Revision of the Australian bee fly genus *Sisyromyia* White, 1916 (Bombyliidae, Bombyliinae, Acrophthalmydini)

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Abstract

We review *Sisyromyia* White (Bombyliidae, Bombyliinae), a remarkable Australian endemic bee fly genus, which includes 11 species, including six species we describe as new here: *Sisyromyia albisquama* **sp. nov.**, *Sisyromyia angustivitta* **sp. nov.**, *Sisyromyia elongata* **sp. nov.**, *Sisyromyia maculipennis* **sp. nov.**, *Sisyromyia umbra* **sp. nov.**, *Sisyromyia vittata* **sp. nov.** The genus can be easily distinguished from other Australian genera in the subfamily by having a one-segmented antennal flagellum, subapex of flagellum with some long hairs; a pale median stripe present on the abdomen consisting of dense, decumbent short scales, cell *r*5 open; cell *br* nearly as long as cell *bm*, crossvein *m-m* located on base of cell *dm*; crossvein *m-m* long, nearly as long as crossvein *r-m*. We also recognized one new synonym, and propose a new combination for *Sisyromyia binghi* Evenhuis. A key to species of *Sisyromyia* is provided, and we extensively illustrate their internal and external morphology.

Key words: Australia, Bombyliidae, Acrophthalmydini, new species, new combination

Introduction

Sisyromyia White, 1916 is an endemic Australian bee fly genus belonging to the subfamily Bombyliinae (Bombyliidae). It can be easily distinguished from other Australian members of the subfamily by the contrasting pale median stripe on the abdomen consisting of dense, decumbent short scales, and the long hairs on the subapex of antennal flagellum.

Sisyromyia currently includes 12 described species (Evenhuis & Greathead, 1999), and is one of the most species-rich bombyliine genera in Australia. The monophyly of *Sisyromyia* is strongly supported by the presence of the unique median scale stripe, consisting of dense decumbent short scales; gonocoxite apex slightly narrower than base; gonocoxite elongate; ejaculatory apodeme narrow; spermatheca flattened; and spermatheca basal bulb combined with spermatheca (Li & Yeates, 2019a).

In Li & Yeates' (2019b) global morphological phylogeny of the Bombyliinae, *Sisyromyia* formed a monophyletic clade with the monotypic endemic western Australian genus *Paramonovius* Li & Yeates, and they were resolved as sister to the endemic Chilean genus *Acrophthalmyda* Bigot. Accordingly, these three genera were placed into the tribe Acrophthalmydini. Based on the ancestral area reconstruction, the divergence between *Acrophthalmyda* and *Sisyromyia* + *Paramonovius* was considered to be correlated to the separation of southern South America and Australia (52–35 Ma) (Li & Yeates, 2019b).

All the known species of *Sisyromyia* were described in mid to late 19 century and placed in various European genera, including *Bombylius*, *Systoechus* and *Sparnopolius* (Evenhuis & Greathead, 1999).

The genus *Sisyromyia* was established by White (1916) to accommodate two Tasmanian species, *Bombylius auratus* Walker and *Bombylius brevirostris* Macquart, and one synonym for each species was also recognized. Roberts (1928) revised the genus for the first time, and included another five species: he mentioned that the genus was comprised of six species and made a key for them; however, a total of seven species were redescribed or diagnosed in his text. Two of Roberts' (1928) newly included species have been subsequently removed: *Bombylius*

tetratrichus Walker was placed in *Meomyia* Evenhuis by Evenhuis & Greathead (1999); *Bombylius primogenitus* Walker was treated as unplaced species of Bombyliinae by Evenhuis & Greathead (1999), the latter more recently accommodated in *Dissodesma* Bowden & Li (Li & Yeates, 2018). None of the synonyms proposed by Roberts (1928) or White (1916) were recognised as such in catalogs (Evenhuis, 1989; Evenhuis & Greathead, 1999).

In this paper, we revise the species of *Sisyromyia* with the description of six new species. We also recognized one new synonym, and propose a new combination for *Sisyromyia binghi* Evenhuis. A key to species of *Sisyromyia* is provided.

Material and methods

Morphological terminology follows Cumming & Wood (2009) and Yeates (1994). The specimens were studied and illustrated with a Leica M80 microscope. Genitalic preparations were made by heating the apical portion of the abdomen in KOH at 100°C for 15–25min, and then washing in distilled water. After examination in glycerine, the dissections were transferred to a 70% glycerine and 30% ethanol mixture and stored in microvials pinned below the specimen. Photographs were taken using a Leica M205A microscope and stacked using Helicon Focus 5.3 (Kozub *et al.* 2000).

