

## New and Poorly Known Species of Crane Flies (Diptera: Limoniidae) from New South Wales, Australia

ZACARIAH D. BILLINGHAM<sup>1,2</sup>  AND GUNTHER THEISCHINGER<sup>3</sup> 

<sup>1</sup> Water Sciences, Natural Resources and Heritage,  
GHD, 180 Lonsdale Street, Melbourne VIC 3000, Australia

<sup>2</sup> PhD candidate, Department of Ecology, Environment and Evolution,  
La Trobe University, Bundoora VIC 3086, Australia

<sup>3</sup> Research Associate, Australian Museum Research Institute,  
Australian Museum, 6 College Street, Sydney NSW 2010, Australia

**Abstract.** Six new species of Australian crane fly are described: *Molophilus (Molophilus) avia* sp. nov., *M. (Molophilus) globostylus* sp. nov., *M. (Molophilus) sinuostylus* sp. nov., *M. (Molophilus) chichester* sp. nov., *M. (Molophilus) trispina* sp. nov., and *Dicranomyia (Dicranomyia) globosa* sp. nov. The poorly known species *M. (Molophilus) flavocingulatus* Alexander, 1928, *Teucholabis reginae* Alexander, 1931, *Hexatoma metallica* Schiner, 1868, *Skuseomyia eximia* Alexander, 1924, *Dicranomyia (Dicranomyia) monacha* Alexander, 1953, *Elephantomyia (Elephantomyodes) fumicosta* Alexander, 1922, *Orimarga joana* Alexander, 1926, and *Thrypticomomyia aureipennis* Skuse, 1890 are discussed and figured. In addition, the hitherto unknown females of *M. (Molophilus) bawbawiensis* and *M. (Molophilus) opulus* are described and figures of their ovipositors are provided.

### Introduction

Australia boasts a considerable diversity of limoniid crane flies, with 934 known species across 49 genera, belonging to the subfamilies Chioneinae, Limnophilinae and Limoniinae (Oosterbroek, 2021). Recent works have added many new species to the Australian fauna (Theischinger *et al.*, 2018a, 2018b, 2020; Billingham & Theischinger, 2018), and the present study adds a further six new species, elevating the total number of Australian Limoniidae to 940 species.

Despite this impressive diversity, many species of Australian limoniid are poorly known beyond the original

descriptions, and often sufficient detail is lacking to confidently distinguish closely related species. The present work seeks to improve this situation by adding descriptive notes for selected species of the poorly known genera *Elephantomyia* Osten Sacken, 1860, *Hexatoma* Latreille, 1809, *Orimarga* Osten Sacken, 1869, *Skuseomyia* Alexander, 1924, *Teucholabis* Osten Sacken, 1860 and *Thrypticomomyia* Skuse, 1890. Additionally, in the light of fresh material, descriptive notes are provided for the poorly known male, and two hitherto unknown females, of *Molophilus* Curtis, 1833 species.

**Keywords:** new species; Diptera; Limoniidae; Chioneinae; Limnophilinae; Limoniinae

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**ORCID:** ZB, 0000-0002-6163-9073; GT, 0000-0002-5207-2626

**Corresponding author:** Zacariah D. Billingham [zac.billingham@ghd.com](mailto:zac.billingham@ghd.com)

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## Materials and methods

Specimens were collected by sweeping a hand net through vegetation and then preserved in 100% ethanol. As a result of this preservation, the coloration of specimens might have changed from the natural state. The illustrations of the male genitalia (hypopygium) are from specimens cleared in KOH and displayed in glycerol.

Specimens have been deposited in the Entomology collection of the Australian Museum (AM), Sydney, in a vouchered research collection at the GHD water sciences laboratory, Melbourne, and in the collection of the first author (ZB).

Descriptive terminology is in accord with Cumming & Wood (2017).

The following abbreviations are used in figures: *ae*—aedeagus; *cerc*—cercus; *dc*—discal medial cell; *dl*—dorsal lobe of gonocoxite; *ge*—gonocoxite; *ib*—interbase; *ig*—inner gonostylus; *ll*—lateral lobe of gonocoxite; *ml*—medial lobe of gonocoxite; *og*—outer gonostylus; *pm*—parameres; *s9*—sternite 9; *t9*—tergite 9; *vl*—ventral lobe of gonocoxite; *vlv*—hypognathal valve.

## New and poorly known species of Chioneinae

### *Molophilus (Molophilus) gracilis* group

#### *Molophilus (Molophilus) avia* sp. nov.

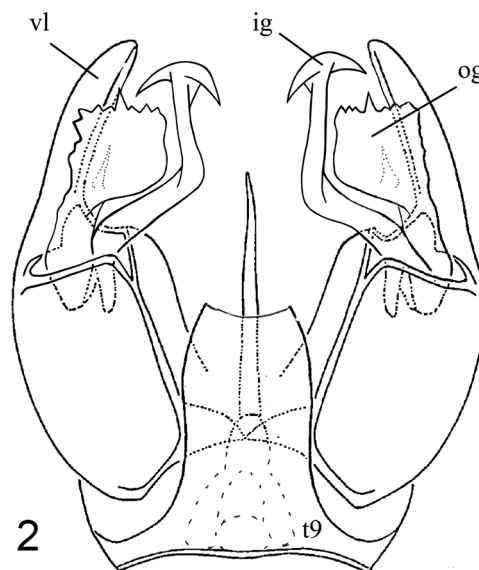
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Figs 1–2

**Holotype** ♂, Australia, New South Wales, Upper Karuah River, Burrawang Creek off Frying Pan Rd (32.232°S 151.764°E), 9 Nov 2018, Z. Billingham & G. Theischinger, AM (K.394953). **Paratypes** 1♂, Avon River, Tributary of Avon River off Berrico Rd (32.151°S 151.844°E), 10 Nov 2018, Z. Billingham & G. Theischinger, GHD (T22391); 1♂, Bulahdelah, Black Camp Creek off Knob Rd (32.377°S 152.153°E), 17 Nov 2018, Z. Billingham & G. Theischinger, AM (K.394954).



1



2

Figures 1–2. *Molophilus (Molophilus) avia* sp. nov., male. (1) head colouration, dorsal; (2) hypopygium, ventral view.

## Description ♂ (♀ unknown).

**Head** (Fig. 1): golden yellow, vertex with prominent dark greyish brown teardrop-shaped marking, antennal pedicel and scape pale whitish yellow, antennal flagellum with basal segments pale whitish yellow, terminal segments darkening to greyish brown, palpus dark greyish brown. Antenna of moderate length, extending back to the transverse suture.

**Thorax.** Pronotum with lateral edges golden yellow and dorsal angle dark greyish brown, otherwise whitish yellow. Prescutum and scutum golden brown, the posterior margins of scutal lobes pale yellowish brown. Scutellum mostly golden yellow with small darker golden brown basal area. Mediotergite largely golden yellow with darker golden brown central area. Paratergite bright white, in combination with pale portions of pronotum forming a distinct pale stripe between terga and pleura. Cervical sclerite, propleuron and pleurites golden yellow. Forecoxa golden yellow, meso- and metacoxa and trochanters pale whitish yellow. Basal 1/3 of femora pale golden yellow, remainder of femora darkening to greyish brown. Tibiae and tarsi dark greyish brown. Wing pale grey tinged with yellow, veins yellowish brown. Halter with stem and knob whitish yellow.

**Abdomen:** greyish brown.

**Terminalia** (Fig. 2). Hypopygium golden yellow, lobe of tergite 9 rather long, rectangular, caudal margin shallowly concave. Gonocoxite with large, tapering, apically rounded, ventral lobe bearing a fringe of strong setae on the medial edge, dorsal and medial lobes of gonocoxite undeveloped. Outer gonostylus short and club-shaped, caudal margin irregular serrate with a short prominent spine, ventral face with a serrate spine. Inner gonostylus long, heavily sclerotized and terminating in an axe-head-shaped blade, strongly bent at about half its length to project caudad. Aedeagus long and narrow. Parameres fused, poorly developed.

**Dimensions.** Body length (excluding antenna) 4.3 mm, wing length 4.5 mm.

**Etymology.** Latin for grandmother, this species is named in memory of Theresa “Tess” Billingham.

**Discussion.** *Molophilus (M.) avia* is allied to a large group of morphologically similar species around *M. (M.) capitatus* Alexander, 1927 and *M. (M.) auriculifer* Theischinger, 1988



**Figure 3.** *Molophilus (Molophilus) bawbawiensis*, female, ovipositor, lateral.

(see Theischinger, 1992 for more details on these species), and most closely resembles *M. (M.) gununo* Theischinger, 1992. *Molophilus (M.) avia* is readily distinguished from all similar species by the form of the inner gonostylus, with terminal axe-head shaped blade.

***Molophilus (Molophilus) bawbawiensis*  
Alexander, 1931**

Fig. 3

**Material examined. New South Wales:** 1♀, Kembla Heights, Tributary of Brandy and Water Creek off Harry Graham Drive (34.412°S 150.822°E), 29 Sep 2017, Z. Billingham & G. Theischinger, GHD (T17401); 2♀♀, Kembla Heights, American Creek off Cordeaux Rd (34.435°S 150.796°E), 29 Sep 2017, Z. Billingham & G. Theischinger, GHD (T17361–T17362); 1♀, Wildes Meadow, Yarrowa Creek off Belmore Falls Rd (34.629°S 150.561°E), 30 Sep 2017, Z. Billingham & G. Theischinger, AM (K.394955).

**Remarks.** Alexander (1931b) apparently had access to a female specimen of *M. (M.) bawbawiensis* however only provided a description of the male, with no accompanying figure of the hypopygium. In a review of Australian *Molophilus* by Theischinger (1992) a figure of the hypopygium was provided but, in the absence of additional material, the female remained undescribed. It is only now, with the collection of fresh material, that a description of the remarkable female of this species is possible.

**Female.** Size and coloration much the same as in male. Ovipositor (Fig 3) with tenth tergite greatly elongate, extending up to 1.5 mm, with a membranous area on the ventrolateral edge at about half the length of the tergite. Cercus straight and narrow, bluntly tipped and approximately 0.5 mm long. Sternite 9 not especially elongate, with a membranous area along the dorsal edge. Apex of hypogynial valve reaching just past the origin of the cercus.

**Discussion.** The highly modified ovipositor of *M. (M.) bawbawiensis* with greatly elongate tenth tergite seems unique among the species of Australian *Molophilus*, although it must be noted that females are not yet known or associated for many species.

***Molophilus (Molophilus) flavocingulatus*  
Alexander, 1928**

Figs 4–6

**Material examined. New South Wales:** 3♂♂, Gloucester Tops, Tributary of Gloucester River off Gloucester Falls Walking Track (32.098°S 151.597°E), 11 Nov 2018, Z. Billingham & G. Theischinger, AM (K.394956), GHD (T22969); 1♂, Gloucester Tops, Gloucester River off River Walking Track (32.090°S 151.586°E), 11 Nov 2018, Z. Billingham & G. Theischinger, GHD (T22108); 1♂, Barrington Tops, Little Murray Creek by Copperhead Crossing Track (31.982°S 151.458°E), 13 Nov 2018, Z. Billingham & G. Theischinger, GHD (T21692).

**Remarks.** *Molophilus (M.) flavocingulatus* was described by Alexander (1928) from a single, damaged, male specimen collected from the Barrington Tops region by the Sydney University Zoological expedition in the summer of 1925. While Alexander's description of *M. (M.) flavocingulatus* is adequate it was not accompanied by a figure of the hypopygium, making reliable identification of the species difficult. In the review of Australian *Molophilus* (Theischinger, 1992) no subsequent specimens of *M. (M.) flavocingulatus* were available, and, upon examination of the holotype, the hypopygium was found to be missing, leaving a figure of the hypopygium again wanting. The situation can now be rectified by the apparent rediscovery of *M. (M.) flavocingulatus*, with several male specimens having been recently collected by the authors from Gloucester and Barrington Tops.

**Male.** Photographs are included to show the general habitus (Fig. 4) and head colouration (Fig. 5) of male *M. (M.) flavocingulatus*. A figure of the hypopygium (Fig. 6) is also provided.

