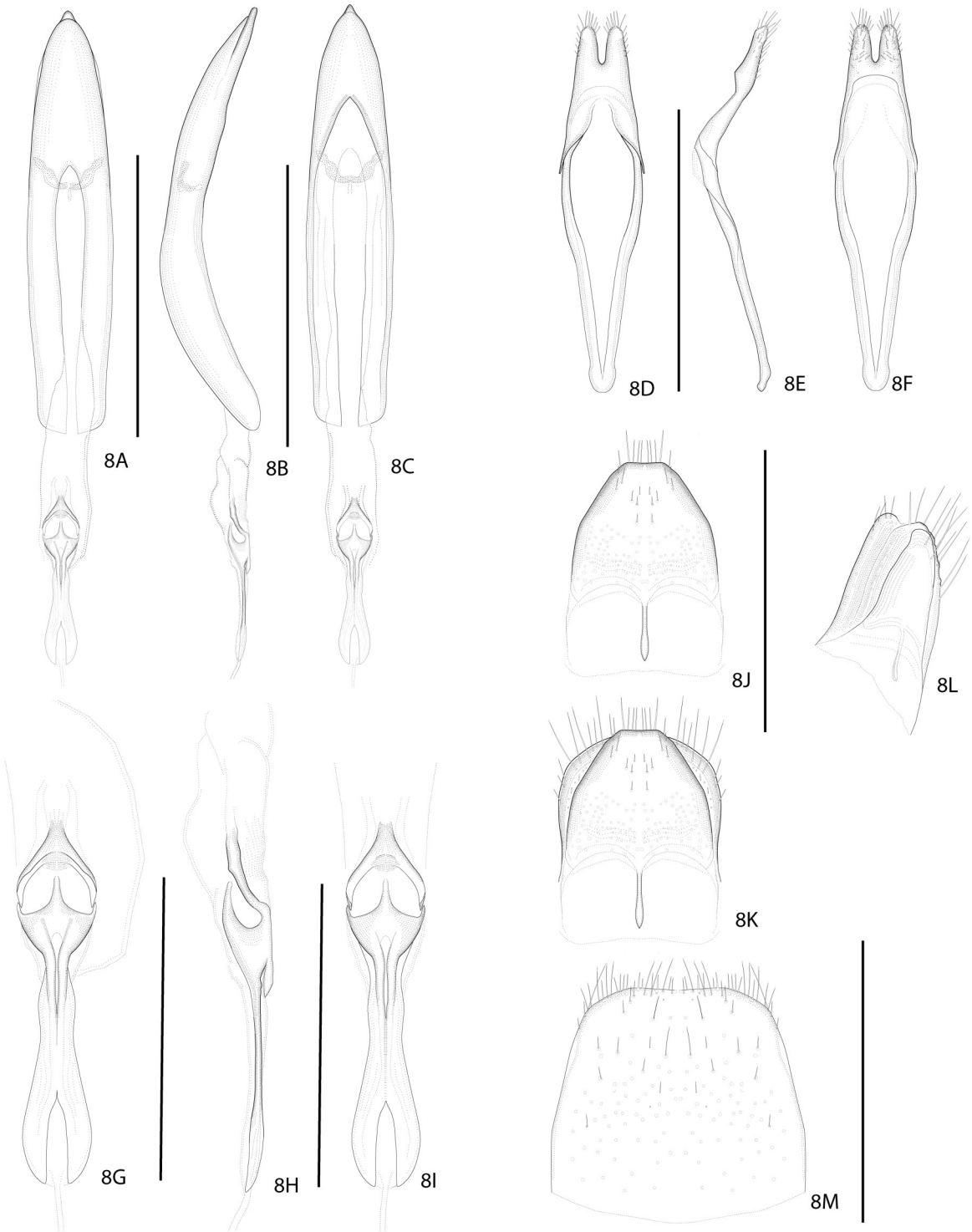
Abdomen glossy; with sparse, small, shallow, setiferous punctures; several setae thereof curved, longer than the others. Sternites 4-7 gradually reducing in length and width.