A list of abbreviations is as follows:

ANIC	Australian National Insect Collection, CSIRO National Research Collections Australia, Canberra, ACT, Australia
AM	Australian Museum, Sydney, NSW, Australia
MNHN	Museum National d'Histoire Naturelle, Paris, France
NHMUK	The Natural History Museum, London, UK
NHRS	Naturhistoriska Riksmuseet, Stockholm, Sweden
SMFD	Forschungsinstitut und Museum Senckenberg, Frankfurt, a.M., Germany
UNKN	Type depository unknown or not traced in this study
WAM	Western Australian Museum, Perth, WA, Australia
QM	Queensland Museum, Brisbane, Qld., Australia
ACT	Australian Capital Territory
NSW	New South Wales
Qld.	Queensland
SA	South Australia
Tas.	Tasmania
Vic.	Victoria
WA	Western Australia

Specimens are deposited in ANIC unless indicated otherwise.

Systematics

Family Bombyliidae

Subfamily Bombyliinae

Tribe Acrophthalmydini

Sisyromyia White, 1916

Sisyromyia White, 1916: 192, 197. Type species: *Bombylius auratus* Walker, 1849, by subsequent designation (Bezzi, 1924: 7).

Diagnosis (modified from Li & Yeates, 2018). Flagellum one-segmented, subapex with 1–5 long hairs. Base of wing vein *Cu* bare. Cell *r*5 open; cell *br* nearly as long as cell *bm*, crossvein *m-m* located on base of cell *dm*; crossvein *m-m* long, nearly as long as crossvein *r-m*; cell *cup* open. Abdomen with pale median stripe, consisting of dense, decumbent short scales. Male epandrium nearly rectangular, posterior half with long hairs. Hypandrium membranous. Gonocoxite elongate, basal half slightly wider than apical half; division short. Ejaculatory apodeme small. Gonocoxal apodeme short and pointed anteroventrally. Anterior arm of aedeagal sheath short, not extending beyond gonocoxal margin. Lateral ejaculatory process strong. Dorsal bridge without lateral hollow. Gonostylus normal. Phallus strong, slightly curved. Female sand chamber present. Tergite 8 with median apodeme on posterior margin, anterior margin with dense long hairs. Normally 20 to 30 acanthopore spines present on each side of tergite 9+10, slightly curved apically. Genital fork slender and straight, connected anteriorly. Sperm pump strong and short, clothed in longitudinal muscle, without lateral papillae. Sperm pump basal and apical collars small. Distal spermathecal duct short. Spermatheca large and flattened, basal bulb present.

Distribution. ACT, NSW, Qld., SA, Tas., Vic., WA.

Species included. *Sisyromyia albisquama* **sp. nov.**, *Sisyromyia angustivitta* **sp. nov.**, *Sisyromyia aurata* (Walker, 1849), *Sisyromyia decorata* (Walker, 1849), *Sisyromyia elongata* **sp. nov.**, *Sisyromyia limbata* (Bigot, 1892), *Sisyromyia maculipennis* **sp. nov.**, *Sisyromyia rutila* (Walker, 1849), *Sisyromyia thomsoni* Evenhuis & Greathead, 1999, *Sisyromyia umbra* **sp. nov.**, *Sisyromyia vittata* **sp. nov.**