**Discussion.** *Molophilus (M.) flavocingulatus* is clearly allied to a group of eight morphologically similar species of *Molophilus* including; *M. (M.) christine* Theischinger, 1988, *M. (M.) extricatus* Alexander, 1930, *M. (M.) morulus* Alexander, 1929, *M. (M.) orumbera* Theischinger, 1994, *M. (M.) paradisisis* Billingham & Theischinger, 2018, *M. (M.) reductus* Alexander, 1927, *M. (M.) verticalis* Alexander, 1927, and *M. (M.) vulpinus* Alexander, 1929. All species of this group possess a well-developed lateral lobe and a

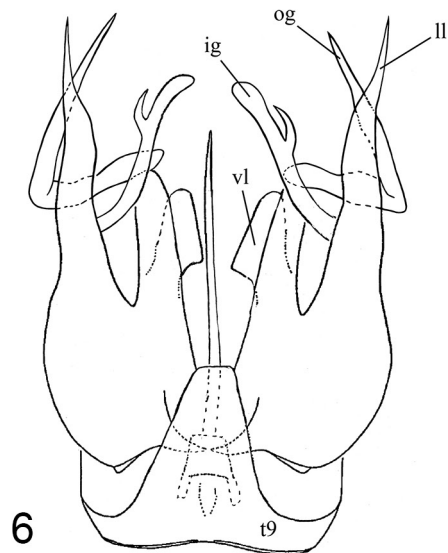




Figure 4. *Molophilus (Molophilus) flavocingulatus*, male, general habitus.

prominent, flat, short and apically rounded ventral lobe of the gonocoxite. Of these species *M. (M.) flavocingulatus* most closely resembles *M. (M.) paradisensis*, both possessing a lateral lobe that is long and finely pointed at the apex, and having an outer gonostylus with an undeveloped inner arm.

However, *M. (M.) flavocingulatus* is readily distinguished from *M. (M.) paradisensis* by the inner gonostylus, which bears a strong hook-like subapical spine in *M. (M.) flavocingulatus*, whereas in *M. (M.) paradisensis* only a small sub-apical denticle is present.



Figures 5–6. *Molophilus (Molophilus) flavocingulatus*, male. (5) head colouration, dorsal; (6) hypopygium, ventral view.



***Molophilus (Molophilus) globostylus* sp. nov.**

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Figs 7–8

**Holotype** ♂, Australia, New South Wales, Gloucester Tops, Tributary of Gloucester River off Gloucester Falls Walking Track (32.098°S 151.597°E), 11 Nov 2018, Z. Billingham & G. Theischinger, AM (K.394957). **Paratype** 1 ♂, Australia, New South Wales, Tomalla, Pheasant Creek off Pheasant Creek Rd (31.884°S 151.477°E), 12 Nov 2018, Z. Billingham & G. Theischinger, AM (K.394958).

**Description** ♂ (♀ unknown).

**Head** (Fig. 7): golden yellow, vertex with prominent dark greyish brown triangular marking, antennal pedicel and scape pale whitish yellow, antennal flagellum with basal segments pale whitish yellow, terminal segments darkening to greyish brown, palpus dark greyish brown. Antenna of moderate length, extending back to the transverse suture.

**Thorax.** Pronotum with dorsal angle pale yellow to white, otherwise golden yellow. Prescutum and scutum golden brown, the posterior margins of scutal lobes pale yellowish brown. Scutellum and mediotergite largely golden yellow, each with darker golden brown central area. Paratergite bright white, in combination with pale dorsal angle of pronotum forming a distinct pale stripe between terga and pleura. Cervical sclerite, propleuron and pleurites golden yellow. Forecoxa golden yellow, meso- and metacoxa and trochanters pale whitish yellow. Basal 1/3 of femora pale golden yellow, remainder darkening to greyish brown. Tibiae and tarsi dark greyish brown. Wing pale grey tinged with yellow, veins yellowish brown. Halter with stem and knob whitish yellow.

**Abdomen:** greyish brown.

**Terminalia** (Fig. 8). Hypopygium golden yellow, lobe of tergite 9 rather long, narrowly trapezoidal. Gonocoxite with moderately sized, apically bluntly rounded, ventral lobe, dorsal and medial lobes rather small. Outer gonostylus a short rod terminating in bifurcate subequal spines, bearing

on its dorsal surface a large swollen globe-shaped appendage. Inner gonostylus long, heavily sclerotized and terminating in an acute spine, strongly bent at about half its length to project caudad behind the globe-like appendage of the outer gonostylus. Aedeagus long and narrow. Parameres fused, poorly developed.

**Dimensions.** Body length 4.7 mm, wing length 4.9 mm.

**Etymology.** This species is named with reference to the prominent globe-shaped appendage of the outer gonostylus.

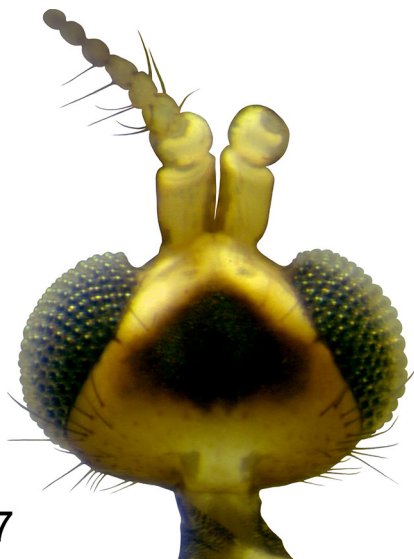
**Discussion.** *Molophilus (M.) globostylus* is allied to a large group of morphologically similar species around *M. (M.) capitatus* Alexander, 1927 and *M. (M.) auriculifer* Theischinger, 1988 (see Theischinger 1992 for more details on these species), and most closely resembles *M. (M.) sigma* Alexander, 1927. *Molophilus (M.) globostylus* is readily distinguished from all similar species by the bifurcate outer gonostylus with its large globe-shaped dorsal appendage.

***Molophilus (Molophilus) opulus* Alexander, 1929**

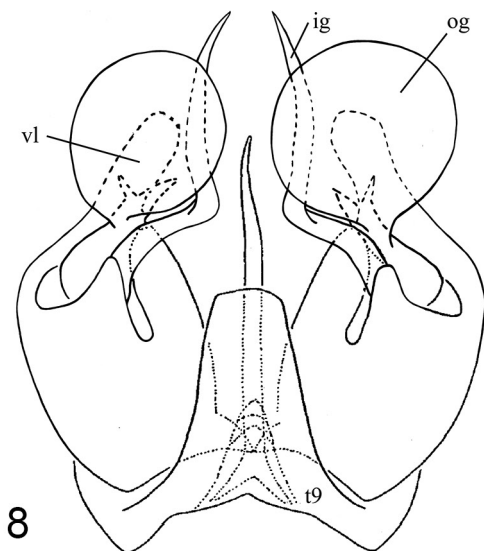
Fig. 9

**Material examined.** New South Wales: 1 ♀, Gordon, Blackbutt Creek off Blackbutt Creek Walking Track (33.759°S 151.142°E), 25 Sep 2017, Z. Billingham & G. Theischinger, GHD (T18458).

**Remarks.** This species was previously known only from male specimens, first described by Alexander (1929) then revised and figured by Theischinger (1992), the collection of fresh material now allows for description of the female. In many cases the female forms of *Molophilus* species remain unassociated, and even when pairs are found in copula the female often lacks significant characters for reliable morphological distinction between species. However, *M. (M.) opulus*, like *M. (M.) bawbawiensis* discussed above, has been found to show such unique modification of the ovipositor that it is readily distinguished from other female *Molophilus* and warrants description.

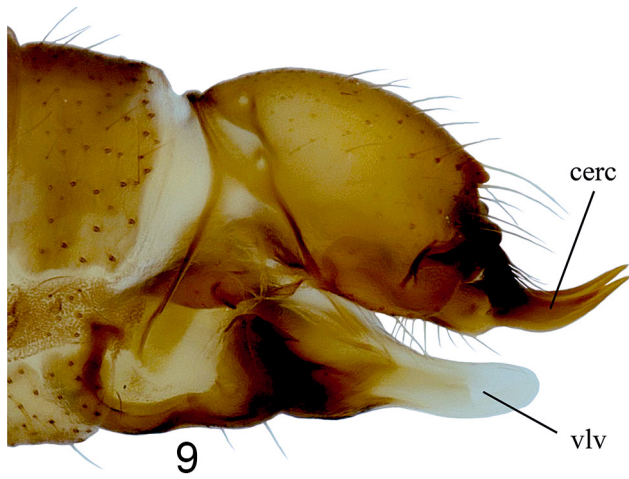


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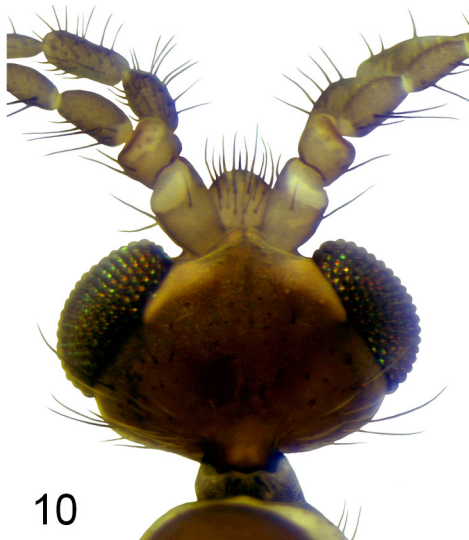
Figures 7–8. *Molophilus (Molophilus) globostylus* sp. nov., male. (7) head colouration, dorsal; (8) hypopygium, ventral view.



**Figure 9.** *Molophilus (Molophilus) opulus*, female, ovipositor, lateral.

**Female.** Size and coloration much the same as in male. Ovipositor (Fig 9) with tenth tergite short, stout, when viewed dorsally about as wide as long, with a short, rounded projection on dorsal surface before articulation with cerci. Cerci fused at base and forming a ventral concave area densely lined with short spinules. Beyond fused area cercus very short and strongly curving dorsad, tip sharply pointed. Sternite 9 short, with a membranous area along the dorsal edge. Hypogynial valve becoming membranous at about  $\frac{2}{3}$  its length, the tip rounded and fleshy, reaching about  $\frac{1}{2}$  the length of the cercus.

**Discussion.** The highly modified ovipositor seen in *M. (M.) opulus* with short, stout tenth tergite and short, strongly curved cercus with basal fused area is shared with the closely related species *M. (M.) vividus* Alexander, 1931. However, in *M. (M.) vividus* the apex of the hypogynial valve reaches the full length of the cercus, while in *M. (M.) opulus* it extends only about  $\frac{1}{2}$  the length. This modified form of ovipositor is likely also shared with two other presumed closely related species known only from northern Queensland, *M. (M.) mjobergi* Alexander, 1927 and *M. (M.) mediolobatus* Billingham & Theischinger, 2019, although females are not known for these two species.



***Molophilus (Molophilus) sinuostylus* sp. nov.**

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Figs 10–11

**Holotype** ♂, Australia, New South Wales, Barrington Tops, Little Murray Creek by Copperhead Crossing Track (31.982°S 151.458°E), 13 Nov 2018, Z. Billingham & G. Theischinger, AM (K.394959).

**Description** ♂ (♀ unknown).

**Head** (Fig. 10): dark greyish brown, with prominent pale yellow areas at the dorsal and ventral margins of the orbit, antenna and palpus paler brownish grey. Antenna of moderate length, extending back to mediotergite.

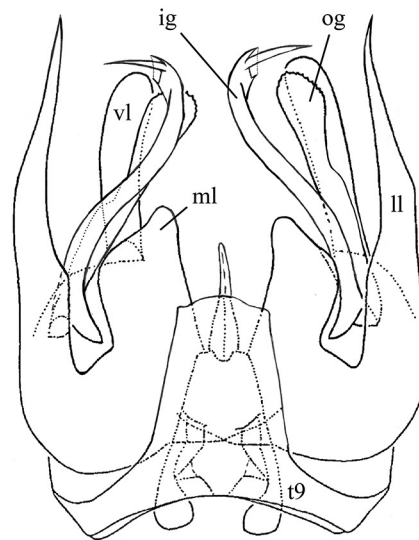
**Thorax.** Pronotum with dorsal angle pale yellow to white, otherwise dark greyish brown. Prescutum and mediotergite dark greyish brown. Scutum dark greyish brown with posterior margins of scutal lobes pale yellowish brown. Scutellum largely pale yellowish brown. Paratergite pale yellow to white, in combination with pale dorsal angle of pronotum forming a distinct pale stripe between terga and pleura. Cervical sclerite, propleuron and majority of pleurites dark brown, meron and metepisternum paler brown. Coxae, trochanters and basal  $\frac{1}{3}$  of femora pale brownish yellow, remainder of femora dark greyish brown. Tibiae and tarsi dark greyish brown. Wing pale grey with veins darker grey. Halter with stem and knob whitish.

**Abdomen:** greyish brown.

**Terminalia** (Fig. 11). Hypopygium brownish yellow, lobe of tergite 9 rather long, rectangular. Gonocoxite with long slender lateral lobe, ventral lobe of similar length, wider, and apically bluntly rounded, medial lobe short and rounded. Inner gonostylus long, sinuous, curving strongly laterally towards the apex, with a strong apical spine arising from within a membranous sheath. Outer gonostylus a straight rod, somewhat wider than inner gonostylus, narrowed at  $\frac{2}{3}$  length then widening again to form a broadly rounded, minutely serrate apex. Aedeagus short, moderately wide and conical. Parameres fused, quadrate.