Male genitalia as Figs 7D; 8A-M. Median lobe nearly 9/20 the length of abdomen, bullet-shaped in dorsal view, arcuate in lateral view; dorsal plate dehiscent in basal 2/3; ventral plate longer, dehiscent in basal 7/9. Tegmen about 8/9 the length of median lobe, rather narrow in dorsal view, arcuate in ventral view. Parameres about 2/5 the length of tegmen, gradually tapering toward apex; apical 1/4 bi-lobed; each lobe with several stout apical setae. Ejaculatory duct complex as Figs 7D; 8G-I; more than 1/3 the length of median lobe; composed of three inter-connected sclerites; apical sclerite in dorsal view spatulate-sub-triangular with base emarginated, arcuate in lateral view; median sclerite stout, with a horn-shaped projection; basal sclerite elongated-spatulate, apically expanded and deeply dehiscent. Blade of 8th sternite hexagonal; apical half trapezoidal; basal half parallel-sided; base thinned; apex fringed with several stout setae; supplemented by several short ones near the middle; peduncle about half the length of blade. 8th tergite sub-circular, as broad as the sternite at base, connected to the sternite with a thick membranous structure (Fig. 8L). 7th tergite trapezoidal, much larger than the 8th tergite, fringed with a line of apical hairs.

Distribution. Bacan, Waigeo, Yapen (Indonesia); Madang, New Britain (Papua New Guinea); Malaita, Vanikoro (Solomon Is.); Queensland (Australia).

Comparative notes. Compared to the holotype from Maluku, no obvious difference in morphology was observed. The genitalia of the new species resemble those of the above observed species. However, its 8th sternite is remarkable. In particular, the blade is projected forward to form an unusual trapezoidal outline. The peduncle is exceptionally short in comparison to the blade. This type of 8th sternite has been so far observed neither in the genus nor in the related genera.

Figures 7A-D. *Tethionea tridentata* Pascoe. Male from Papua New Guinea. 7A, habitus, dorsal view; 7B, ditto, ventral view; 7C, thorax, ventral view; 7D, median lobe and endophallus with ejaculatory duct complex, lateral view.



Figures 8A-M. *Tethionea tridentata* Pascoe. Male from Papua New Guinea. Genitalia. 8A, median lobe with endophallus, dorsal view; 8B, ditto, lateral; 8C, ditto, ventral; 8D, tegmen, dorsal view; 8E, ditto lateral view; 8F, ditto, ventral; 8G, endophallus, ejaculatory duct complex, dorsal view; 8H, ditto, lateral; 8I, ditto, ventral; 8J, 8th sternite, ventral view; 8K, ditto, with 8th tergite in the background; 8L, ditto, latero-dorsal view, angled; 8M, 7th tergite, dorsal view. Scale bar: 0.5mm for 8G-I; 1mm for the others.

Tethionea oculata sp. nov.
(Figs 9A-E; 10A-H)

Material examined. Holotype ♀: **"INDONESIA**, Irian Jaya, Freeport Concession Timika, 12-19. IX. 1997, R. Ubaidillah, Peggie **97032"**; "Lowland r. forest, Kuala Kencana Light Ind. Park, 4. 2621' S. 136.5259' W. 100 m. Malaise trap 2 (Site 5)"; "336". Paratype ♀: "Pandans peat swamp, East levee of Minajerwi River, 4. 4099'S. 136.5854'W. 15 m. Malaise trap-1 (Site 4)"; "7702".

Diagnosis. Testaceous; glossy. Eyes large; much more approximate to each other than usual. Pronotum elongated, regularly punctate. Prosternal process strongly constricted and terminated between pro-coxae. Elytral apices each terminated with an acuminate spine; the sutural side sub-linear.

Etymology. The name of this new species refers to its large eyes.

Description.

Measurements. Ble=10.0-8.2mm. EL/EW=3.0-2.85. HW/PW=1.0. PL/PW=1.12. PA/PW=0.72-0.7. PB/PW=0.8. (First figure for the holotype, when two figures given).

Color testaceus; antennae and legs a little paler; setae yellowish.

Head as Figs 9C-E. Glossy, glabrous. Occiput, vertex and upper half of frons regularly, deeply, though sparsely punctured. Frons deeply emarginated on sides by lower eye-lobes; with a median groove. The terminal joint of maxillary palp spatulate, with the external side moderately truncated and opened. Vertex broad, widely flattened, feebly concave in the middle. Eyes large; upper eye-lobes separated from each other by 3/2 the width of apical lobe or less than 3/10 the width of occiput. Antennal supports flattened. Antennae nearly reaching the elytral apices. Scapes weakly clavate and arcuate; each with a few large setiferous punctures. Antennomeres 3, 4, 5, 6 each 19/20, 9/10, 12/10, 11/10 as long as scape; 7-11 a little shorter.