Key to species of *Sisyromyia* White

1. Wing membrane dark brown on anterior half, hyaline on posterior half, with distinct margin 2
- Wing membrane hyaline to dark brown without distinct margin 3
2. Male eyes dichoptic; gap between inner apices of gonocoxites wide; inner apex of gonocoxite long
- *Sisyromyia decorata* (Walker, 1849)
- Male eyes holoptic; gap between inner apices of gonocoxites narrow; inner apex of gonocoxite short
- *Sisyromyia thomsoni* Evenhuis & Greathead, 1999
3. Anterior margin of scutellum with a band consisting of short white scales 4
- Anterior margin of scutellum without a band 7
4. Wing membrane dark brown, slightly lighter towards posterior margin *Sisyromyia umbra* **sp. nov.**
- Wing membrane at most slightly infuscated or with markings, never dark brown 5
5. Wing membrane without markings; abdominal tergites with short white scales laterally *Sisyromyia albisquama* **sp. nov.**
- Wing membrane with light markings; abdominal tergites without short white scales laterally 6
6. Male eyes connected; frons 2.8 x length of ocellar tubercle; gap between inner apices of gonocoxites wide; lateral margin of gonocoxite nearly straight *Sisyromyia limbata* (Bigot, 1892)
- Male eyes narrowly separated by 0.2 x width of ocellus; frons 1.8 x length of ocellar tubercle; gap between inner apex of gonocoxite narrow; lateral margin of gonocoxite strongly curved *Sisyromyia maculipennis* **sp. nov.**
7. Scutum with one dorsocentral stripe consisting of dense, decumbent short golden scales; abdominal tergites 2–6 with lateral stripe consisting of sparse, decumbent golden scales *Sisyromyia vittata* **sp. nov.**
- Scutum and abdominal tergites without stripes of scales as above 8
8. Body mostly covered in golden scales and hairs *Sisyromyia aurata* (Walker, 1849)
- Body mostly covered in reddish or brownish scales and hairs 9
9. Body mostly covered in brown hairs; wing membrane infuscated on anterior margin and darker towards wing base; abdominal tergites black except posterolaterally brown *Sisyromyia elongata* **sp. nov.**
- Body mostly covered in reddish hairs; wing membrane uniformly infuscated; abdominal tergites black 10
10. Flagellum 1.7 x as long as scape + pedicel, 2.7 x as long as scape; abdominal median stripe wide; inner apex of gonocoxite wide *Sisyromyia rutila* (Walker, 1849)
- Flagellum 2.3 x as long as scape + pedicel, 3.1 x as long as scape; abdominal median stripe thin; inner apex of gonocoxite narrow *Sisyromyia angustivitta* **sp. nov.**

Species of *Sisyromyia*

1. *Sisyromyia albisquama* **sp. nov.**

(Fig. 1)

Type specimens. **Holotype** ♂ Australia, SA, 7 ml. S. of Wigunda Tank, W. of Nullarbor H.S., 3 Aug 1952, Calaby & McIntosh.

Paratype ♂ Australia, SA, ♂ 28.26S 136.58E, Bando Hill, 20 Jun 1991, I. Gee.

Other specimen examined. Australia, WA, ♂ Perth, 20 Jun 1917, Clark.

Diagnosis. Medium-sized fly, body with mostly yellowish hairs. Wing membrane slightly infuscated and darker on anterior half. Anterior margin of scutellum with an indistinct band consisting of short white scales. Abdominal tergites 3–7 with white scales laterally.

Description. Male. Body length 8.0–8.7 mm, wing length 8.2–9.0 mm.

Head. Head about 2.2 x wider than long, mostly blackish with thick pale pruinescence and covered in admixed white to yellow scales and black hairs. Eyes dichoptic, narrowly separated by 0.9 x width of ocellus. Frons short, 1.5 x length of ocellar tubercle, upper narrow and black; lower half triangular, 3.2 x length of upper half, with thick pale pruinescence and covered in white scales. Ocellar tubercle slightly raised, blackish brown to black with grey pruinescence, with long black hairs admixed with few golden hairs. Face with thick pale pruinescence and long golden scales admixed with long black hairs, parafacial area with long white scales. Gena with thick pale pruinescence and long white scales. Clypeus with thick pale pruinescence and otherwise bare. Occiput with thick pale pruinescence, except dorsal area with sparse pruinescence, covered with black hairs admixed with some golden scales behind ocellar tubercle, and admixed with white hairs laterally. Posterior eye margin slightly convex. Antennal scape and pedicel black with thick pale pruinescence, scape with long black hairs, except long white scales laterally, pedicel with short black hairs; flagellum black without pruinescence, subapex with 3–5 long hairs. Scape 3.3 x as long as wide, and 2.6 x as long as pedicel, uniform from base to apex. Pedicel 1.5 x as long as wide. Flagellum 9.1 x as long as wide, 1.4 x as long as scape + pedicel, 2.0 x as long as scape, conical and slightly laterally compressed, one-segmented with apical stylus (Fig. 1c). Palpus long, just extending beyond oral cavity, dark yellow except brown on both ends with yellow hairs, one-segmented, without palpal pit. Mouthparts slender, 3.4 x as long as eye length, 2.3 x as long as head length, labellum thin and filiform (Fig. 1h).