**Dimensions.** Body length 5.3 mm, wing length 5.5 mm.

**Etymology.** This species is named with reference to the distinct sinuous form of the inner gonostylus.



**Figures 10–11.** *Molophilus (Molophilus) sinuostylus* sp. nov., male. (10) head colouration, dorsal; (11) hypopygium, ventral view.

**Discussion.** *Molophilus (M.) sinuostylus* is allied to a group of five morphologically similar species including *M. (M.) difficilis* Alexander, 1927, *M. (M.) exsertus* Alexander, 1927, *M. (M.) spiculistylatus* Alexander, 1930, *M. (M.) insertus* Theischinger, 1992 and *M. (M.) breeae* Billingham & Theischinger, 2018. Of these species *M. (M.) sinuostylus* most closely resembles *M. (M.) difficilis*, both possessing a sinuous inner gonostylus and short and rounded medial lobe of the gonocoxite, while the remaining species have a straight inner gonostylus and a sharply pointed or hooked medial lobe. *Molophilus (M.) sinuostylus* is readily distinguished from *M. (M.) difficilis* by the length of the apical spine of the inner gonostylus, which is nearly  $\frac{1}{3}$  the length of the gonostylus in *M. (M.) difficilis*, while in *M. (M.) sinuostylus* the apical spine is barely  $\frac{1}{5}$  the length of the gonostylus, and by the apex of the outer gonostylus, which is smooth in *M. (M.) difficilis* and minutely serrate in *M. (M.) sinuostylus*.

### *Molophilus (Molophilus) plagiatus* group

#### *Molophilus (Molophilus) chichester* sp. nov.

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Fig 12

**Holotype** ♂, Australia, New South Wales, Upper Karuah River, Tributary of Turkey Scratch Creek off Cabbage Tree Rd (32.242°S 151.790°E), 8 Nov 2018, Z. Billingham & G. Theischinger, AM (K.394960).

**Description** ♂ (♀ unknown).

**Head:** pale whitish yellow, antennal pedicel and scape pale whitish yellow, antennal flagellum with basal segments pale whitish yellow, terminal segments darkening to greyish brown, palpus dark greyish brown. Antenna extending back to prescutal pit.

**Thorax.** Pronotum whitish. Prescutum, scutum, scutellum and mediotergite pale whitish yellow. Cervical sclerite and pleurites pale whitish yellow. Coxae, trochanters, femora

and tibiae pale whitish yellow, tarsi greyish brown to black. Wing hyaline with veins pale yellowish brown. Halter with stem pale whitish yellow, knob white.

**Abdomen:** pale whitish yellow.

**Terminalia** (Fig. 12). Hypopygium pale whitish yellow with lobe of tergite 9 wide, rather quadrate, caudal margin straight. Gonocoxite with dorsolateral lobe very small, medial lobe not prominent and ventral lobe large, largely parallel sided and apically strongly bowed mediad, ending in a strongly hooked beak. Inner gonostylus long, faintly curving laterally, when viewed ventrally the tip appearing to curve mediad, with the mesal face finely serrate, when viewed laterally the tip ventrally flanged, giving it a spatulate appearance. Outer gonostylus largely parallel sided, with apex forked into two prongs, the outer prong larger than the inner. Aedeagus thin and of moderate length, parameres fused, oval to truncate.

**Dimensions.** Body length 3.8 mm, wing length 4.1 mm.

**Etymology.** This species is named for the Chichester forest region of New South Wales whence it was collected.

**Discussion.** *Molophilus (M.) chichester* is allied to numerous morphologically similar species around *M. (M.) flavidellus* Alexander, 1930 (see Theischinger 1992 for more details on these species). It can be distinguished from all of these species by the curved spatulate inner gonostylus.

#### *Molophilus (Molophilus) trispina* sp. nov.

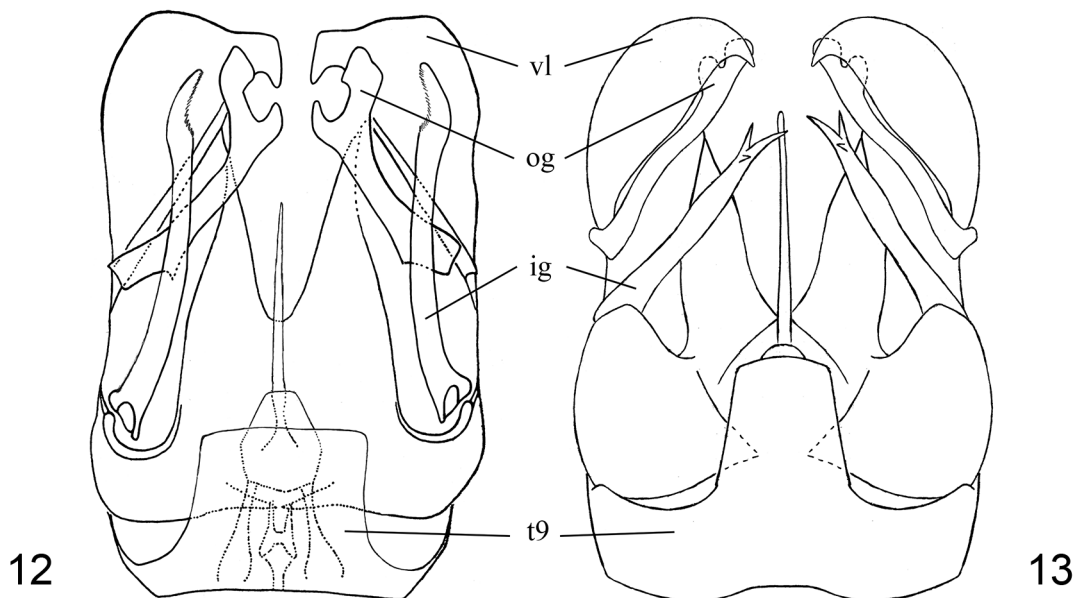
urn:lsid:zoobank.org:act:C5390483-A77B-426C-84A4-9005E706FEDE

Fig 13

**Holotype** ♂, Australia, New South Wales, Kembla Heights, American Creek off Cordeaux Rd (34.435°S 150.796°E), 29 Sep 2017, Z. Billingham & G. Theischinger, AM (K.394961).

**Description** ♂ (♀ unknown).

**Head:** pale whitish yellow, antennal pedicel and scape pale whitish yellow, antennal flagellum with basal segments pale whitish yellow, terminal segments missing, palpus pale whitish.



Figures 12–13. hypopygium, ventral view. (12) *Molophilus (Molophilus) chichester* sp. nov.; (13) *Molophilus (Molophilus) trispina* sp. nov.



*Thorax.* Pronotum whitish. Prescutum, scutum, scutellum and mediotergite pale whitish yellow. Cervical sclerite and pleurites pale whitish yellow. Coxae and trochanters pale whitish yellow, other leg segments missing. Wing hyaline with veins pale whitish yellow. Halter with stem pale whitish yellow, knob white.

*Abdomen:* pale whitish yellow.

*Terminalia* (Fig. 13). Hypopygium pale whitish yellow with lobe of tergite 9 quadrate, caudal margin straight. Gonocoxite with ventral lobe large, edges broadly rounded and apically strongly bowed mediad, ending in a dark strongly hooked beak. Inner gonostylus about  $\frac{2}{3}$  the length of the ventral lobe, mostly straight, with three spines towards the tip; one terminal, long and faintly curving medially, one long, faintly hooked on the dorsal edge, one short, appressed on the face of the style. Outer gonostylus largely parallel sided, with apex forked into two mostly even prongs. Aedeagus long and thin.

*Dimensions.* Body length 4 mm, wing length 4.5 mm.

**Etymology.** This species is named with reference to the three-spined tip of the inner gonostylus.

**Discussion.** *Molophilus* (*M.*) *trispina* is allied to numerous morphologically similar species around *M. (M.) flavidellus* Alexander, 1930 (see Theischinger 1992 for more details on these species). It can be distinguished from all of these species by the tip of the inner gonostylus, which bears three distinct spines.

## *Teucholabis (Teucholabis) reginae*

Alexander, 1931

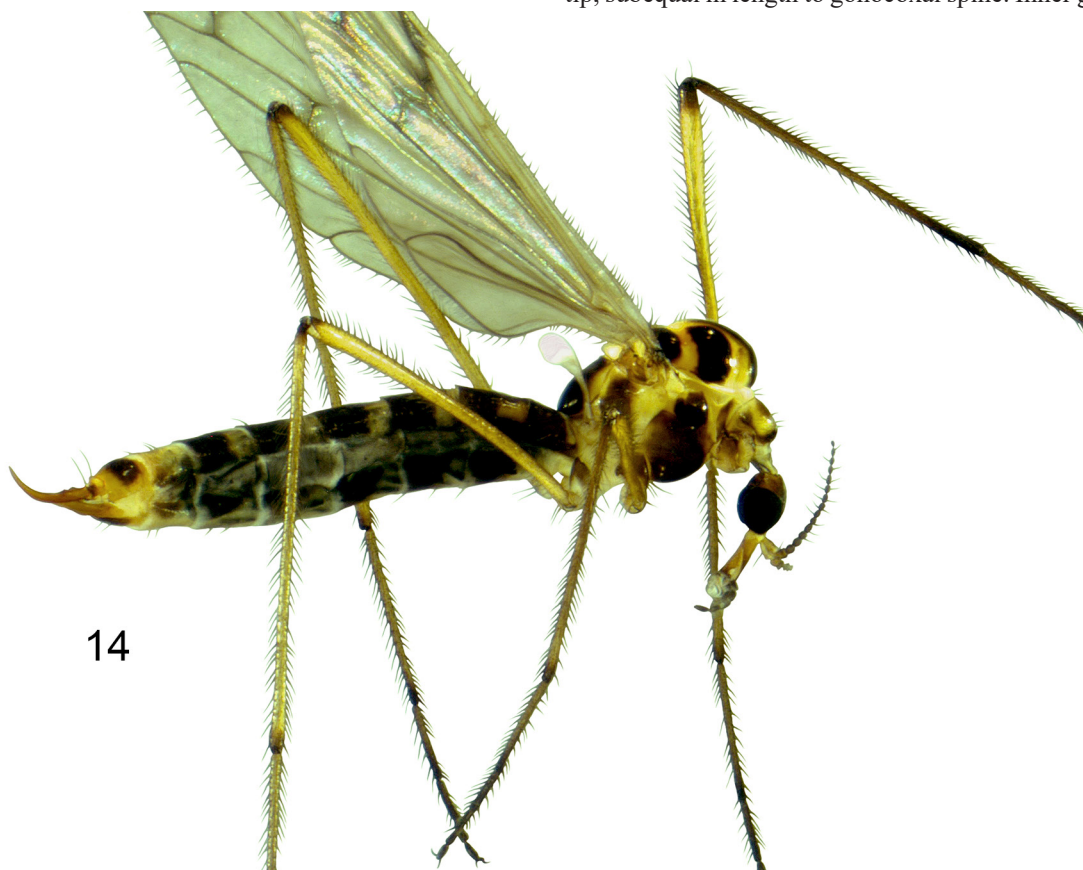
Figs 14–19

**Material examined.** New South Wales: 1♂, Upper Allyn, Allyn River by “The Allyn Riverside Cabins” (32.187°S 151.502°E), 6 Nov 2018, Z. Billingham & G. Theischinger, AM (K.394962); 2♂♂, 1♀, Upper Allyn, Tributary of Allyn River off Allyn River Forest Rd (32.125°S 151.469°E), 7 Nov 2018, Z. Billingham & G. Theischinger, GHD (T23684–T23686); 1♀, Upper Karuah River, Tributary of Turkey Scratch Creek off Cabbage Tree Rd (32.242°S 151.790°E), 8 Nov 2018, Z. Billingham & G. Theischinger, GHD (T22567).