Pronotum longer than broad, almost hairless, glossy, regularly and densely punctured; apex and base moderately constricted. Sides evenly arcuate; surface uneven with a few irregular protuberances. Disc with a nitid median stripe half the length of pronotum. Scutellum bell-shaped, strongly bordered.

Elytra moderately long; sides sub-parallel-sided in basal 4/5; apices each terminated with an acuminous spine; the sutural side of the spine sub-linear or feebly emarginated. Each elytron regularly, densely punctured; with several erect, stout hairs toward apex.

Legs rather long and slender. Femora moderately clavate from base on; a little flattened.

Venter. Prosternum glossy; concave in profile, horizontally impressed in the middle; deeply, coarsely punctate-rugose there, with several fine hairs. Prosternal process apically

9A

9B

9C

9D

9E

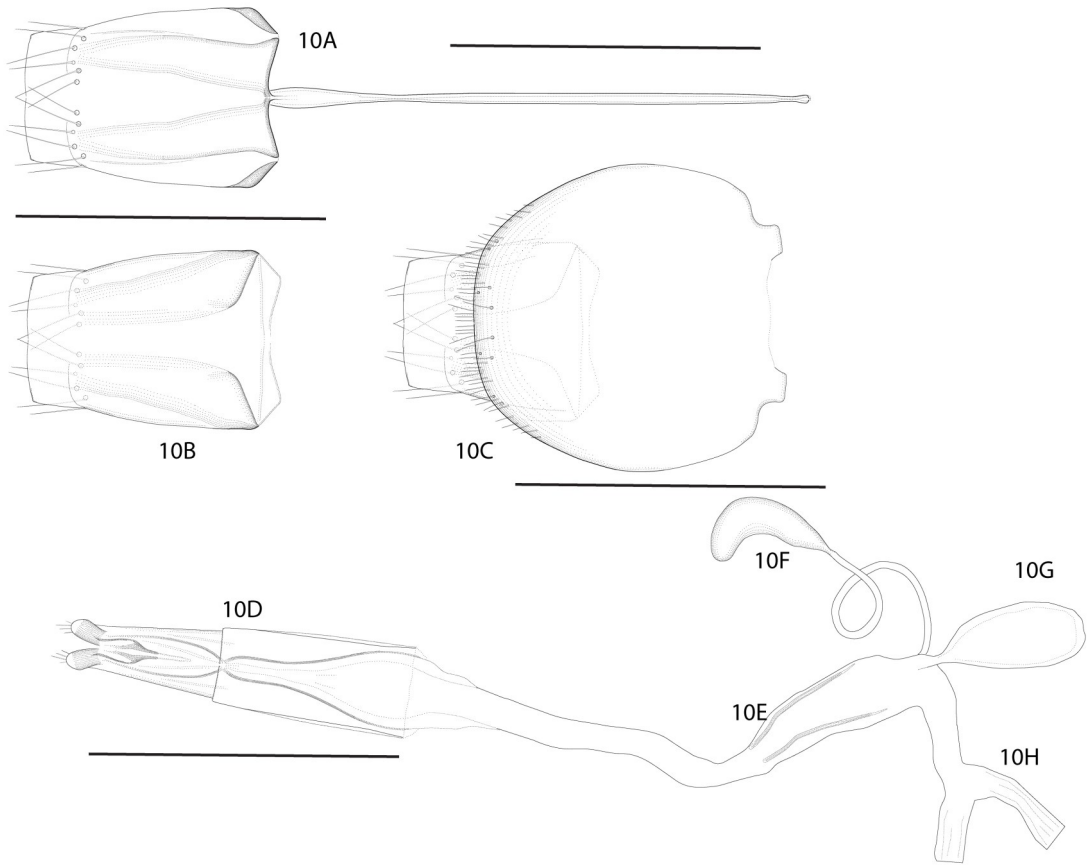
Figures 9A-E. *Tethionea oculata* sp. nov. Holotype female. 9A, habitus, dorsal view; 9B, ditto, ventral view; 9C, head; 9D, head and pronotum, lateral view; 9E, head and thorax, ventral view.

reduced, acutely terminated between procoxae. Mesoventrite similar to that of *T. strumosa*. Mesoventral process also similar, though a little narrower. Metaventrite transverse-sub-rectangular, well rounded; glossy, with large, regular though sparse punctures, which are more or less setiferous in the middle.

Abdomen glossy; with sparse setiferous punctures; sternites 4-6 gradually reducing in length and width. 7th sternite sub-trapezoidal, distinctly longer than the 6th. 7th tergite sub-circular, fringed with short apical setae (Fig. 10C).

