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New species of *Laxotela* Winterton & Irwin from Australia (Diptera: Therevidae: Agapophytinae)

SHAUN L. WINTERTON
Queensland Department of Primary Industries & Fisheries, Indooroopilly, Queensland, Australia.
e-mail: wintertonshaun@gmail.com

Abstract

Two new species of the endemic Australian stiletto fly genus *Laxotela* Winterton & Irwin are described and figured. *Laxotela elongata* **sp. nov.** is described from Queensland while *Laxotela plata* **sp. nov.** is described from south-eastern mainland Australia. *Laxotela ornata* (Kröber) **comb. nov.** (originally *Spatulipalpa* Kröber) was recently placed as *incertae sedis* within Therevidae, but is herein transferred to *Laxotela*. A revised key to *Laxotela* species is presented.

Key words: Stiletto fly, Asiloidea

Introduction

The dominant subfamily of stiletto flies in Australasia are Agapophytinae, comprising 11 genera with *ca.* 100 described and more than 200 undescribed species (Winterton *et al.* 2001), and representing at least half the therevid biodiversity in the region. If the *Taenogera* genus-group (*sensu* Winterton *et al.* 1999b) is also included within Agapophytinae, as suggested by Winterton (2006), then this number will increase to at least 25 genera with more than 500 species in Australasia and South America, and would represent about a third of the total number of Therevidae species world-wide. As presently defined by Winterton *et al.* (2001), Agapophytinae *sensu stricto* includes the genera *Acatopygia* Kröber, *Acraspisa* Kröber, *Acraspisoides* Hill & Winterton, *Acupalpa* Kröber, *Agapophytus* Guérin, *Belonalys* Kröber, *Bonjeania* Irwin & Lyneborg, *Laxotela* Winterton & Irwin, *Parapsilocephala* Kröber, *Patanothrix* Winterton and *Pipinnipons* Winterton. These genera are restricted to Australia, Papua New Guinea and the eastern provinces of Indonesia, although no single genus is recorded from all three regions (Winterton *et al.* 2001).

Laxotela is a distinctive genus closely related to *Belonalys* (Winterton & Irwin 1999). Both genera have velutum patches on the fore and hind femora and gonocoxites, open wing cell m_3, and males have an enlarged ventral lobe on the genitalia. Winterton & Irwin (1999) described *Laxotela* with five constituent species, *L. gaimarii* Winterton & Irwin, *L. hauseri* Winterton & Irwin, *L. holstoni* Winterton & Irwin, *L. metzi* Winterton & Irwin and *L. whitei* Winterton & Irwin. In their phylogenetic revision of Agapophytinae using both molecular and morphological data, Winterton *et al.* (2001) diagnosed *Laxotela* again and placed it with *Belonalys* as an intermediate clade sister to *Agapophytus*+(*Pipinnipons*+*Acupalpa*). *Laxotela* has a distinct southern, or Bassian, distribution in Australia with the most northerly record being collections of *L. gaimarii* and *L. metzi* from Carnarvon National Park in Central Queensland.

The genus *Spatulipalpa* Kröber was originally described by Kröber (1912) containing two species, *S. ornata* Kröber and *S. paradoxa* Kröber. *Spatulipalpa paradoxa* was subsequently designated the type species of *Spatulipalpa* by Irwin & Lyneborg (1989) and transferred to *Acatopygia*, thus synonymising the genus. *Spatulipalpa ornata* Kröber was not transferred to *Acatopygia*, but instead was left *incertae sedis* within Ther-

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evidae by Irwin & Lyneborg (1989). This species is known only from the original description as the type specimen, deposited in the Hungarian National Museum of Natural History, was apparently destroyed (pers. com., M. Foldvari). Based on the description it is clear that this species likely belongs to the genus *Laxotela*.

In this paper, two new species of *Laxotela*, *L. elongata* **sp. nov.** and *L. plata* **sp. nov.**, are described and figured. *Laxotela ornata* (Kröber) **comb. nov.** is recognised based on the original description alone, as no specimens are known to exist. A revised key to species of *Laxotela* is presented in light of the new species described herein.