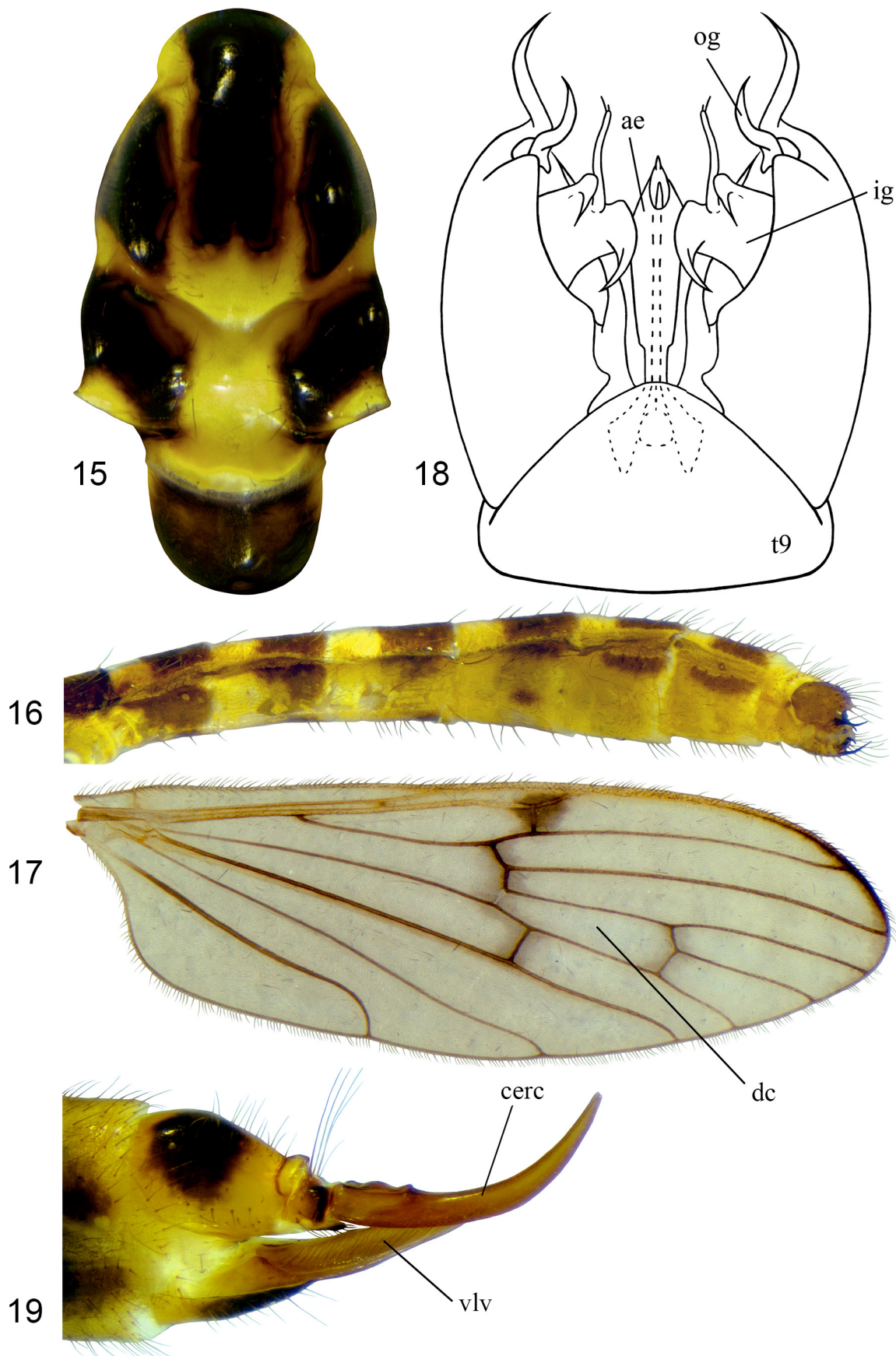
**Remarks.** While Alexander’s description of *T. (T.) reginae* is adequate it did not include a detailed description or figure of the hypopygium, making comparison to other species in the genus difficult. The availability of fresh material of *T. (T.) reginae* now allows for a thorough description of the hypopygium, a description of the ovipositor and provision of figures to aid in identification.

Photographs are included to show the general habitus (Fig. 14), dorsal thoracic colouration (Fig. 15), abdominal colouration (Fig. 16), wing (Fig. 17), and ovipositor (Fig. 19). A figure of the hypopygium (Fig. 18) is also provided.

**Male.** Hypopygium with tergite and sternite 9 bright yellow, gonocoxites greyish brown. Distal margin of T9 broadly rounded. Gonocoxite with long setae arising from numerous blackened tubercles along the lateral margin, distally produced into a sinuous, sharply pointed spine. Outer gonostylus a slender sinuous rod, sharply pointed at tip, subequal in length to gonocoxal spine. Inner gonostylus



**Figure 14.** *Teucholabis (Teucholabis) reginae*, female, general habitus.



**Figures 15–19.** *Teucholabis (Teucholabis) reginae*. (15) thoracic colouration, dorsal; (16) abdominal colouration, lateral; (17) wing; (18) hypopygium, dorsal view; (19) ovipositor, lateral.



broad, quadrate, distal margin trilobate, upper and lower lobes produced into strongly sclerotized, sharply pointed hooks, middle lobe elongate, fleshy, bluntly tipped and bearing several prominent setae. Aedeagus a little shorter than gonocoxite, broad, largely sclerotized, only base and tip membranous, tip bearing several setae and short triangular lobe with blackened apex. The sternal pockets described for many male *Teucholabis* as being present on the fifth and sixth sternites are completely lacking in *T. (T.) reginae*.

**Female.** Size and colouration much the same as in male. Ovipositor with tenth tergite largely bright yellow with large dark brown to black central marking. Sternite mostly dark brown to black, bright yellow only at base. Cercus long and strongly arched dorsad. Tip of hypogynial valve reaching to about  $\frac{1}{3}$  the length of cercus.

**Discussion.** Only two species of *Teucholabis* are known from Australia, *T. (T.) reginae* from southern Queensland and northern New South Wales, and *T. (T.) meridiana* Skuse, 1890, from Victoria. Both species are, according to Alexander (1931a), “very similar”, with apparently only minor differences in body colouration and wing venation separating the two. Alexander points to the length of the discal medial cell as a notable distinction between these species, suggesting that the discal medial cell of *T. (T.) meridiana* is somewhat shorter than that of *T. (T.) reginae*. However, examination of the type material for both species and the fresh material of *T. (T.) reginae* show all to have near identical wing venation, leaving this as an unsuitable character for separating the two species. Regrettably the type of *T. (T.) meridiana* was found to be missing the abdomen, leaving the hypopygium apparently lost, and, as Skuse (1890) does not provide a description of the hypopygium, the two species cannot be distinguished by features of the genitalia. Despite extensive searching by the first author across Victoria no fresh material of *T. (T.) meridiana* has been found, and, until such material becomes available, *T. (T.) meridiana* is considered as a *nomen dubium*.

## Poorly known species of Limnophilinae

### *Hexatoma (Eriocera) metallica* Schiner, 1868

Figs 20–23

**Material examined. Australian Capital Territory:** 2♀♀, Tidbinbilla, 1 Dec 1935, Mackerras & Fuller (ZB). **New South Wales:** 1♀, Wilson River Reserve, 26 Nov 1966, D. McAlpine (ZB); 1♂, Kembla Heights, American Creek off Cordeaux Rd (34.437°S 150.795°E), 19 Nov 2018, Z. Billingham & G. Theischinger, GHD (T21736). **Victoria:** 1♂, Victoria, Bindi, Tambo River at Blackfellows Flat (37.058°S 147.827°E), 29 Nov 2011, Z. Billingham, GHD (T1522).

**Remarks.** Skuse (1890) provides the first description of *H. (E.) metallica* in English, with the original description (Schiner, 1868) having been given in German. While the description provided by Skuse is more detailed, the hypopygium was not described in detail. With the availability of fresh material a thorough description of the hypopygium is now possible, along with a description of the ovipositor.

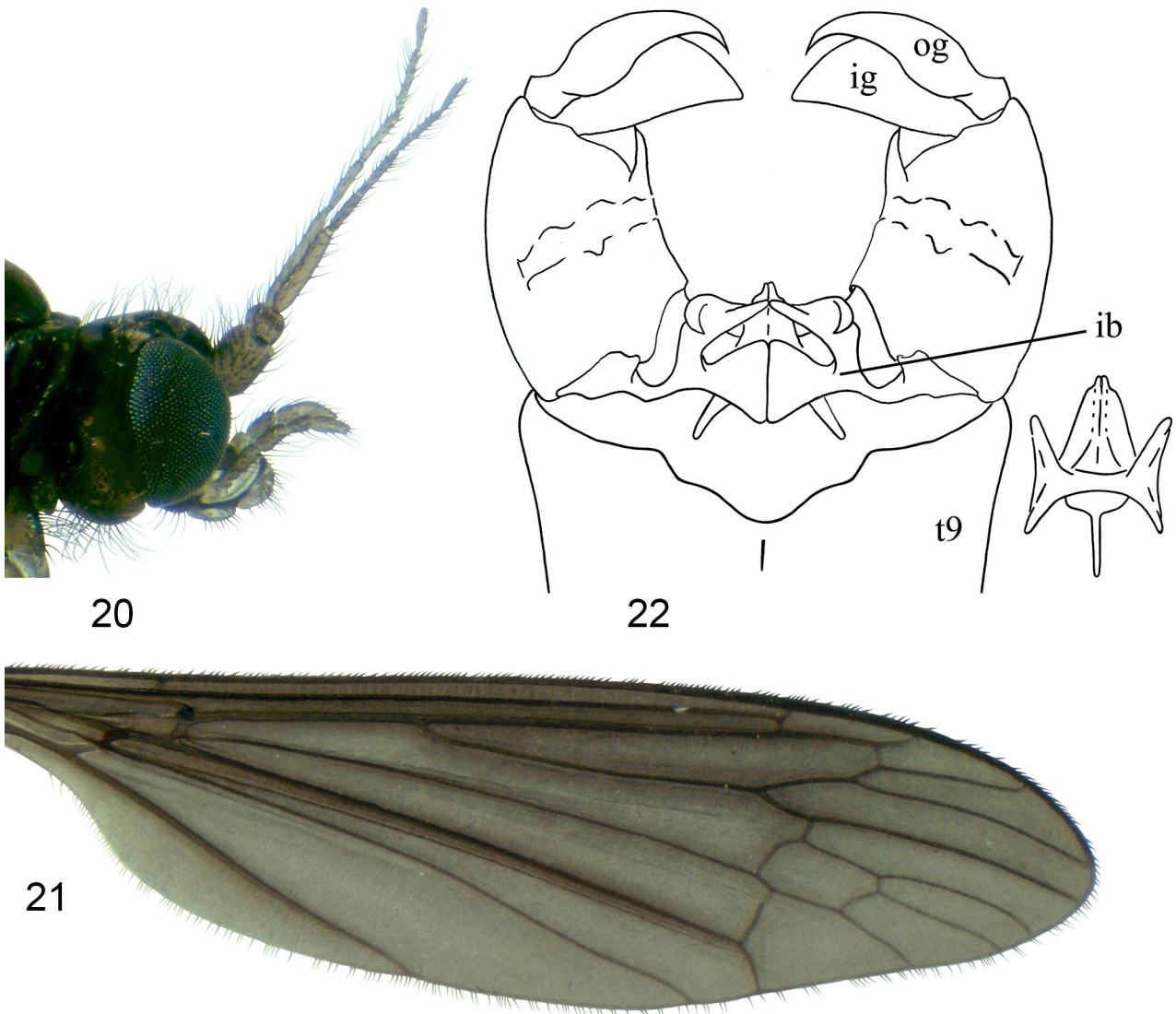
A general description of the male is also provided, with particular emphasis on updating the wing venation, the terminology in Skuse (1890) being now somewhat outdated.

**Male.** body length 11.2 mm, wing length 10.1 mm. Head (Fig. 20) dark greyish brown, vertex with swollen, low, rounded tubercle. Antenna and palpus yellowish brown. Antenna with seven segments, flagellomeres elongate, cylindrical, first segment especially so. Antenna extending back a little past the prescutal pit. Dorsal thoracic segments all dark greyish brown to black, with prominent metallic blueish to greenish sheen. Pleurites greyish brown, metallic sheen less prominent. Coxae, trochanters, femora and tibiae greyish brown, tarsi darkening to black. Wing with deep grey tinge, stigma not evident, veins greyish brown (Fig. 21). Sc long, extending a short distance beyond the fork of Rs, sc-r just before its tip, Rs in close alignment with R<sub>5</sub>, the two of similar length, R<sub>2+3</sub> and R<sub>2</sub> each about half the length of the fairly long R<sub>2+3+4</sub>; r-m and m-cu in near alignment, both situated a short distance past the base of the discal medial cell, discal medial cell closed, cell m1 lacking. Halter with stem greyish brown, knob pale greyish. Abdomen generally dark greyish brown to black, tergites with prominent metallic blueish to greenish sheen. Hypopygium (Fig. 22) with T9 dark greyish brown with metallic sheen, gonocoxites dark brown with pale, nearly membranous horizontal band at about midlength. Distal margin of tergite with shallow irregular V-shaped concavity, sternite with broad, and considerably deeper V-shaped concavity. Gonocoxites fairly short, subequal to length of T9. Outer gonostylus gently curved, broad at the base and narrowing gradually to a sharply pointed tip. Inner gonostylus broad and fleshy, leaf shaped, a little longer than the outer gonostylus. Interbase greatly developed, branching into two arms, the lower arm broad and trapezoidal in shape, together with the lower arm of the opposing interbase forming a quadrate shield above the aedeagal complex, upper arm with a prominent short, hooked process near its base, then gradually tapering to a blunt tip. Aedeagal complex somewhat low saddle-shaped at base, aedeagus not extending far past the upper arms of the interbase.

