



## New species of *Metatrichia* Coquillett (Diptera: Scenopinidae) from Australia and Venezuela

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### Abstract

Two new species of the cosmopolitan genus *Metatrichia* Coquillett are described. *Metatrichia dhimurru* **sp. nov.** is described from Arnhem Land (Northern Territory), Australia and represents the third species of the genus to be described from the Australasian region. *Metatrichia venezuelensis* **sp. nov.** from Venezuela is the third extant species of the genus to be described from the New World.

**Key words:** *Metatrichia*, Asiloidea, Therevoid clade, Scenopinidae

### Introduction

Scenopinidae (window flies) are a small family (*ca.* 420 species in 24 genera) of asiloid flies distributed on all continents except Antarctica. This family is closely related to Therevidae (stiletto flies) based on the characteristic secondarily segmented larval abdomen. Scenopinids are typically very small insects, frequently less than 5 mm in total body length. Adults are known to feed at flowers and honey dew, while larvae are predators in sandy soils and leaf litter, although larvae of some species have been reared from wood boring beetle galleries, bird nests and small mammal burrows (Kelsey 1969).

*Metatrichia* Coquillett is a cosmopolitan genus comprising 14 extant species with at least one species described from each biogeographic region. The Palaearctic Region is the most species rich with six species described: *M. asiatica* Krivosheina & Krivosheina, 1999, *M. bilituua* Kelsey 1981b, *M. deserticola* Krivosheina & Krivosheina, 1999, *M. friedbergi* Krivosheina & Krivosheina, 1999, *M. mongolica* Kesley, 1981a and *M. palaestinensis* (Kröber, 1937). A single species is described from the Oriental Region (*M. thailandica* Kelsey, 1970), and three species from the Afrotropical Region (*M. lophyrosoma* (Speiser, 1920), *M. nigeriana* Kelsey, 1984 and *M. stevensoni* (Bezzi, 1925)). Two species are known from the Australasian Region, *M. waterhousei* (Paramonov, 1955) from Australia and *M. papuana* Kelsey, 1970 from Papua New Guinea. In the New World there are two extant described species: the Neotropical *M. robusta* Kröber, 1913 and Nearctic *M. bulbosa* (Osten Sacken, 1877). A single fossil species (*M. pria* Yeates & Grimaldi, 1993) is known from several Dominican amber inclusions.

*Metatrichia* appears closely related to *Pseudomphrale* Kröber, 1913 and *Caenoneura* Kröber, 1923 based on various external and genitalic characters. While *Caenoneura* is highly autapomorphic, the morphological distinction between *Metatrichia* and *Pseudomphrale* is not easily defined. Krivosheina & Krivosheina (1996) questioned the validity of the *Pseudomphrale* with respect to *Metatrichia*, after examining the types of all but

one species of the genus. They noted that Kröber (1913) erected *Pseudomphrale* based on the literature and never studied any specimens. It is also worth noting that four species of *Metatrichia* were originally described in *Pseudomphrale* (Krivosheina & Krivosheina 1996). Hassan & El Hawagry (2001) subsequently described a new species, *Pseudomphrale miramisho* Hassan & El Hawagry, from Egypt and transferred *Stenomphrale flavoscutellata* Kröber to *Pseudomphrale*, increasing the number of described species to five. The validity of *Pseudomphrale* remains unclear and awaits clarification by locating and examination of the [apparently] lost type of *P. clausa* (Loew), the type species for the genus (Krivosheina & Krivosheina 1996). If *Pseudomphrale* is found to be a synonym of *Metatrichia* then these species will ultimately be transferred to *Metatrichia* as well. At present *Metatrichia* can be differentiated from other window fly genera (except *Pseudomphrale*) by the following characters: wing cell r5 closed (i.e. vein  $M_{1+2}$  meeting  $R_5$  before wing margin); relatively large body size; abdomen broadly flattened and blunt apically in both sexes; body frequently covered in white scale-like setae; hypandrium present as paired spatulate sclerites; ejaculatory apodeme broadly spatulate; female terminalia with acanthophorite spines absent.