Materials and Methods

Terminology for wing venation follows McAlpine *et al.* (1981) and Irwin & Lyneborg (1981) and genitalic morphology as modified by Winterton *et al.* (1999a, b) and Winterton (2006). As discussed in Winterton (2006), this paper also follows Hauser & Irwin (2003) in the use of the term pubescence *sensu* Nichols (1989) instead of pruinescence to describe microtrichia covering the adult body.

Genitalia were macerated in 10% KOH at room temperature for one day to remove soft tissue, then rinsed in distilled water and dilute glacial acetic acid, and dissected in 80% ethanol. Female reproductive organs were stained with a saturated solution of Chlorazol Black in 40% ethanol. Genitalia preparations were placed in glycerine in a genitalia vial mounted on the pin beneath the specimen.

Types are deposited in the Queensland Museum (QMBA) and Queensland Department of Primary Industries and Fisheries (QDPI) insect collections in Brisbane, and the Australian National Insect Collection (ANIC) in Canberra, Australia. Numbers quoted with individual specimens as MEI ###### are unique identifiers in the therevid database MANDALA and are attached to each specimen as a yellow label (Kampmeier *et al.* 2004).

Taxonomy

Laxotela ornata (Kröber) **comb. nov.** is recognised here based on colouration and markings given in the original description by Kröber (1912). The type specimen is destroyed and no other specimens are known to exist. Characteristics that indicate placement in *Laxotela* include the banded and mottled wing, wing cell m_3 open, and the distinctive scutal and scutellar markings similar to that in other *Laxotela* species. This species is described as having black antennae and mouthparts, postocular setae black, and wing banded as in *Acatopygia paradoxa*, but with hyaline areas also mottled (Kröber 1912). The scutum has a distinctive matte, white patch of pubescence that is triangular shaped, with three narrow processes or stripes posteriorly. Lateral areas and posterior third of the scutum are overlain with matte, black pubescence, as is the scutellum. These markings and colouration are not identifiable in any other Australian therevid examined by the author and this species appears not represented in collections at this time.

The new species of *Laxotela* described herein can be identified using the following key modified after Winterton & Irwin (1999). *Laxotela ornata* **comb. nov.** is not included in the key as male genitalic characters are not available, but the scutal markings and wing pattern identify this species as likely closely related to *L. plata* **sp. nov.** and *L. holstoni*.

Key to *Laxotela* species

1. Wing extensively mottled or banded; scutum either mottled matte black and silver pubescence, or dark with pale dorsocentral stripes; male distiphallus narrow apically (Figs 2G, 3G) 2

- Wing largely hyaline or uniform smoky infuscate; scutum grey, patterned with dark brown tessellate or interrupted stripes; male distiphallus ornately shaped apically (Winterton & Irwin 1999, figs 2F–G, 5F–G) 6

2. Scutum patterned with silver, matte black and brown pubescence; epandrium width equal to length along midline; ventral apodeme extending anteriorly to approximately half the length of ejaculatory apodeme (Fig. 2G) 3
- Scutum patterned otherwise, often dark with pale dorsocentral stripes; epandrium elongate; ventral apodeme of parameral sheath extending anteriorly to approximately end of ejaculatory apodeme (Fig. 3G) ..4

3. Male frons with elongate setae; male abdomen covered with silver velutum; mid and hind tibia with pale setae; slender species .....*plata* **sp. nov.**
- Male frons with short setae; male abdomen lacking silver velutum; tibia with black setae; more robust species.....*holstoni* Winterton & Irwin

4. Male and female abdomen with extensive areas of silver velutum (not completely covering abdomen); scutum patterned as in Figure 1, without distinct pale dorsocentral stripes; aedeagus with large lateral flanges on basal portion of distiphallus (Figs 2F–G).....*elongata* **sp. nov.**
- Abdomen of male and female without extensive silver velutum covering; aedeagus without flanges or lateral projections on distiphallus (Winterton & Irwin 1999, figs 3E–F, 6F–G) 5