Thorax. Integumental colour of scutum mostly black with thick brown pruinescence. Scutum covered with short golden hairs admixed with some black hairs, lateral stripe consisting of long white scales admixed with black hairs. Six brownish yellow notopleural setae present. Scutellum black with thick pale pruinescence, anterior half with an indistinct band consisting of short white scales, posterior half with long black hairs admixed with some golden scales. Pleura black with thick pale pruinescence, mostly covered in long pale yellow hairs, except dorsal half of anepisternum with brown hairs admixed with some black hairs, anepimeron, meron, laterotergite and mediotergite bare.

Legs. Legs mostly dark yellow, except femora brown but yellow apically. Femora covered in white to golden scales, ventral face admixed with long brown hairs. Mid femur with one anteroventral bristle on apical half, hind femur with one row of anteroventral bristles. Bristles and other hairs on legs brown. Fore tibia 2.1 x longer than fore basitarsus, mid tibia 2.4 x longer than mid basitarsus, hind tibia 2.4 x longer than hind basitarsus.

Wings. Wing membrane slightly infuscated and darker on anterior half. Cell r_5 open, M_1 close to R_5 ; cell br nearly as long as cell bm , crossvein $r-m$ arising from base of cell dm ; crossvein $m-m$ nearly as long as crossvein $r-m$; cell cup open. Stump vein present on anterior margin of R_4 (Fig. 1d). Haltere stem brown and knob dark yellow.

Abdomen. Integumental colour of tergites black with thick grey pruinescence. Tergite 1 with dense short yellow hairs, admixed with some long black hairs laterally; tergite 2 with golden hairs and scales, posterior half admixed with long black hairs and with few white scales laterally; tergites 3–7 with short golden scales admixed with long black hairs, and with short white scales laterally; tergites 2–7 with median stripe consisting of dense, decumbent short white scales. Sternites black except posterior margin yellow, with thick pale pruinescence, covered with white scales, except pale yellow scales laterally, admixed with some black hairs. **Genitalia.** Epandrium anterior margin slightly concave, posterior margin slightly convex (Fig. 1j). Lateral margin of gonocoxite nearly straight (Figs 1l,m); inner and outer apices of gonocoxite short and acute; gap between inner apices of gonocoxites long and wide; phallus shorter than gonocoxite (Fig. 1n).

Female. Unknown.

Remarks. *Sisyromyia albisquama* **sp. nov.** is similar to *Sisyromyia elongata* **sp. nov.**, but differs as follows: body hairs mostly yellowish; scutellum black; anterior margin of scutellum with a band consisting of short white scales; and abdominal tergites 3–7 with white scales laterally.

Etymology. The specific name refers to the white scales on lateral part of abdominal tergites 3–7.

Distribution. Australia (SA, WA).

FIGURE 1. *Sisyromyia albisquama* sp. nov. ♂ (a–i (external); j–n (genitalia)): (a) dorsal; (b) lateral; (c) antenna, lateral; (d) wing; (e) head, dorsal; (f) head, frontal; (g) head, profile; (h) head, lateral; (i) abdomen, dorsal; (j) epandrium, dorsal; (k) epandrium, lateral; (l) genital capsule, dorsal; (m) genital capsule, ventral; (n) genital capsule, lateral. Scale bars = 1 mm (a, b, d–h); = 0.1 mm (c, j–n).

2. *Sisyromyia angustivitta* sp. nov.

(Figs 2, 3)

Type specimens. **Holotype** ♂ Australia, WA, Albany, 5 Oct 1951 IFB Common. **Paratype** ♂ Australia, WA, same data as holotype.

Other specimen examined. Australia, **WA**, ♀ Stirling Rang Drive, Stirling Range Nat[ional] P[ar]k, 23 Sep 1981, ID Naumann & JC Cardale (WAM).

FIGURE 2. *Sisyromyia angustivitta* sp. nov. External (a–i (♂); j–o (♀)): (a, j) dorsal; (b, k) lateral; (c) antenna, lateral; (d) wing; (e, l) head, dorsal; (f, m) head, frontal; (g, n) head, profile; (h, o) head, lateral; (i) abdomen, dorsal. Scale bars = 1 mm (a, b, d–o); = 0.1 mm (c).

FIGURE 3. *Sisyromyia angustivitta* sp. nov. Genitalia (a–e (♂); f, g (♀)): (a) genitalic capsule, dorsal; (b) genitalic capsule, ventral; (c) genitalic capsule, lateral; (d) epandrium, dorsal; (e) epandrium, lateral; (f) sternite 8, ventral; (g) genitalia and spermathecae. Scale bars = 0.1 mm.