**Female.** Size and colouration much the same as for male. Ovipositor (Fig. 36) with tergite and sternite dark greyish brown, cercus and valve lighter brown. Cercus long, mostly straight, tip rounded. Tip of hypogynial valve reaching to about  $\frac{1}{2}$  length of cercus, valve with row of long, thick, setae along dorsal margin.

**Discussion.** Four species of *Hexatoma* are known from Australia: *H. (E.) aperta* Alexander, 1920 and *H. (E.) australiensis* Alexander, 1920, both known only from the Cairns area of Queensland, *H. (E.) metallica*, known from multiple locations from the south of Sydney to the east of Victoria and into the Victorian Alps, and *H. (E.) setifera*, known only from Uriarra near Canberra. *Hexatoma (E.) metallica* is the only Australian species whose male is known, with all other species having been described from female specimens; as a result no comparisons can be made between the hypopygia of the Australian species. However, *H. (E.) metallica* is readily distinguished from all other Australian species of *Hexatoma* by the body colouration, with no other species showing the prominent metallic sheen on the dorsal surface of thorax and abdomen.





Figures 20–22. *Hexatoma metallica* male. (20) head, lateral; (21) wing; (22) hypopygium, dorsal view, with aedeagal complex inset.



Figures 23. *Hexatoma metallica* female (23) ovipositor, lateral, with hypogynial valve inset.

*Skuseomyia eximia* Alexander, 1924

Figs 24–28

**Material examined.** **New South Wales:** 2♀♀, Dorrigo National Park, 11 Nov 1967, N. Dobrotworsky (ZB); 1♂, Chichester, Whitehouse Creek off Wangat Rd (32.120°S 151.681°E), 8 Nov 2018, Z. Billingham & G. Theischinger, GHD (T24276). **Queensland:** 1♀, Binna Burra, 9 Dec 1966, N. Dobrotworsky (ZB); 1♀, Cunninghams Gap, 5 Apr 1967, N. Dobrotworsky (ZB); 1♀, Maleny, 6 Apr 1967, N. Dobrotworsky (ZB).

**Remarks.** Alexander (1924) had only two female specimens of *Skuseomyia eximia* available when describing the species, leaving the male undescribed. A full account of the male is now possible with the availability of fresh material.

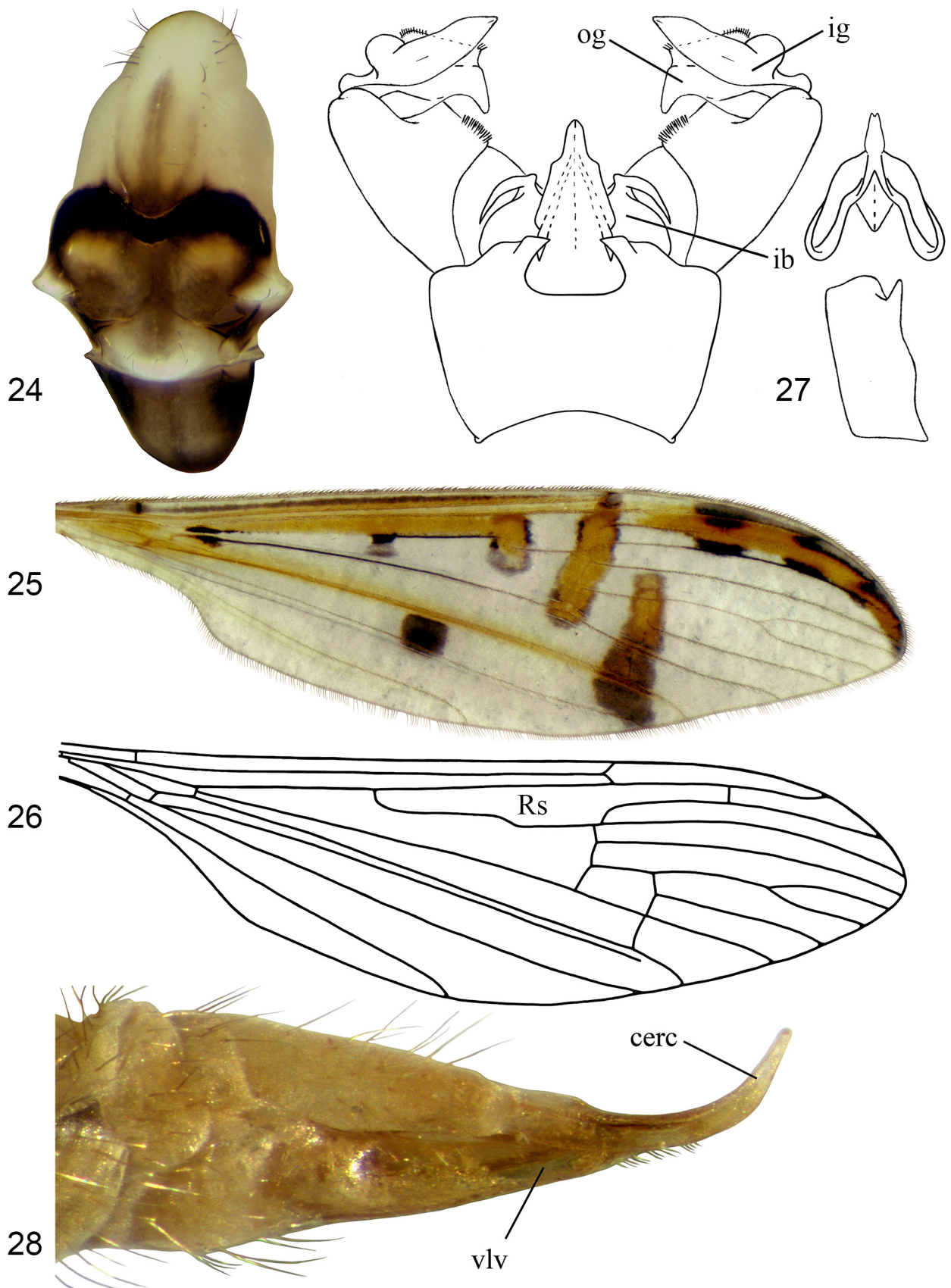
Photographs are included to show the dorsal thoracic colouration (Fig. 24), wing patterning (Fig. 25) and the ovipositor (Fig. 28). Figures of the wing venation (Fig. 26) and dorsal view of the hypopygium (Fig. 27) is also provided.

**Male.** Similar in size to female. Head pale yellowish white, faintly darker grey at the vertex. Antenna with scape yellowish white, pedicel greyish yellow, flagellomeres greyish yellow, darkening to brownish towards the tips, palpus greyish yellow. Pronotum and prescutum yellowish white; scutum largely yellowish white with median greyish brown line extending to the transverse suture, prominent deep black cross band along the transverse suture, scutal lobes largely brownish yellow, lateral angles pale yellowish white; scutellum pale yellowish brown anteriorly, yellowish white posteriorly; mediotergite greyish brown medially, lateral edges darker grey (Fig. 24). Pleurites largely yellowish white, the anterior angle of katepisternum and dorsal edge of laterotergite greyish brown. Coxae yellowish white, anterior angles faintly darker greyish brown; trochanters yellowish white; femora yellowish, darkening faintly to brown towards the tips; tibiae yellowish, tarsi darkening to brown. Wing hyaline with extensive patterning; a greyish to orange transverse streak through c and along Sc; an elongate brownish orange transverse streak arising in the distal section of r1 running along the wing margin, encompassing all of r2, nearly half of r3, the tips of r4 and r5 and terminating in m1, anterior and posterior borders intermittently seamed with dark grey to black; an elongate brownish orange transverse streak arising at the base of br and running along R, encompassing the origin of Rs and extending to the “step-like” curve of Rs, there expanding into an ovoid patch, borders intermittently seamed with dark grey to black; an elongate brownish orange longitudinal streak arising at the tip of Sc and extending along the bases of R<sub>2+3</sub>, R<sub>4</sub> and R<sub>5</sub>, along r-m and the base of the discal medial cell to terminate on M, borders intermittently seamed with dark grey; small dark grey to black marking at the base of bm extending as a

dark seam along much of M; an elongate brownish orange longitudinal streak that darkens posteriorly to greyish brown arising in the basal 1/3 of r5 and extending along the distal end of the discal medial cell and m-cu to terminate at the tip of CuP; a narrow orange streak along much of CuA; a dark greyish brown circular marking at about half the length of cup (Fig. 25). Sc long, extending beyond the fork of Rs, sc-r at its tip, Rs straight with a “step-like” curve near mid length, R<sub>2+3+4</sub> a little shorter than the base of R<sub>5</sub>, R<sub>2+3</sub> a little shorter than R<sub>3</sub>, R<sub>4</sub> and R<sub>5</sub> of similar length, base of R<sub>5</sub>, r-m and base of discal medial cell in near alignment, discal medial cell closed, cell m<sub>1</sub> present, a little longer than its petiole, m-cu situated a short distance before the distal end of the discal medial cell, CuP elongate, its tip somewhat close to the tip of CuA, A<sub>1</sub> quite straight, curving faintly at the tip (Fig. 26). Halter elongate, extending back to the posterior margin of the second abdominal segment, stem pale greyish, knob a little darker. Abdomen with first tergite yellowish brown, lateral edges darker greyish, second tergite largely yellowish with a pair of small greyish brown markings in posterior half, tergites 3–7 yellowish with subterminal dark greyish brown marking, in some individuals forming a near complete crossband, in others broken medially, eighth tergite dark brown to black, posterior margin broadly concave. Hypopygium (Fig. 27) with ninth tergite and sternite dark brown to black, gonocoxites light greyish brown. Distal margin of T9 drawn out into a pair of curved spinous processes, giving the area between them the appearance of an ovoid excision. Gonocoxite a little longer than T9, quite broad, at base on medial surface with a dense brush like patch of short setae, on ventromedial edge towards tip with short triangular process. Outer gonostylus blade like, tip blunt, acute, a prominent circular lobe towards the base of the style. Inner gonostylus strongly hooked towards tip, medial surface with deep groove accommodating the outer gonostylus, distal edge with a low flange bearing numerous short bristle-like setae. Interbase with base broad, circular and plate like, on distal edge with a low, strongly hooked branch, extended to a sharp pointed tip. Aedeagal complex not extending much beyond the brush-like patch of setae on the gonocoxites, with broad, quadrate, somewhat membranous lateral plates at base, seemingly formed by the parameres, narrowing considerably in the distal 1/3 to a conical, faintly bilobed tip.

**Female.** Ovipositor (Fig. 28) yellowish brown. Cercus of moderate length, strongly arched dorsad. Tip of hypogynial valve reaching to about 1/2 length of cercus.

**Discussion.** The monotypic *Skuseomyia* is remarkably distinct among the Australian limoniid fauna and readily recognized by the deep black cross band along the transverse suture, characteristic wing patterning and peculiar wing venation, with Rs curved “step-like” at about mid length.



Figures 24–28. *Skuseomyia eximia* (24) thoracic colouration, dorsal; (25) wing pattern; (26) wing venation; (27) hypopygium, dorsal view, with aedeagal complex and ventral gonocoxite inset; (28) ovipositor, lateral.



## New and poorly known species of Limoniinae

### *Dicranomyia (Dicranomyia) globosa* sp. nov.

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Figs 29–32

**Holotype** ♂, Australia, New South Wales, Ku-Ring-Gai Chase, McCarrs Creek by Upper Gledhill Falls off McCarrs Creek Rd (33.663°S 151.250°E), 25 Sep 2017, Z. Billingham & G. Theischinger, AM (K.394963).

**Description** ♂ (♀ unknown).

**Head.** Antenna and palpus greyish brown. Antenna of moderate length, extending back to the prescutal pit, pedicel and flagellomeres 1–11 distinctly rounded, spherical, ultimate segment more conical.

**Thorax** (Fig 29). Thoracic segments dorsally all dark brown, posterior areas of scutal lobes and scutellum a little lighter. Pleurites mostly uniform brown, propleuron and anepisternum a little darker. Coxae brownish, trochanters yellowish brown. Femora, tibiae, and first tarsal segment yellowish brown, darkening to greyish black at the tips, remaining tarsal segments greyish black.

**Wing** (Fig. 30): brownish grey, extensively variegated with hyaline patches, veins brownish. Sc extending to nearly ½ length of Rs, sc-r some distance before its tip in alignment with the fork of Rs, m-cu situated a little more than half its length before the base of the discal medial cell. Halter with stem deep greyish, knob lighter grey.

**Abdomen:** greyish brown.

**Terminalia** (Figs 31, 32). Hypopygium largely yellowish brown, lobes of inner gonostylus lighter yellowish white. T9 apically shallowly bilobed. Ventral lobe of gonocoxite rounded, about ½ the length of gonocoxite. Inner gonostylus approximately equal in length to gonocoxite, lobe rounded, globe-shaped, rostral prolongation of moderate length, lightly arched, tapering to a blunt tip, bearing two long spines at about ⅔ length of the prolongation. Outer gonostylus a strongly arched rod, narrowing gradually to a sharp tip. Aedeagus a little shorter than gonocoxite, the tip faintly bilobed, parameres about ¾ the length of the aedeagus, lateral lobe low and rounded, mesal lobe gradually tapering to a sharp curved tip.