5. Femora pale orange, darkened apically; gonocoxal apodeme shorter than gonocoxite; gonocoxal process shorter than gonostylus; dorsal apodeme of parameral sheath enlarged (Winterton & Irwin 1999, figs 6A–G) .....*whitei* Winterton & Irwin
- Femora black; gonocoxal apodeme length 3/4 of gonocoxite length; gonocoxal process longer than gonostylus; dorsal apodeme reduced (Winterton & Irwin 1999, figs 3A–F) .....*hauseri* Winterton & Irwin

6. Male frons wider than ocellar tubercle; patch of dark setae below eye in both sexes; male abdomen with silver velutum; ventral lobe of gonocoxite acuminate, longer than gonostylus (Winterton & Irwin 1999, figs 2A–I).....*gaimarii* Winterton & Irwin
- Male frons narrower than ocellar tubercle; setae below eye pale in both sexes; male abdomen without velutum; ventral lobe of gonocoxite notched apically, shorter than gonostylus (Winterton & Irwin 1999, figs 5A–G) ..... *metzi* Winterton & Irwin

***Laxotela elongata* sp. nov.**
(Figures 1–2)

Holotype male, AUSTRALIA: QUEENSLAND: Beerburrum, 26°58’S, 152°58’E, 18.viii.1991, R. Eastwood (MEI 165133) (Type#: T.144010) (QMBA).

FIGURE 1. *Laxotela elongata* **sp. nov.**, female. Body length= 8.5 mm. Photo by Shaun L. Winterton.

Paratype

AUSTRALIA: QUEENSLAND: female, Brisbane, Slaughter Falls, base of Mt. Coot-tha, 20.viii.2005, 27°28.41'S, 152°58.19'E, S.L. Winterton, hand net (MEI 165134) (QDPI).

Diagnosis

Wing banded, but with infuscate areas mottled; antennae slightly elongate, positioned on raised lower frons; silver velutum patches on abdominal tergites 1–5; hind femur and tibia bowed; distiphallus with lateral flanges.

Description

Male. Body length: 8.0 mm.