Female genitalia as Figs 10A-H. Blade of 8th sternite sub-trapezoidal, longer than broad; apical part prolonged with a membranous structure; clothed with several medium-sized stout hairs on an arcuate horizontal line at apical 1/5; peduncle about 5/2 as long as blade. 8th tergite with latero-basal corners produced and moderately acute. 9th sternite rather short; coxite a little shorter than paraproct; styli stout, each with several short hairs. Vaginal plates elongated, arcuate-flagellar. Bursa copulatrix oval. Spermatheca kidney-shaped, connected to apical vagina with a long duct.

Distribution. Papua Province (Indonesia).



Figures 10A-H. *Tethionea oculata* sp. nov. Holotype female. Genitalia.10A, 8th sternite, ventral view; 10B, 8th tergite, ventral view; 10C, 7th tergite with 8th tergite in the background, dorsal view; 10D, 9th sternite; 10E, vaginal plates; 10F, spermatheca; 10G, bursa copulatrix; 10H, median oviduct. Scale bar: 1mm.

Comparative notes. *Tethionea oculata* sp. nov. can be distinguished by its large eyes, which are much more approximate to each other than usual. In addition, its prosternal process is terminated instead of expanded toward apex. In other respects, it is most comparable to *Tethionea waigeona* Gressitt, 1955, and *Tethionea tenuimembris* Gressitt, 1951.

DISCUSSION

Male genitalia of *Tethionea* species. Endophalli of altogether four species, *T. peggieae* sp. nov., *T. unicolor*, *T. strumosa* and *T. tridentata* were investigated for this publication. In each of these species, the characteristic apical sclerotization, referred to as "ejaculatory duct complex", was identified. *Tethionea* is thus the fifth genus of the tribe observed with this type of endophallus, after *Ceresium*, *Examnes*, *Stenodryas* and *Oxymagis* (Yokoi, 2019; 2021a; 2021b; 2022 in press; Yokoi et al., 2019). The ejaculatory duct complexes of the examined *Tethionea* species are relatively large, 3/10 to 1/2 as long as median lobe, whereas their structures are among the most intricate of the examined genera. Regarding the other genital organs, no essential difference from the above four genera was observed.

The 8th sternites of the examined male species are mostly broad and stout. In three species, *T. peggieae* sp. nov., *T. strumosa* and *T. tridentata*, they are as broad as or nearly as broad as the 8th tergite. 8th sternite of *T. tridentata* differs markedly from these species. The elongated hexagonal outline with extremely short peduncle is unusual even as a species of the Callidiopini.

Maxillary palpi. In the original descriptions of *T. strumosa* and *T. tridentata*, both male, Pascoe observed that the terminal joints of their maxillary palpi are "rather singular", "the truncate slope commencing nearly from base, so that the greater part of the joints appear to be removed" (Pascoe, 1869). This observation is now confirmed for these two species, as described and illustrated above (Figs 11A–B). In this regard, it should be noted that a third species, *Tethionea unicolor*, is also distinct, though in a different way; the terminal joints of its maxillary palpi are truncated on both sides (Figs 11C–E). *Tethionea peggieae* sp. nov. is also distinct. The terminal joints of its palpi are simply and moderately truncated (Fig. 11F), but this type of maxillary palp is rather commonly observed in various genera of the tribe. The type of maxillary palpi observed by Pascoe is not shared by all the members of *Tethionea*. His hypothesis that "it is very probably characteristic of the genus" is not confirmed.

Later, Gressitt (1955) presented a comprehensive illustration of maxillary palpi, and described, in particular, those of *Tethionea bidentata* Gressitt, *Tethionea bicolo*r Gressitt

and *Tethionea waigeona* Gressitt, all male, concluding that the genus is characterized, among others, by "last maxillary palpal segment with one or two cavities". This statement is essentially valid for the hitherto examined species, so long as furrows, openings and truncated sections are interpreted as various forms of cavities.

Regarding the female apical palp, Pascoe noted that it is "cylindrical or only slightly triangular". *Tethionea oculata* sp. nov. does not correspond to this observation, as the joint is obviously truncated, though only moderately (Fig. 11G).