**Dimensions.** Body length 6.8 mm, wing length 7.3 mm.

**Etymology.** This species is named with reference to the globose lobe of the inner gonostylus.

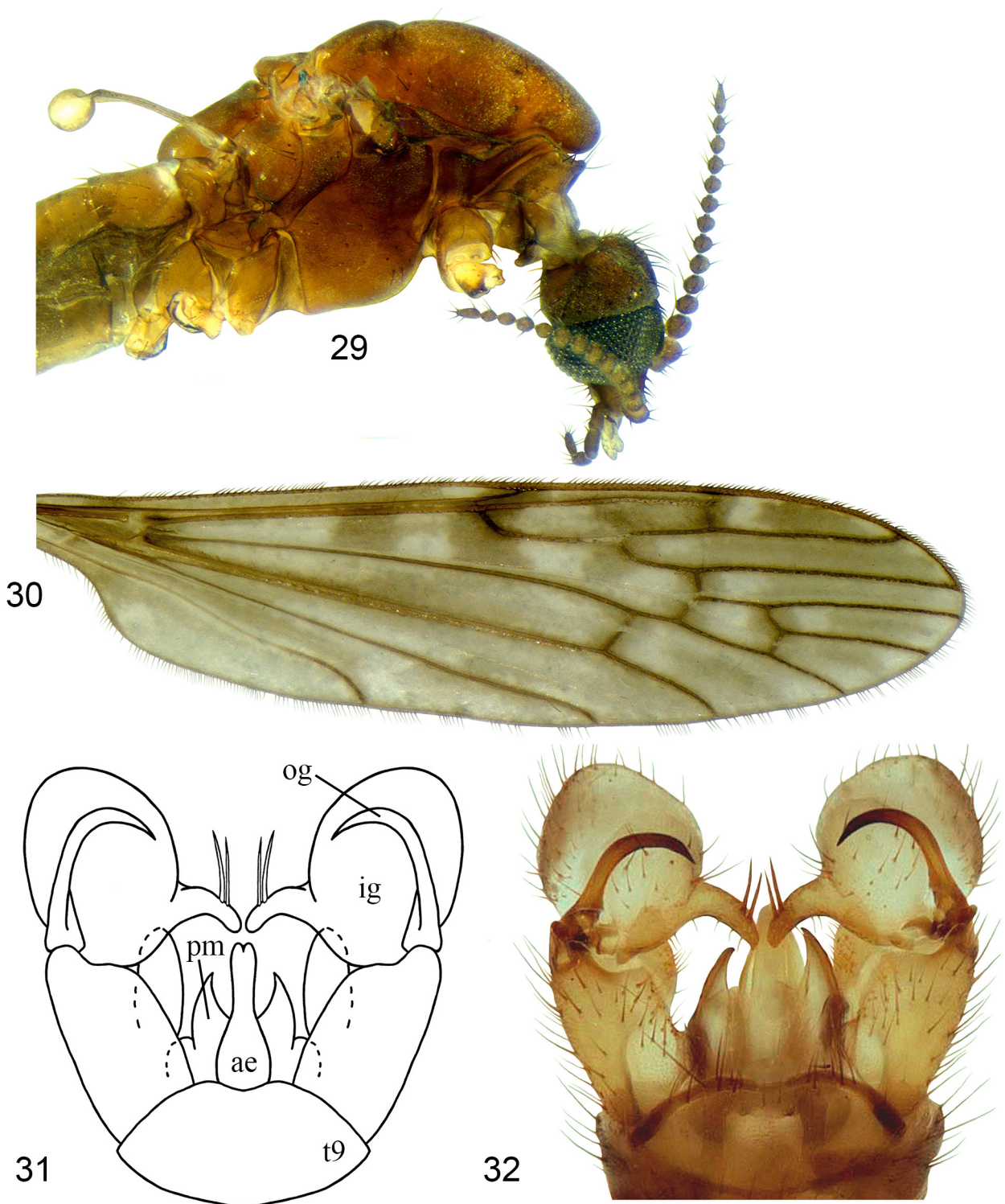
**Discussion.** *Dicranomyia (D.) globosa* is closely allied to numerous morphologically similar species around *D. (D.) saxatilis* Skuse, 1890 (see Theischinger 1994 for more details on these species). *Dicranomyia (D.) globosa* most closely resembles *D. (D.) saxatilis*, especially in the wing patterning, but is readily distinguished from *D. (D.) saxatilis* and other similar species by the long spines on the rostral prolongation of the outer gonostylus.

## *Dicranomyia (Dicranomyia) monacha* Alexander 1953

Figs 33–35

**Material examined.** New South Wales: 5♂♂, Katoomba, Megalong Creek above Bonnie Doon Falls (33.710°S 150.293°E), 18 Sep 2017, Z. Billingham & G. Theischinger, GHD (T18150–T18154); 1♂, Leura, Gordon Creek off Lyrebird Dell Walking Track (33.724°S 150.335°E), 19 Sep 2017, Z. Billingham & G. Theischinger, GHD (T17821); 1♂, Leura, Leura Falls Creek off Leura Cascades Walking Track (33.720°S 150.323°E), 19 Sep 2017, Z. Billingham & G. Theischinger, GHD (T18004); 2♂♂, Lawson, Tributary of Blue Mountain Creek off Dante's Glen Walking Track (33.712°S 150.423°E), 20 Sep 2017, Z. Billingham & G. Theischinger, GHD (T17787–T17788); 3♂♂, Wentworth Falls, Valley of the Waters Creek off Valley of the Waters Walking Track (33.718°S 150.357°E), 20 Sep 2017, Z. Billingham & G. Theischinger, GHD (T18289–T18291); 1♂, Lawson, Cataract Creek off South Lawson Waterfall Circuit Walking Track (33.732°S 150.440°E), 21 Sep 2017, Z. Billingham & G. Theischinger, GHD (T19406); 7♂♂, Falconbridge, Sassafras Creek off Victory Creek by Clarinda Falls (33.701°S 150.542°E), 22 Sep 2017, Z. Billingham & G. Theischinger, AM (K.394964); 2♂♂, State Mine Gully, Farmers Creek off Bells Rd by Oakey Park Water Treatment Plant (33.464°S 150.193°E), 23 Sep 2017, Z. Billingham & G. Theischinger, GHD (T19212–T19213); 1♂, Gordon, Blackbutt Creek off Blackbutt Creek Walking Track (33.759°S 151.142°E), 25 Sep 2017, Z. Billingham & G. Theischinger, GHD (T18441); 1♂, Ku-Ring-Gai Chase, McCarrs Creek by Upper Gledhill Falls off McCarrs Creek Rd (33.663°S 151.250°E), 25 Sep 2017, Z. Billingham & G. Theischinger, GHD (T18498); 1♂, St. Ives, Rocky Creek at Governor Phillip Reserve off Eastern Arterial Rd (33.751°S 151.170°E), 25 Sep 2017, Z. Billingham & G. Theischinger, GHD (T19287); 1♂, Macquarie Pass, Tributary of Macquarie Rivulet off by Cascade Falls off Cascade Walking Track (34.568°S 150.676°E), 29 Sep 2017, Z. Billingham & G. Theischinger, GHD (T17466); 3♂♂, Fitzroy Falls, Yarrunga Creek off West Rim Walking Track (34.647°S 150.468°E), 30 Sep 2017, Z. Billingham & G. Theischinger, GHD (T19765–T19767); 1♂, Robertson, Missingham Creek off Nellies Glen Walking Track (34.621°S 150.654°E), 30 Sep 2017, Z. Billingham & G. Theischinger, GHD (T18308); 1♂, Buckenbowra, Sugarloaf Creek off Misty Mountain Rd (35.563°S 150.009°E), 1 Oct 2017, Z. Billingham & G. Theischinger, GHD (T19944).

**Remarks.** Alexander (1933) described *D. (D.) whitei brevispinula* as a subspecies of *D. (D.) whitei* Alexander, 1921, then later (Alexander, 1953) renamed the species *D. (D.) whitei monacha* due to recognized homonymy. In the review of Australian *Dicranomyia* by Theischinger (1994) it was again treated as a subspecies of *D. (D.) whitei*, however Oosterbroek (2021) regards it as a distinct species due to partial sympatry with *D. (D.) whitei*, and this elevation from



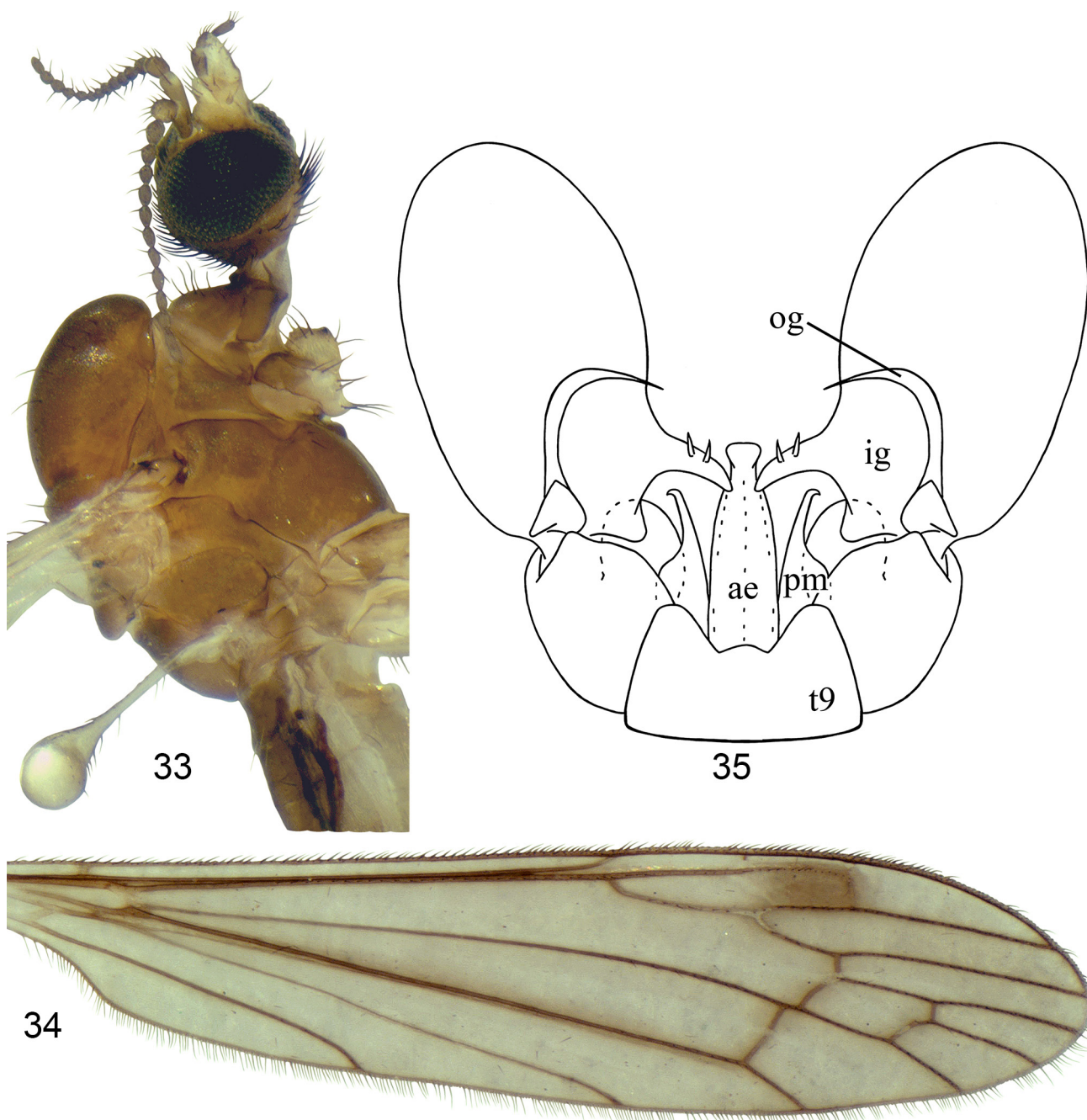
Figures 29–32. *Dicranomyia (Dicranomyia) globosa* sp. nov., male. (29) head and thoracic colouration, lateral; (30) wing; (31, 32) hypopygium, dorsal view.

sub-species is adopted here. The holotype material was not in a suitable condition for Theischinger (1994) to include a figure of the hypopygium, however this is now possible with the availability of fresh material.

**Male.** In addition to the figure of the hypopygium (Fig. 35) photographs are included to show the head and lateral thoracic colouration (Fig. 33), and the wing (Fig. 34).