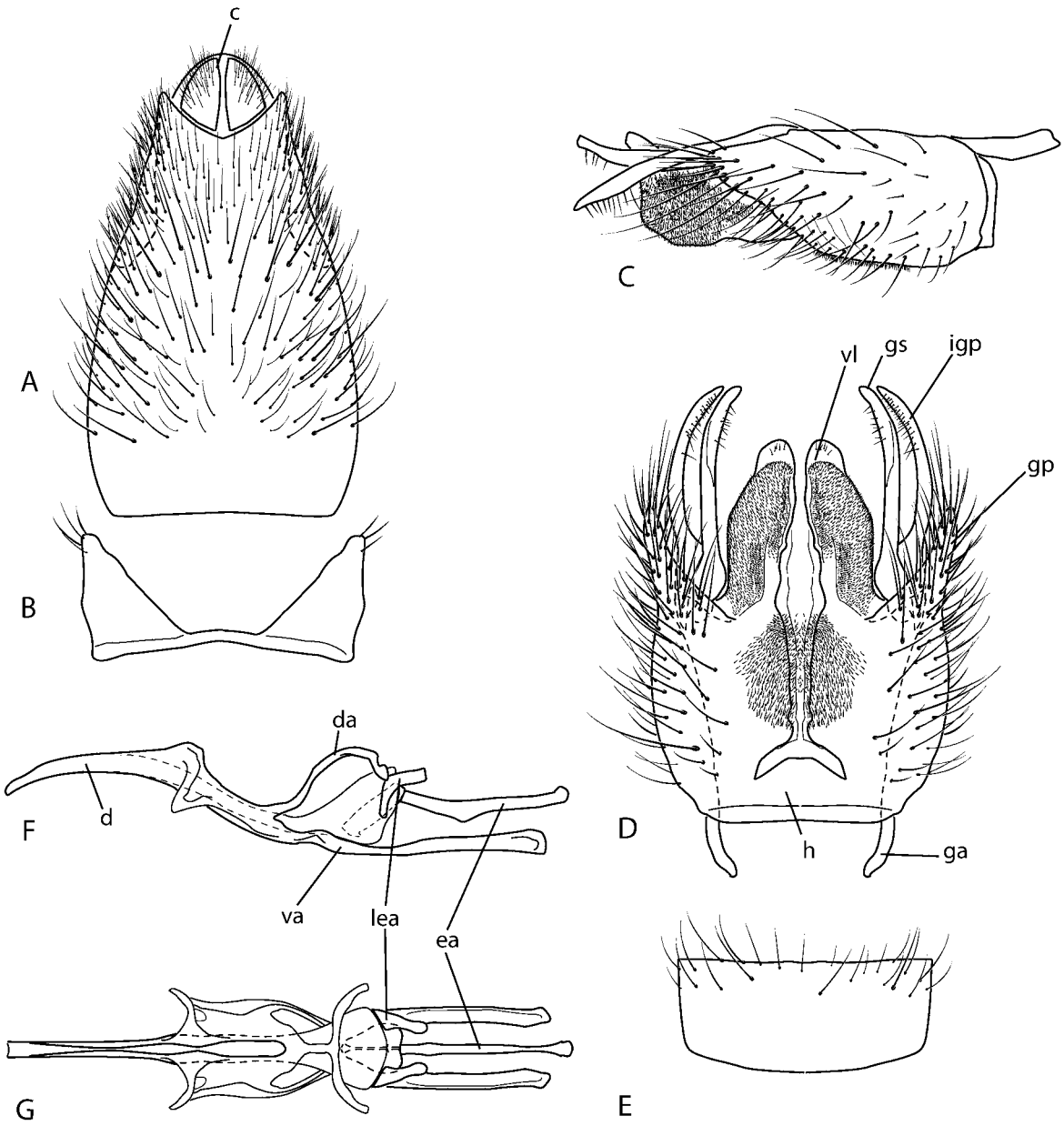

FIGURE 2. *Laxotela elongata* **sp. nov.**, Male genitalia: A, epandrium, dorsal view; B, tergite 8, dorsal view; C, gonocoxites lateral view; D, same, ventral view; E, sternite 8, ventral view; F, aedeagus, lateral view; G, same, dorsal view. Abbreviations: *c*, cercus; *d*, distiphallus; *da*, dorsal apodeme of parameral sheath; *ea*, ejaculatory apodeme; *ga*, gonocoxal apodeme; *gp*, gonocoxal process; *gs*, gonostylus; *h*, hypandrium; *igp*, inner gonocoxal process; *lea*, lateral ejaculatory apodeme; *va*, ventral apodeme of parameral sheath; *vl*, ventral lobe. Scale line= 0.5 mm.

Head. Longer than high; frons width equal to ocellar tubercle at narrowest point, antennal base positioned low on protruding lower frons, frons concave midway and raised dorsally, frons smooth, overlain with dense black-silver pubescence admixed with elongate dark setae, glossy brown (without pubescence) above antennal bases and on face, narrow strip of silver pubescence extending from mouthparts to eye below level of antennae; ocellar tubercle slightly raised, black, overlain with dark grey pubescence; occiput flat to slightly convex marginally, black, overlain with light grey-brown pubescence, single row of relatively long, black postocular setae dorsally; gena smooth, glossy black on lower portion, overlain with dense light grey pubescence dorsally, admixed with long, white setae; palp and labellum brown with scattered pale setae; antennae relatively elongate, approximately equal to head length, dark brown, flagellum overlain with brown-grey pubescence, numerous elongate setae on scape, pedicel, and base of flagellum.