In this paper a third Australasian species, *Metatrichia dhimurru* sp. nov., is described from a single male collected in northern Australia. A third New World species, *M. venezuelensis* sp. nov., represented by male and female specimens collected from Venezuela is also described. Addition of the two species presented here increases the number of species to seventeen (extinct and extant). Previous keys to species of *Metatrichia* have been published by Kelsey (1969) and Krivosheina & Krivosheina (1999) (Palaeartic species only). A revised key to all *Metatrichia* species is not presented here as a complete revision of both *Metatrichia* and *Pseudomphrale* is warranted, although dichotomous keys to both New World and Australasian species are presented and both new species described herein are diagnosed relative to all other *Metatrichia*.

## Materials and methods

Male genitalia were macerated in 10% KOH at room temperature for one day to remove soft tissue, then rinsed in distilled water with dilute acetic acid, and dissected in 80% ethanol. Preparations were then placed into glycerine and glycerine gel, with images made with the aid of a digital camera mounted on a stereomicroscope. Genitalia preparations were placed in glycerine in a genitalia vial mounted on the pin beneath the specimen. Types are deposited in the Australian National Insect Collection (ANIC) in Canberra, Australia and the United States National Museum Natural History (NMNH), in Washington D.C., USA. Adult morphological terminology follows McAlpine *et al.* (1981) and genitalic morphology by Krivosheina & Krivosheina (1996) and Winterton (2005).

## Taxonomy

### *Metatrichia dhimurru* sp. nov.

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(Figs. 1–3, 8A–B)

**Type material.** Holotype male, AUSTRALIA: Northern Territory: Arnhem Land [Gove Peninsula], 12° 25.779'S, 136° 49.616'E; S.L. Winterton; 18.viii.2007; 14m amsl; monsoon forest in sand dunes (ANIC).

**Diagnosis.** Body uniform black colour, covered with white scale-like setae; legs black; wing hyaline; abdomen without ivory-white patches on tergites 5–8; gonostylus crescent-shaped.

**Description.** Body length 3.5 mm. *Head.* Glossy black; frons covered with silver-white setae; frons slightly protruding anteriorly, almost contiguous dorsally, face black, parafacia narrow, glabrous; mouthparts well developed, brown; antenna black-brown, overlain with silvery pubescence, admixed with short dark setae on scape and pedicel; ocellar tubercle slightly raised, overlain with silvery pubescence; postocular ridge

very narrow, without macrosetae; occiput relatively flat with minute setae laterally; gena covered with short dark and pale setae. *Thorax*. Glossy black, scutum densely overlain with silver-white setae, setae scale-like anteriorly and laterally; small pale ridges on postpronotal and pteropleural calli; pleuron densely overlain with silver-white setae on anepisternum and katepisternum, setae scale-like on anepisternum; legs black with pale setae on coxae and femora; haltere brown with pale area ventrally; wing hyaline, venation brown. *Abdomen*. Black, slightly dorso-ventrally flattened; covered with black pubescence dorsally; densely overlain with white setae laterally and ventrally, admixed laterally with white, scale like-setae; postero-medial margins of tergites 6–7 slightly pale. *Male genitalia* (Figs. 8A–B). Epandrium band-like, with posteriorly directed margins ventrally, halves not completely covering gonocoxites ventrally, sclerotised along medial margins; cerci flap-like and directed ventrally over hypoproct; gonocoxite with medially directed triangular process along ventral surface; gonocoxal apodeme relatively narrow in lateral view; gonostylus crescent-shaped with setae along medial margin; hypandrium in two halves, posteriorly directed knob-like process medially; distiphallus short, broad with briefly narrowed apex, bifurcating arms of distiphallus divergent in ventral view; ventral apodeme of parameral sheath deflexed ventrally; ejaculatory apodeme large, spatulate.



**FIGURE 1.** *Metatrachia dhimurru* sp. nov., male, Arnhem Land, Northern Territory (Body length = 3.5 mm) (Photo: S.L. Winterton).