**Discussion.** *Dicranomyia (D.) monacha* and *D. (D.) whitei* are distinct among Australian species of *Dicranomyia* in having T9 strongly bilobate, with deep trapezoidal excision separating the lobes. *Dicranomyia (D.) monacha* is readily distinguished from *D. (D.) whitei* by the generally smaller size and lighter body colouration, and by the considerably shorter spines on the rostral prolongation of the inner gonostylus.





Figures 33–35. *Dicranomyia (Dicranomyia) monacha*, male. (33) head and thoracic colouration, lateral; (34) wing; (35) hypopygium, dorsal view.

*Elephantomyia (Elephantomyodes) fumicosta*

Alexander, 1922

Figs 36–40

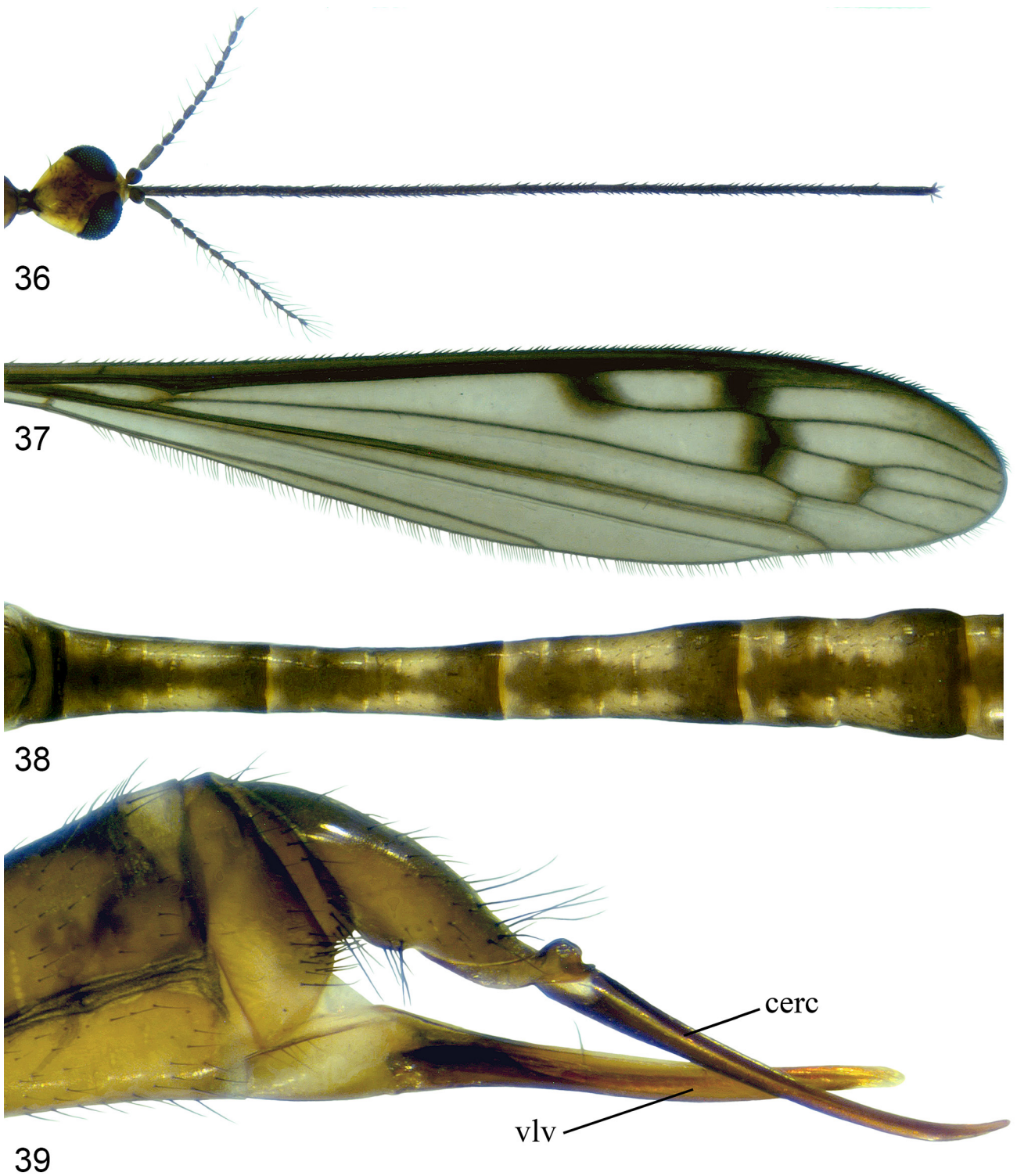
**Material examined.** New South Wales: 1♂, 3♀♀, Dooragan National Park, North Brother Mtn, 450 m, subtropical rainforest, 28 Jan–13 Feb 1999, G. Williams, Malaise trap (ZB); 1♀, Upper Avon, Wilsons Creek off Upper Avon Rd (32.129°S 151.844°E), 10 Nov 2018, Z. Billingham & G. Theischinger, GHD (T23120); 1♀, Dingo Forest, Little Run Creek off Potoroo Forest Rd by Potoroo Falls (31.732°S 152.144°E), 15 Nov 2018, Z. Billingham & G. Theischinger, GHD (T22260); 1♀, Crawford River,

Tributary of Crawford River off Knob Rd (32.365°S 152.106°E), 17 Nov 2018, Z. Billingham & G. Theischinger, GHD (T21856);. **Queensland:** 1♂, Lamington National Park, Green Mountains, Earthwatch Australia (ZB); 1♂, Mt Finnigan, 14 May 1981, D. H. Colless (ZB).

**Remarks.** Alexander (1922) described the male of *E. (E.) fumicosta*, however did not provide a detailed description of the hypopygium. With the availability of fresh material a thorough description of the hypopygium is now possible, along with notes on the female of *E. (E.) fumicosta*.

Photographs are included to show the head and rostrum (Fig. 36), the wing (Fig. 37), the dorsal abdominal colouration (Fig. 38) and the ovipositor (Fig. 39). A figure of the hypopygium (Fig. 40) is also provided.





Figures 36–39. *Elephantomyia* (*Elephantomyodes*) *fumicosta*, female. (36) head and rostrum, dorsal; (37) wing; (38) abdominal colouration, dorsal; (39) ovipositor.

**Male.** Hypopygium with tergite and sternite greyish brown, gonocoxites yellowish brown. Distal margin of T9 with deep trapezoidal excision. T10 with lateral margins lightly sclerotized, otherwise membranous, forming a rounded cone extending to about  $\frac{1}{2}$  length of the gonocoxites and covering much of the aedeagal complex. Gonocoxite about  $1\frac{1}{2}$  times the length of T9, base broad, narrowing in distal half, with numerous long setae, those on mesal surface quite fine. Outer

gonostylus lightly sinuous, strongly sclerotized towards the sharply pointed, bifid tip. Inner gonostylus strongly curved at about half its length, tip blunt, rounded. Interbase about  $\frac{1}{3}$  the length of the gonocoxite, blade-like, the tip blunt, outer edge smooth, inner edge somewhat irregular, a low bulge at midlength. Paramere with two arms, the lower arm short and articulating with the interbase, upper arm about  $\frac{2}{3}$  length of the gonocoxite, lightly sinuous, tip spatulate and

with medial edge lightly pointed. Basal apodeme of aedeagus fan-shaped. Aedeagus broad at base, extending just beyond the gonocoxite then becoming narrower, curving back on itself and coiling many times, its total length indeterminable.

**Female.** Size much the same as for male. Body colouration generally similar to male, the abdominal tergites each with a central longitudinal brown stripe in addition to the terminal brown cross bands described for the male. Ovipositor with tenth tergite deep brown, sternite lighter yellowish brown. Cercus long and mostly straight, abruptly curved dorsad towards the tip. Tip of hypogynial valve reaching to about  $\frac{1}{2}$  length of cercus.

**Discussion.** The Australian species of *Elephantomyia* are readily distinguished from the majority of limoniid genera by the exceptionally elongate rostrum, with only *Toxorhina* possessing a similarly long rostrum; these two genera can be separated by features of the wing venation using the key provided in Theischinger (1996).

Only two species of *Elephantomyia* are known in Australia, *E. (E.) fumicosta* from eastern Queensland and north eastern New South Wales and the more southerly distributed *E. (E.) tasmaniensis* Alexander, 1928, from New South Wales, Victoria, and Tasmania, the two species distributions overlapping in the Barrington Tops region of New South Wales. The darkly pigmented costal and subcostal cells of the wing readily distinguish *E. (E.) fumicosta* from *E. (E.) tasmaniensis*, which has only lightly pigmented costal cells.

The length and width of the inner gonostylus seems somewhat variable between specimens of *E. (E.) fumicosta*, in some cases shorter and broader, in others longer and narrower. However, in the absence of other differences between specimens, this variation in the inner gonostylus is not considered sufficient to regard individuals as non-conspecific.

## *Orimarga (Orimarga) joana* Alexander, 1926

Figs 41–44

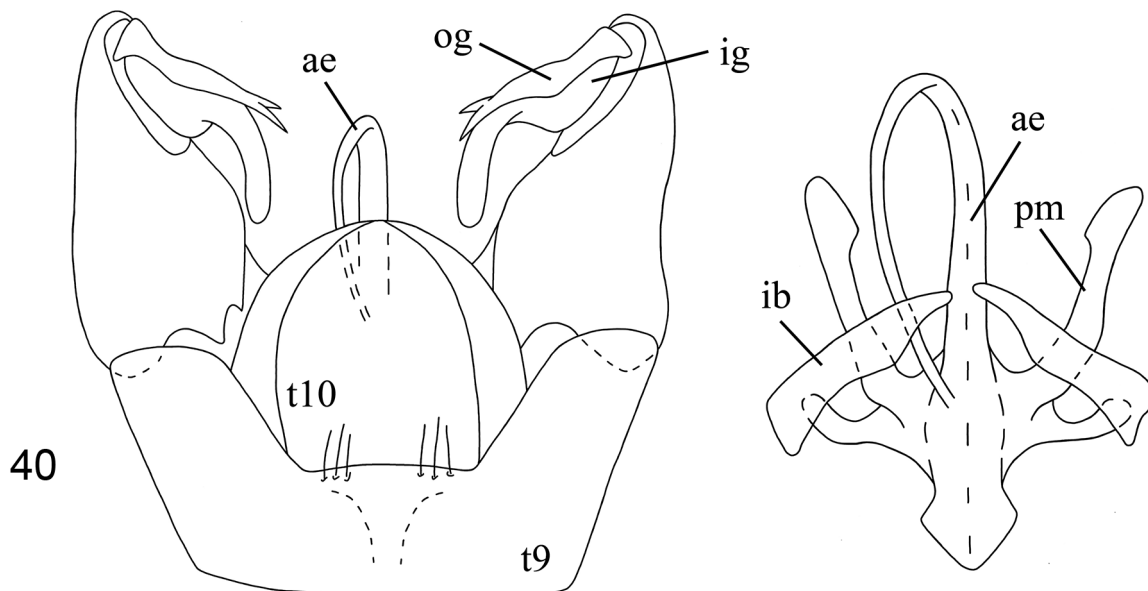
**Material examined.** New South Wales: 1♂, 1♀, Gordon, Blackbutt Creek off Blackbutt Creek Walking Track (33.759°S 151.142°E), 25 Sep 2017, Z. Billingham & G. Theischinger, GHD (T1824–T1825); 1♀, Lane Cove, Tributary of Gore Creek off Walking Track at Osborne Rd (33.823°S 151.179°E), 26 Sep 2017, Z. Billingham & G. Theischinger, GHD (T18565); 1♀, Kembla Heights, American Creek off Cordeaux Rd (34.437°S 150.795°E), 19 Nov 2018, Z. Billingham & G. Theischinger, GHD (T21739).

**Remarks.** Alexander (1926) described *O. (O.) joana* from a unique female, leaving the male of the species undescribed. With the availability of fresh material general notes on the male and a description of the hypopygium are now possible.