Thorax. Brown-black; scutum overlain with patterned brown, grey and black pubescence, darker posteriorly, uniformly admixed with fine, dark setae; scutal macrosetae (bristles) black; scutellum overlain with bronze and black pubescence; pleuron and mid and hind coxae black, covered with dense grey pubescence, fore coxa dark yellow-brown to black; elongate pale setae on anepisternum, katepisternum, katatergite and coxae; femora dark yellow, tibia dark yellow–brown, tarsi dark brown-black, hind femur distinctly bowed anteriorly, slightly bulbous around area of velutum patch; hind tibia distinctly bowed posteriorly; wing hyaline with distinct black banding with infuscate areas mottled; venation brown; haltere brown, knob white apically; scutal chaetotaxy (pairs): notopleural (np), 3; supra alar (sa), 1; post-alar (pa), 1; dorso-central (dc), 2; scutellar (sc), 1.

Abdomen. Black, extensive silver velutum on segments 1–5, anterior portion of tergites 1–5 bronze-brown pubescent, anterior margin of sternites 2–4 black; sparse elongate pale setae on all segments, longer laterally; terminalia brown.

Male genitalia. Terminalia dark, setae pale; epandrium elongate, narrowed posteriorly with posterolateral edges rolled under, setae dense along this margin (Fig. 2A); cercus rounded; tergite 8 emarginate medially (Fig. 2B); gonocoxal process shorter than inner gonocoxal process (Figs 2C–D); gonostylus and inner gonocoxal process slender, curved along length; ventral lobe 1/4 length of gonostylus, quadrangular with narrowed apices; velutum present on most of ventral lobe and along medial edge of gonocoxite; gonocoxal apodeme 1/4 length of gonocoxite; sternite 8 quadrangular (Fig. 2E); distiphallus narrow, elongate with large lateral flanges (Figs 2F–G), posterior margin of flanges curved dorsally and laterally, wing-like; dorsal apodeme of parameral sheath 'T'-shaped; ventral apodeme equal length to ejaculatory apodeme; lateral ejaculatory apodeme elongate, projecting anteriorly.

Female. Body length 8.5 mm.

Similar to male except: frons only slightly wider than in male; legs black.

Female genitalia. Genitalia not dissected.

Etymology

The specific epithet is derived from the Latin adjective, *elongatus*; referring to the elongate body shape of this species.

Comments

Only a single male and female are known. This species is found in late winter in south-eastern Queensland. *Laxotela elongata* **sp. nov.** is closely related to *L. whitei* and *L. hauseri*. This group of species is characterised by a distinctly elongate body shape and narrow aedeagus with a ventral apodeme of the parameral process extending anteriorly approximately equal to the length of the ejaculatory apodeme.

***Laxotela plata* sp. nov.**
(Figure 3)

Holotype male, AUSTRALIA: SOUTH AUSTRALIA: Mt Barker (summit), Mar–Apr.1968, A.D. Austin, M[alaise]/trap (MEI 16576) (ANIC).

Paratypes, AUSTRALIA: SOUTH AUSTRALIA: 4 males, same data as Holotype, (MEI 164559, 164562, 164574, 164571) (ANIC). AUSTRALIAN CAPITAL TERRITORY: female, Lees Spring, 1.iii.1949, S.P. [Sergei Paramonov?] (MEI 164537) (ANIC); female, Blundells Creek, Mar.1987, D. Colless, 35.22S, 148.50E, Malaise trap (MEI 164618) (ANIC). NEW SOUTH WALES: male, Monga, 8.ii.1959, Z. Liepa (MEI 165923) (ANIC); male, Tinderrys, 27.ii.1957, E.F. Riek (MEI 165927) (ANIC); male, Alpine Creek, 8 mls. E Kiandra, 21.iii.1962, Z.R. Liepa (MEI 165903) (ANIC).

Other material examined. AUSTRALIA: NEW SOUTH WALES: 5 males, 1 female, Tinderry Nature Reserve, intersection East Tinderry & Horse Flat fire trails, 13.5 km ENE Michelago, Malaise across drying creek, 16–29.i.2005, 1029 m, C.L. Lambkin, N. Starick, 35°40’45”S, 149°18’31”E (ANIC).