Diagnosis. Large-sized fly, body with mostly reddish hairs. Wing membrane brown. Abdominal tergites 2–7 with an inconspicuous narrow medial stripe consisting of sparse, decumbent short pale yellow scales.

Description. Male. Body length 11.9–12.0 mm, wing length 12.1–12.2 mm.

Head. Head about 2.3 x wider than long, mostly blackish with thick pale pruinescence and covered in admixed yellow to golden scales and brown to black hairs. Eyes holoptic. Frons short, 1.6 x length of ocellar tubercle, upper narrow and black; lower half triangular, as long as upper half, with sparse pale pruinescence and golden scales admixed with black hairs. Ocellar tubercle slightly raised, blackish brown to black with grey pruinescence, with black hairs admixed with few golden scales. Face with thick pale pruinescence and golden scales admixed with long black hairs, parafacial area without black hairs. Gena with thick pale pruinescence and long yellow scales. Clypeus with thick pale pruinescence and otherwise bare. Occiput with thick pale pruinescence and golden to reddish scales admixed with some black hairs. Posterior eye margin slightly convex. Antennal scape and pedicel black with sparse pale pruinescence, scape with long black hairs admixed with long golden scales, pedicel with short black hairs; flagellum black without pruinescence, subapex with 2–3 long hairs. Scape 2.4 x as long as wide, and 3.0 x as long as pedicel, uniform from base to apex. Pedicel as long as wide. Flagellum 12.0 x as long as wide, 2.3 x as long as scape + pedicel, 3.1 x as long as scape, conical and slightly laterally compressed, one-segmented with apical stylus, and with one long subapical hairs (Fig. 2c). Palpus long, just extending beyond oral cavity, yellow except apex brown, with pale yellow hairs except brown hairs apically, one-segmented, without palpal pit. Mouthparts slender, 3.9 x as long as eye length, 2.0 x as long as head length, labellum thin and filiform (Fig. 2h).

Thorax. Integumental colour of scutum mostly black with thick pale pruinescence. Scutum covered with short golden to reddish hairs admixed with few black hairs, some golden to reddish hairs turning brown apically. Scutellum brown with sparse pale pruinescence, with golden to reddish hairs admixed with few black hairs. Pleura black with thick pale pruinescence, mostly covered in long pale yellow hairs, except anepisternum with golden hairs admixed with few reddish hairs, anepimeron, meron, laterotergite and mediotergite bare.

Legs. Legs dark yellow. Femora with dense long yellow hairs and scales, admixed with few black hairs ventrally. Fore and mid femora with few anterior bristle on apical half; hind femur with one row of anteroventral bristles, and some separate bristles. Bristles and other hairs on legs brown. Fore tibia 2.4 x longer than fore basitarsus, mid tibia 2.7 x longer than mid basitarsus, hind tibia 2.7 x longer than hind basitarsus.

Wings. Wing membrane uniformly infuscated. Cell r_5 open, M_1 close to R_5 ; cell br nearly as long as cell bm , crossvein $r-m$ arising from base of cell dm ; crossvein $m-m$ nearly as long as crossvein $r-m$; cell cup open (Fig. 2d). Haltere stem and knob yellow.

Abdomen. Integumental colour of tergites black mostly with sparse pale pruinescence. Tergite 1 with thick pale pruinescence and dense golden to reddish hairs; tergites 2–7 with long golden to reddish hairs, hairs near posterior margin of tergites turning reddish on apical half; tergites 2–7 with thin median stripe consisting of sparse, decumbent short pale yellow scales. Sternites black except posterior margin yellow, with thick pale pruinescence, covered with yellow hairs. **Genitalia.** Epandrium anterior margin slightly concave, posterior margin slightly convex (Fig. 3d). Lateral margin of gonocoxite strongly curved (Figs 3a,b); lateral ejaculatory process narrow; inner apex of gonocoxite long and sharp, outer apex of gonocoxite long and rounded; gap between inner apices of gonocoxites medium; phallus shorter than gonocoxite (Fig. 3c).

Female. Body length 12.0 mm, wing length 12.1 mm. Very similar to male, except frons black with sparse pale pruinescence, 3.0 x as wide as ocellar tubercle, frons with short golden scales admixed with long black hairs (Fig. 2l). Abdominal tergites with reddish scales and hairs, admixed with black hairs; median stripe wider than male. Around 30 acanthophorite spines present on each side of tergite 9+10 (Fig. 3g).