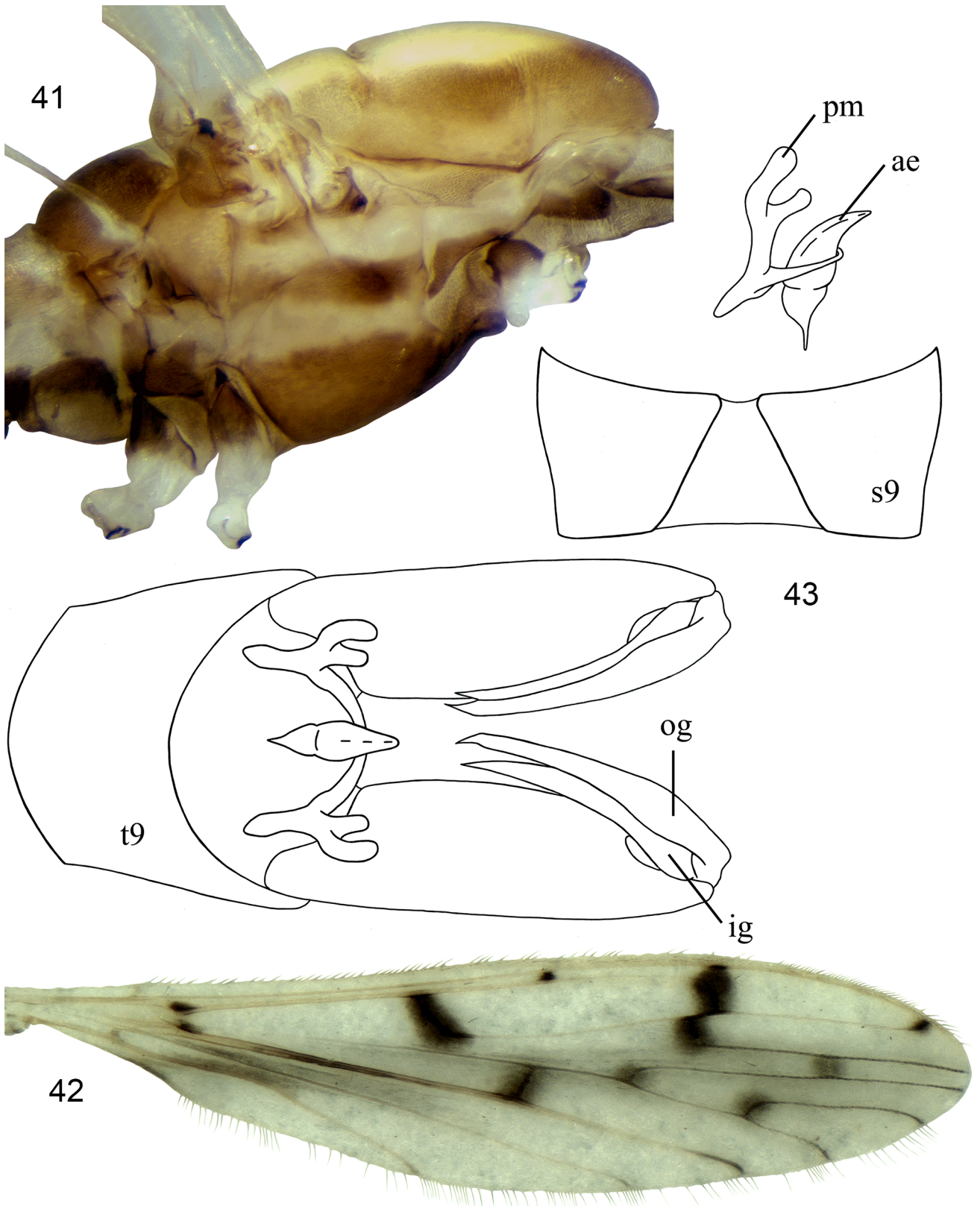
Photographs are included to show a lateral view of the thoracic colouration (Fig. 41), the wing (Fig. 42), and the ovipositor (Fig. 44). A figure of the hypopygium (Fig. 43) is also provided.

**Male.** Size and colouration much as described for female. Hypopygium largely yellowish brown. Distal margin of T9 broadly concave, sternite with triangular medial membranous area, narrowest at the distal margin. Gonostyli narrow and blade-like, the outer gonostylus faintly dilated towards base, weakly hooked at tip, inner gonostylus more simple, styli about  $\frac{2}{3}$  the length of the elongate gonocoxites. Aedeagus short and curving ventrad, posterior bridge of parameres narrow, dorsal arm of parameres with two short, bluntly tipped branches, the terminal branch a little larger.

**Female.** Size and colouration much the same as for male. Ovipositor with tergite yellowish brown, sternite dark brown. Cercus quite short, lightly curved. Tip of hypogynial valve reaching to about  $\frac{3}{4}$  length of cercus.



**Figures 40.** *Elephantomyia (Elephantomyodes) fumicosta* male, hypopygium, dorsal view, with aedeagal complex inset, coiled extent of aedeagus excluded.



**Figures 41–43.** *Orimarga joana*, male. (41) thoracic colouration, lateral; (42) wing. (43) hypopygium, dorsal view, with aedeagal complex and sternite 9 inset.





Figure 44. *Orimarga joana* female, ovipositor, lateral.

**Discussion.** Only three species of *Orimarga* are known from Australia, seemingly occurring only in New South Wales from the Sydney-Blue Mountains area to the area around Wollongong. *Orimarga (O.) joana* is readily distinguished from *O. (O.) australis* Skuse, 1890, and *O. (O.) inornata* Skuse, 1890, by the patterned wings, particularly the coloured stigma, and by the unusual placement of crossvein r-m, at nearly  $\frac{1}{2}$  the length of  $R_{4+5}$ , the vein occupying a much more basal position in *O. (O.) australis* and *O. (O.) inornata*.

### *Thrypticomya aureipennis* Skuse, 1890

Figs 45–47

**Material examined.** **New South Wales:** 1♂, Gordon, Blackbutt Creek off Blackbutt Creek Walking Track (33.759°S 151.142°E), 25 Sep 2017, Z. Billingham & G. Theischinger, GHD (T18428); 2♂♂, 1♀, Killarney Heights, Bates Creek by Bates Creek Falls off Bates Creek Walking Track (33.769°S 151.221°E), 27 Sep 2017, Z. Billingham & G. Theischinger, GHD (T17537–T17539); 1♂, East Lindfield, Moores Creek off Little Digger Walking Track (33.770°S 151.193°E), 27 Sep 2017, Z. Billingham & G. Theischinger, GHD (T17584); 1♂, Mount Royal, Fal Brook off Cassels Rd (32.160°S 151.315°E), 5 Nov 2018, Z. Billingham & G. Theischinger, GHD (T23200); 1♂, Girvan, Boomerang Creek off Booral Rd (32.456°S 152.102°E), 17 Nov 2018, Z. Billingham & G. Theischinger, GHD (T22335). **Victoria:** 3♂♂, Mallacoota, Foreshore Camping Park (37.556°S 149.759°E), 21 Sep 2011, Z. Billingham, GHD (T02929–T02931); 6♂, Cabbage Tree Creek, Little Cabbage Tree Creek off Tarlton Track (37.651°S 148.693°E), 7 Jan 2015, Z. Billingham, GHD (T10539–T10544); 1♂, Bellbird Creek, Jungle Creek off Princes Hwy (37.652°S 148.813°E), 7 Apr 2018, Z. Billingham, GHD (T20978).

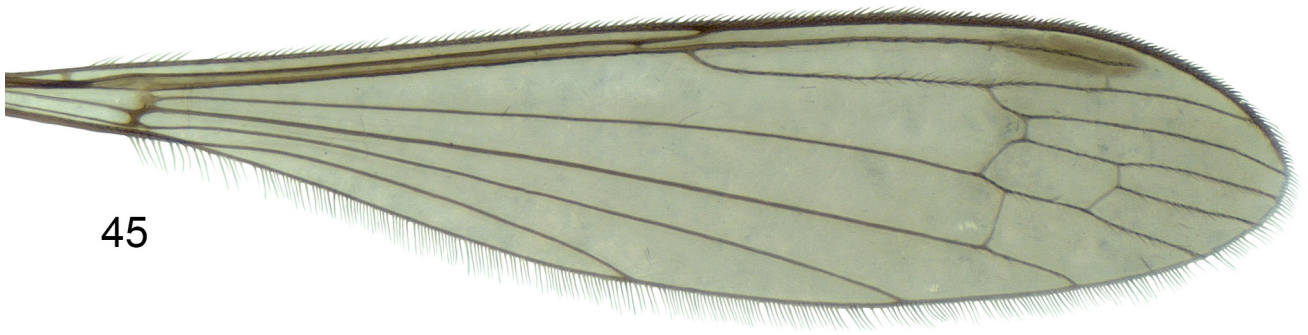
**Remarks.** The description of *T. aureipennis* provided by Skuse (1890) did not include a detailed description or figure of the hypopygium, making comparison with other species in the genus difficult. The availability of fresh material of *T. aureipennis* now allows for a thorough description of the hypopygium, a description of the ovipositor and provision of figures to aid in identification.

Photographs are included to show the wing (Fig. 45), and a lateral view of the ovipositor (Fig. 47). A dorsal view of the hypopygium (Fig. 45) is also provided.

**Male.** Hypopygium with tergite and sternite yellowish brown, gonocoxites darker greyish brown, lobe of inner gonostylus greyish white. Distal margin of T9 moderately bilobed, with broad U-shaped concavity. Ventral lobe of gonocoxite elongate, tip blunt, subequal to length of gonocoxite. Inner gonostylus  $1\frac{1}{2}$ –2 times the length of gonocoxite, lobe swollen, rounded, with an ovoid sclerite on dorsal face, two spines set on the medial edge of ovoid sclerite, each arising from a prominent tubercle, one at the base of the sclerite, one higher, rostral prolongation short, arched, tapering to a narrow tip. Outer gonostylus an evenly arched rod, narrowing gradually to a sharp tip. Aedeagus exceeding length of gonocoxite, parameres about  $\frac{3}{4}$  the length of the aedeagus, lateral lobe low and rounded, mesal lobe gradually tapering to a blunt tip.

**Female.** Size and colouration much the same as for male. Ovipositor with tergite and sternite largely brownish. Cercus of moderate length, lightly curved. Tip of hypogynial valve reaching to about  $\frac{3}{4}$  length of cercus.

**Discussion.** Five species of *Thrypticomya* are known from Australia, predominantly from the Cairns area of northern Queensland, with *T. aureipennis* seemingly the only species extending south beyond Queensland. The Australian species are readily distinguished by features of the wing: *T. marksae* Alexander, 1956, having the discal medial cell open, all other species with discal medial cell closed; *T. fumidapicalis* Alexander, 1921, with clouded dark pigmentation in apical  $\frac{1}{5}$  of wing, remaining species may have greyish suffusion to the wing or darkened areas but not with the wing tip prominently darkened; *T. microstigma* Alexander, 1921, with Sc ending well before origin of Rs and stigma greatly reduced, in other species Sc close to origin of Rs and stigma more prominent; *T. doddi* Alexander, 1921, and *T. aureipennis* very similar, differing in placement of a cross-vein between the costa and R, this cross-vein considered as the tip of  $R_1$  by Alexander (1927), being only a short distance before  $R_2$  in *T. doddi*, while in *T. aureipennis* it is set further from  $R_2$ , towards the proximal edge of the stigma.

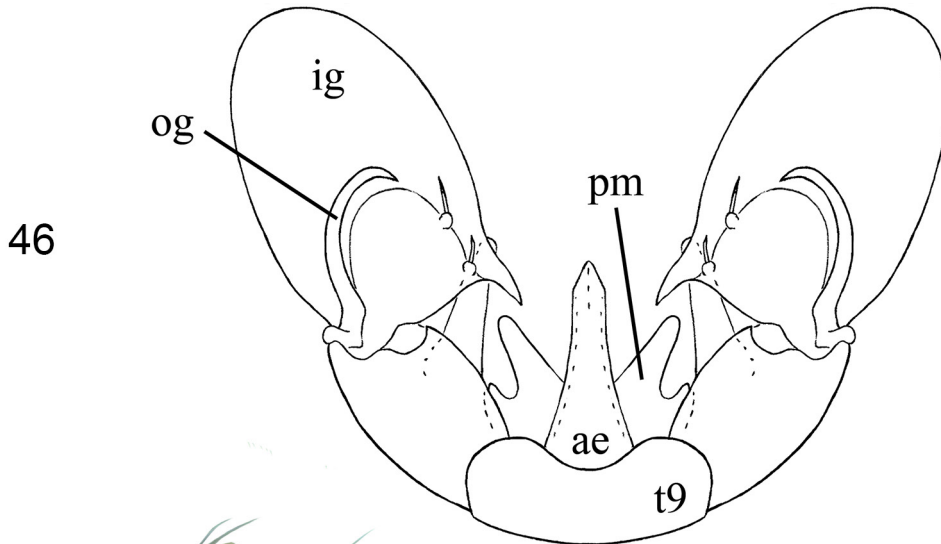


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Figure 45. *Thrypticomya aureipennis* male, wing.

Beyond Australia *T. aureipennis* is also known from Vanuatu and Samoa, with minor variations across the three populations, prompting Edwards (1928) to suggest that individuals from Vanuatu and Samoa represent distinct varieties of the species. The Vanuatuan individuals have the rostral spines of the inner gonostylus closer together and on lower, less distinct, tubercles than in Australian individuals

(Edwards, 1927). While the Samoan variety differs from the Australian form in having somewhat dusky wings with a less prominent stigma (Edwards, 1928). Furthermore, both Vanuatuan and Samoan varieties have the ventral lobe of the gonocoxite shorter and broader than in Australian individuals (Edwards, 1928), where it is comparatively elongate, subequal in length to that of the gonocoxite.



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Figures 46–47. *Thrypticomya aureipennis*. (46) male, hypopygium, dorsal view; (47) female, ovipositor, lateral.

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