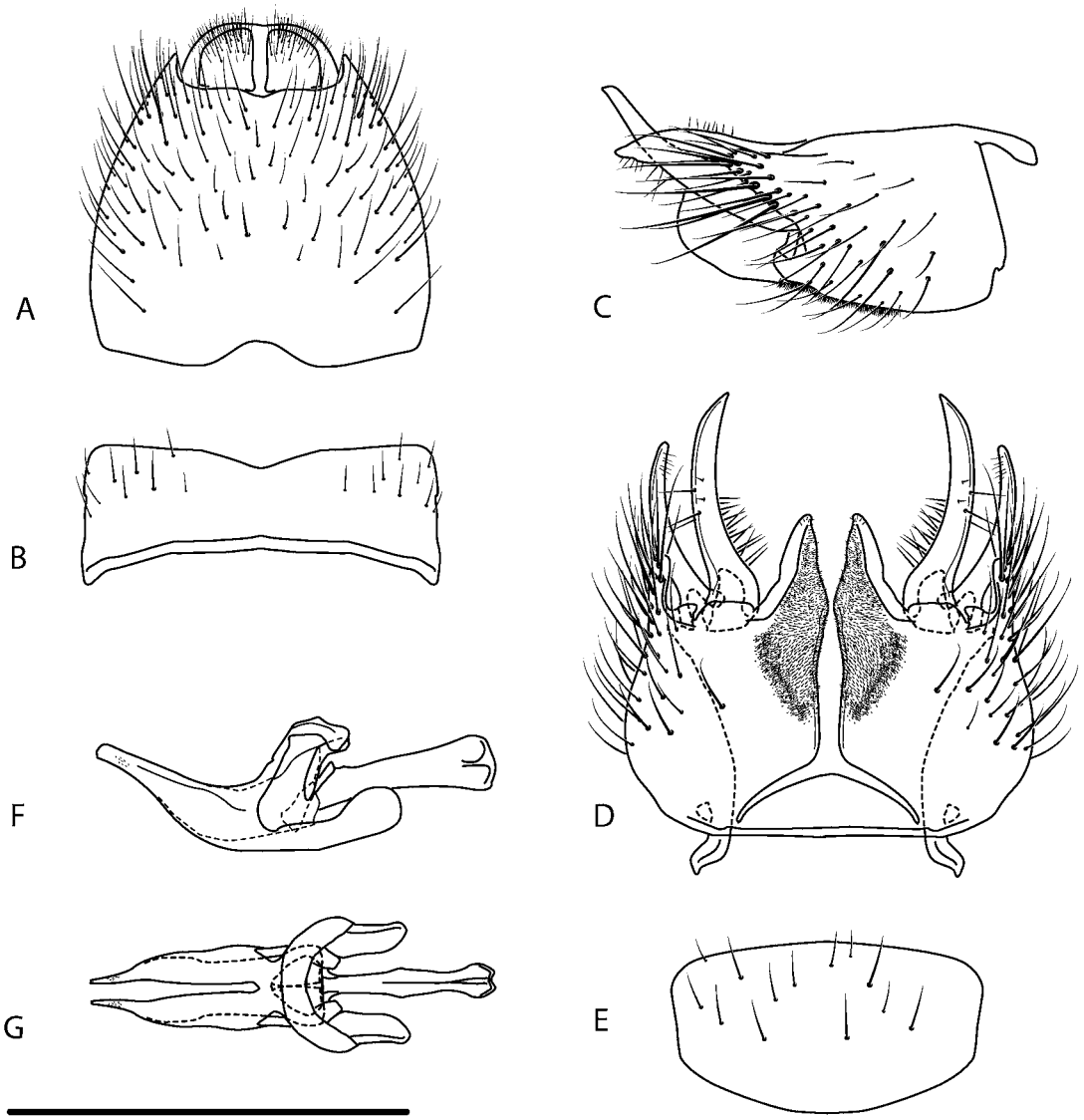

FIGURE 3. *Laxotela plata* **sp. nov.**, Male genitalia: A, epandrium, dorsal view; B, tergite 8, dorsal view; C, gonocoxites lateral view; D, same, ventral view; E, sternite 8, ventral view; F, aedeagus, lateral view; G, same, dorsal view. Scale line= 0.5 mm.