**Comments.** *Metatrachia dhimurru* is known from a single male specimen collected in monsoon forest nestled between sand dunes on the Gove Peninsula, Northern Territory (Australia). This species is very closely related to *M. waterhousei* based on male genitalia characters such as distiphallus and gonostylus shape, but clearly differs externally by the absence of ivory patches on the abdomen. *Metatrachia dhimurru* differs from *M. papuana* by the presence of scale-like setae on the head and thorax and hyaline wings; scale-like setae are absent and wings darker in the latter species (Kelsey 1970).

**Etymology.** The specific epithet is named after the Dhimurru people of Arnhem Land (Northern Territory).

#### Key to extant species of *Metatrachia* from the Australasian region

1. Body without white, scale-like setae (female only) (Papua New Guinea) ..... *M. papuana* Kelsey
- Body with numerous white, scale-like setae on head thorax and abdomen ..... 2
2. Male abdominal tergites 5–7 with cream-white markings; postalar callus and sclerites around wing base with tan-brown markings (eastern Australia) ..... *M. waterhousei* (Paramonov)

- Male abdominal tergites 6–7 with faint markings; postalar callus and sclerites around wing base uniformly dark (male only) (northern Australia) ..... *M. dhimurru* **sp. nov.**



**FIGURE 2.** *Metatrachia dhimurru* **sp. nov.**: Holotype male, dorsal. Body length = 3.5 mm.

***Metatrachia venezuelensis* sp. nov.**

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(Figs. 4–7, 8C–D)

**Type material.** Holotype male, VENEZUELA: Guarico, 10 km E. of Calabozo, 18.iii.1982, G.F & J.F. Hevel (NMNH).

Paratypes, VENEZUELA: 3 females, Guarico, 10 km E. of Calabozo, 18.iii.1982, G.F & J.F. Hevel (NMNH).

**Diagnosis.** Thorax black with pale brownish areas on pleura and yellowish-cream colouration on postpronotal lobes, postalar calli, a narrow notopleural stripe, and posterior part of anepimeron and anterior part of katatergite; head with lower frons and face pale cream coloured; head and body with extensive white scale-like setae; abdomen tan coloured, without ivory-white patch on tergites.

**Description.** Body length: male 4.0 mm, female 3.9–5.0 mm. *Head.* Glossy black, lower frons and face pale cream-white coloured, light brown around base of antenna; white scale-like setae on frons, ocellar tubercle and occipital margins; frons narrowed dorsally so that eyes briefly contiguous in male, female frons wider than ocellar tubercle at narrowest point and slightly protruding anteriorly; ocellar tubercle raised; occiput flat to slightly concave; male with postocular ridge narrow, without macrosetae, female with postocular ridge broad, rounded and covered with white scale-like setae; gena covered with short pale setae; parafacia narrow, glabrous; mouthparts well developed, dark brown; antenna light brown, overlain with very short silvery pubescence. *Thorax.* Prothorax largely tan, scutum, scutellum, most of anepisternum, entire katepisternum, anterior part of anepimeron and lower part of meron black, yellowish-cream colouration present on postpronotal lobe, postalar callus, a narrow notopleural stripe that extends onto dorsal portion of anepisternum and katatergite; scutum, scutellum, anepisternum, and katepisternum overlain with silver-white, scale-like setae; coxae, and legs brown with pale setae on coxae and femora, tarsomeres pale basally; haltere stem light brown with cream knob; wing whitish in male with pale veins, hyaline with darker veins in female. *Abdomen.* Light tan-brown, paler laterally, overlain with very short glaucous pubescence dorsally, without any scale-like setae; posterior margins of tergites 1–7 cream coloured, short pale setae laterally. *Male genitalia* (Figs. 8C–D): Epandrium sub-triangular in lateral view, halves not completely covering gonocoxites ventrally, sclerotised along posteromedial margins; cerci tubular around hypoproct; gonocoxite with narrow, medially directed triangular process along ventral surface; gonocoxal apodeme relatively broad and spatulate in lateral view; gonostylus narrowly triangular; hypandrium in two halves, posteriorly directed knob-like process medially; distiphallus short, broad with briefly narrowed apex, bifurcating arms of distiphallus slightly divergent in ventral view; ventral apodeme deflexed ventrally; ejaculatory apodeme large, spatulate.