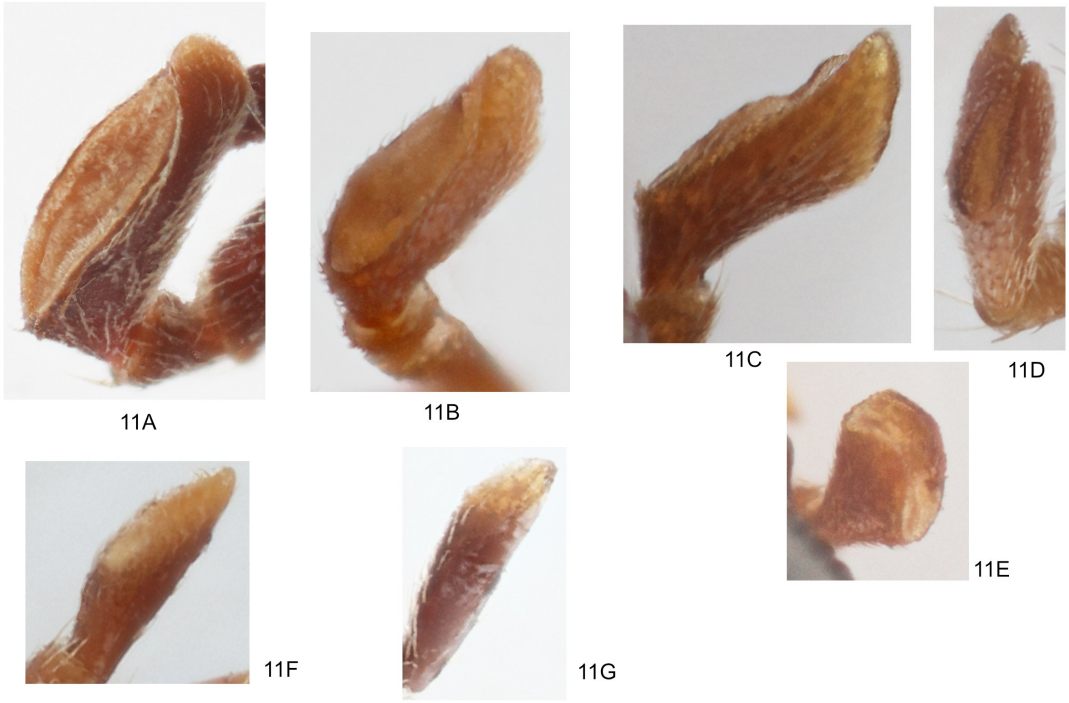
Prosternal processes. The structure of prosternal processes is variable among the five examined species of *Tethionea*. The process is obviously expanded toward apex in *T. unicolor*, *T. tridentata* and *T. strumosa,* while moderately so in *T. peggieae* sp. nov. In contrast, it is terminated between the procoxae in *T. oculata.* This observation does not correspond to the description by Ślipiński and Escalona (2016). Additional species should be observed for a valid general statement.

Tethionea oculata sp. nov. In a few respects, this species is singular among the examined *Tethionea* species. Its eyes are exceptionally large. Their upper lobes are more approximate to each other than usual. The same is valid for the lower eye-lobes. Further, its prosternal process is terminated between pro-coxae, in contrast to those of the other species. The male genitalia of this species should be investigated.

Prospect. Besides the above *T. oculata* sp. nov., several other *Tethionea* species are atypical.

T. pubescens Gressitt, *T. squamata* Gressitt, *T. subcallosa* Gressitt, all three from New Guinea, each with unusual integument, are such examples. *T. brevicollis* Gressitt from New Guinea and *Tethionea minima* Vives from the Philippines differ in the structure of head and pronotum. Further, antennae and legs of *Tehionea bicincta* Fauvel from New Caledonia are distinct. These species should be examined as to their positions in the genus. Moreover, some species of other genera resemble *Tethionea* species in a way or another, particularly of *Semiope* Pascoe,1869, from New Guinea and of *Notoceresium* Blackburn, 1901, from Australia and New Guinea. Of the widely distributed *Ceresium*, its subgenus *Ceresium (Ceresiellum*) Gressitt, 1956, from Micronesia and Fiji, should be examined regarding its affinity to *Tethionea.*

Male genitalia of these species, essential keys for their taxonomy, should be carefully examined. Regrettably, many pivotal species are still not available to the authors. Contributions by colleagues are welcome.



Figures 11A-G. *Tethionea* species. Terminal joint of maxillary palp. 11A, *T. strumosa* (male); 11B, *T. tridentata* (male); 11C, *T. unicolor* (male); 11D, ditto, external side; 11E, ditto, apical view; 11F. *T. peggieae* sp. nov. (male); 11G, *T. oculata* sp. nov. (female).

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