Diagnosis

Scutum patterned with brown, silver and matte black pubescence; enlarged setae on frons; male frons wider than ocellar tubercle at narrowest point; white macrosetae on hind and mid tibia; male abdomen with silver velutum; ventral apodeme of parameral process shorter than ejaculatory apodeme.

Description

Male. Body length: 6.0–6.5 mm.

Head. Brown to black, slightly longer than high; frons width equal to ocellar tubercle at narrowest point, antennal base positioned low on protruding lower frons, frons flat or only slightly concave midway and raised dorsally, frons rugose, overlain with dense grey-silver pubescence on lower two thirds, black on upper third, admixed with numerous elongate, dark setae; face covered with silver pubescence, smooth, glabrous laterally on lower face, narrow strip of silver pubescence extending from base of antennae to eye; ocellar tubercle flattened, overlain with bronze-black pubescence admixed with elongate setae; occiput slightly concave medially, black, overlain with dense grey pubescence, one-two rows of relatively long, black postocular setae dorsally; gena smooth, glossy black on lower portion, overlain with dense light grey pubescence dorsally, admixed with long, white setae; palp and labellum black with scattered pale setae; antennae shorter than head length, projecting anteroventrally, dark brown-black, overlain with light grey pubescence admixed with dark setae on scape pedicel and base of flagellum, flagellum turbinate.

Thorax. Brown or black, scutum overlain with patterned brown, grey and matte black pubescence, dark matte pubescence laterally and silver-white pubescence along lateral margin and postpronotal lobe, medial vitta of black pubescence, scutum uniformly admixed with fine, dark setae; scutal macrosetae black; scutellum overlain with grey pubescence, dark medially; pleuron and coxae glossy, black or brown, covered with dense grey pubescence except on anepisternum, anepimeron and katatergite; elongate pale setae dorsally on anepisternum, katepisternum, katatergite and coxae; legs black with white macrosetae on mid and hind tibiae; wing hyaline with distinct black mottling; venation brown; haltere brown, knob white; scutal chaetotaxy (pairs): np, 2–3; sa, 1; pa, 1; dc, 2–4; sc, 1.

Abdomen. Black, dense silver velutum extensively on segments 1–6, anteromedial portion of tergite 1 bronze-brown pubescent; intersegmental membranes on tergites 2–3 white; sparse elongate pale setae laterally on all segments; terminalia black.

Male genitalia. Terminalia dark, setae pale; epandrium short, width equal to length; cercus rounded (Fig. 3A); tergite 8 broad, only slightly emarginate medially (Fig. 3B); gonocoxal process much shorter than inner gonocoxal process (Figs 3C–D); gonocoxal apodeme very short; ventral lobe approximately 1/2 length of gonostylus; velutum patch at base on ventral lobe; hypandrium triangular, fused laterally to gonocoxites; sternite 8 broadly ovate to quadrangular (Fig. 3E); distiphallus short, narrow (Figs 3F–G); dorsal apodeme of parameral sheath well sclerotised, 'T'-shaped; ventral apodeme approximately 1/2 length of ejaculatory apodeme; lateral ejaculatory apodeme thick, projecting laterally.

Female. Body length 6.0 mm.

Similar to male except: frons only slightly wider than in male; abdomen without silver velutum.

Female genitalia. Tergite 8 with broad anterior process; furca complete, quadrangular with broad anterolateral flanges; spermathecae spherical, three spermathecal ducts joined to spermathecal duct close to bursa; spermathecal sac simple, elongate, without lobes or reticulations.

Etymology

The specific epithet is derived from the Spanish noun, *plata*, meaning silver; referring to the dense silver velutum on the male abdomen of this species.

Comments

Laxotela plata **sp. nov.** is very similar to *L. holstoni*; both are distinctively patterned with silver, brown and matte black pubescence on the scutum and have similar shaped male genitalia. This species is represented in the ANIC collection by a large series of specimens collected in Tinderry Nature Reserve (New South Wales) during February–March 2005.

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