**FIGURE 3.** *Metatrichia dhimurru* sp. nov.: Holotype male, lateral. Body length = 3.5 mm.





**FIGURE 4.** *Metatrachia venezuelensis* sp. nov.: Holotype male, dorsal. Body length = 4.0 mm.



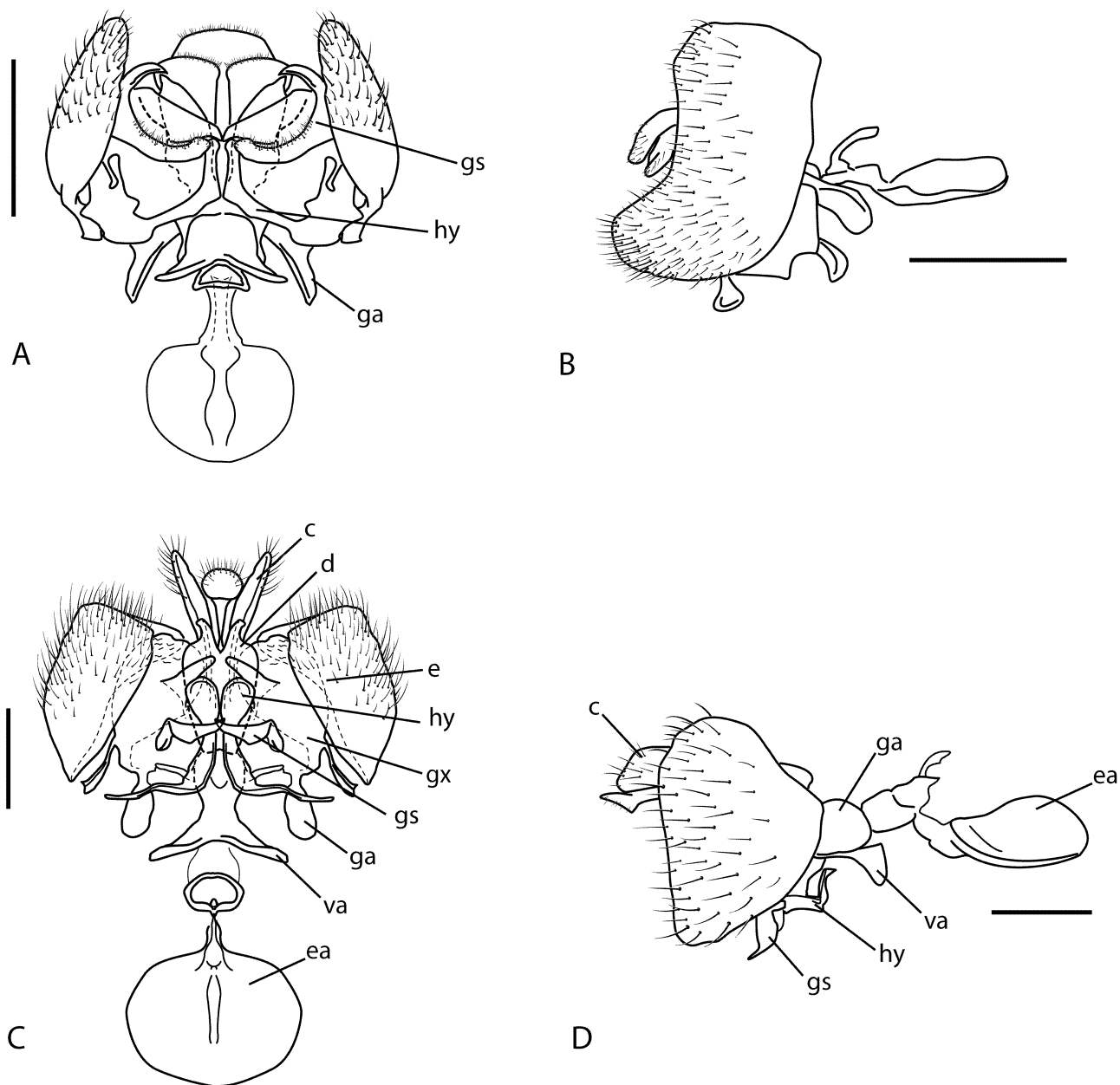
**FIGURE 5.** *Metatrachia venezuelensis* sp. nov.: Holotype male, lateral. Body length = 4.0 mm.



**FIGURE 6.** *Metatrachia venezuelensis* sp. nov.: Paratype female, dorsal. Body length = 4.5 mm.



**FIGURE 7.** *Metatrachia venezuelensis* sp. nov.: Paratype female, lateral. Body length = 4.5 mm.



**FIGURE 8.** *Metatrachia dhimurru* sp. nov.: A, male genitalia, dorsal view; B, same, lateral view. *Metatrachia venezuelensis* sp. nov.: C, male genitalia, dorsal view; D, same, lateral view. Abbreviations: *c*, cercus; *d*, distiphallus; *e*, epandrium; *ea*, ejaculatory apodeme; *ga*, gonocoxal apodeme; *gs*, gonostylus; *gx*, gonocoxite; *hy*, hypandrium; *va*, ventral apodeme. Scale lines: 0.2 mm.

**Etymology.** The specific epithet refers to the country of origin of this species.

**Comments.** We are presenting a key here to the extant species of *Metatrachia* from the New World, primarily to show the differences between *M. venezuelensis* and the other two species found in the region, *M. bulbosa* and *M. robusta*. However, we are cognizant of the fact that additional Neotropical *Metatrachia* species remain undescribed, as noted below.



## Key to extant species of *Metatrichia* from the New World

1. Legs tan-brown; abdomen generally tan coloured with posterior margins of tergites 1–7 cream-coloured; abdomen without scale-like setae; notopleural region of pleura cream; knob of haltere cream; wings of female hyaline.....  
..... *M. venezuelensis* **sp. nov.**
- Legs very dark brown to black; abdomen black, sometimes with reddish-yellow colour laterally; abdomen with scale-like setae laterally; notopleural region of pleura black; knob of haltere whitish yellow to brown; wings of female with brownish infuscation ..... 2
2. Body uniformly black, sometimes end of abdomen vaguely brownish in females; knob of haltere primarily brown; widespread in United States to northern Mexico ..... *M. bulbosa* (Osten Sacken)
- Body largely black, but male abdomen (female unknown) with lateral margins of tergites 3–6 and entire tergite 7 reddish yellow; knob of haltere whitish yellow; known with certainty only from Paraguay ..... *M. robusta* Kröber

There has been confusion concerning the identity of *Metatrichia robusta*. Kelsey (1969: 215–219) described the female and illustrated both sexes of a species that he interpreted as *M. robusta*, with specimens primarily from Nova Teutonia, Brazil. He noted in his key (Kelsey 1969: 214) that his concept of *M. robusta* lacked scale-like hairs. However, Kröber (1913: 180), in his original description of *M. robusta*, mentioned scale-like hairs six times, noting their presence on the frons, thorax, and lateral areas of the abdomen. Clearly he was describing a different species than what Kelsey identified as *M. robusta*; Kelsey's material must represent an undescribed species. Unfortunately, the unique male of Kröber type originating from Paraguay was destroyed at the Hungarian Natural History Museum in 1956, so further characterization of true *M. robusta* will be possible only when additional specimens can be found.

We are also aware of another undescribed species of *Metatrichia* from South America. We have examined two females (Brazil, French Guiana, both in NMNH) that are black in colour but with the integument shinier than in *M. bulbosa*. It has scale-like setae on the frons and thorax, but not the abdomen; the scales are smaller than those found in the other New World species. It has the knob of the haltere dark brown. We are not describing it at present because males are not known.

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