Remarks. *Sisyromyia angustivitta* sp. nov. is similar to *Sisyromyia rutila*, but the stripe on abdominal tergites 2–7 is narrow and inconspicuous, and the outer apex of gonocoxite is long.

Distribution. Australia (WA).

Etymology. The specific name refers to the inconspicuous narrow medial stripe on the abdominal tergites.

3. *Sisyromyia aurata* (Walker, 1849)

(Figs 4–6)

Bombylius auratus Walker, 1849: 289. Type-locality: “Van Dieman’s Land” [= Australia (Tasmania)] & Australia (WA); 2 syntypes, BMNH.

Bombylius crassirostris Macquart, 1850: 421(115). Type-locality: “Nouvelle-Hollande, côte orientale” [probably = Australia (NSW)]; 3 syntypes, MNHN.

Bombylius lobalis Thomson, 1869: 487. Type-locality: Australia (NSW); holotype, NHRS.

Bombylius loewii Jaennicke, 1867: 346 [1868: 38]. Type-locality: “Australia”; holotype, SMFD.

Type specimens. Syntype of *Bombylius auratus* Walker, ♂ (2), (NHMUK 010921893) (Figs 4a,b). Syntype of *Bombylius crassirostris* Macquart, ♂ (3), (MNHN, ED9260) (Figs 4c,d).

Other specimen examined. Australia, NSW, ♂ National Park, 1 Jan 1926, Mackerras. ♀ National Park, 1 Mar 1926, Mackerras. ♂ Blackheath, 1 Feb 1926, Mackerras. ♂ (6) ♀ (5), Barrington Top, Feb 1925, SU ZooExp. ♀ Bulli, CF Deuquet. ♂ Megalong, FH Taylor. ♀ Austinmer, Dec 1928, HC Davis. ♂ Wentworth Falls, FH Taylor. ♀ 35.30S 150.24E, Bawley Point, 12 Feb 1997, DCF Rentz, K McCarron. ♀ Toronto, 24 Mar 1922, Health Dept. ♂ 35°32'51"S 150°20'54"E, Kioloa; creek crossing 2.5 km W, on Dangerboard Road; temperate rainforest, 3 Feb 2015, DJ Ferguson. ♀ (2), 35°51'24"S 150°10'46"E, Broulee Beach, dunes adjacent to island, 4 m, 26 Jan 2012, DJ Ferguson. ♂ Countegany, 31 Jan 1937, M Fuller. **Qld.**, ♀ Amiens, 14 Dec 1969, CF Ashby. ♂ Brisbane, H Hacker, 27 Nov 1911 (QM). ♀ Brisbane, H Hacker, 20 Aug 1918 (QM). ♀ Brisbane, H Hacker, 20 Nov 1917 (QM). ♀ Brisbane, TC Marshall (QM). ♀ SE Qld., Emu Creek, 31 Dec 1964, C Speed (QM). **SA**, ♂ (1) ♀ (1), Flinders Chase, Kangaroo Is., Jan-Feb 1940, DCS. ♀ Cotter R[iver], 14 Mar 1964, J Bancroft. **Tas.**, ♂ Corinna, Pieman R[iver], 28 Dec 1953, TG Campbell. ♂ Freycinet Nat[ional] P[ar]k, 28 Feb 1963, IFB Common & MS Upton. ♀ 42.51°S 145.49°E, S.W. Tasmania, Transect 7L 900, 11 Feb 1976, D Coleman et al. ♀ 42.50S 146.04E, Pelion Hut, 900 m, 7-8 Jan 1989, PB McQuillan & ES Nielsen. ♀ Franklin River, 10 Feb 1967, EF Riek. ♀ 42°43'S 145°48'E, SW Tasmania, 16 Feb 1978, L Hill. ♀ Rosebery, 8 Feb 1925 (QM). ♀ Rosebery, 9 Feb 1925 (QM). ♀ Barrington area, Gummi Plain, 3800 ft, 2 Mar 1935, BM Millan (QM). **Vic.**, ♀ Mt Macedon, HW Davey. ♀ (2), 37°27'S 148°35'E, East Gippsland, Martin's Creek, 9 April 1999, K Theile & D Yeates. ♀ Bright, HW Davey. ♂ Bullock Creek, NE Nat[ional] P[ar]k Rd, 11 Feb 1968, CW Frazier. **WA**, ♂ (3) ♀ (3), Waroona, 13–19 Mar 1909, GF Berthoud. ♀ Augusta, 3 Oct 1970, DH Colless. ♀ Newman.

FIGURE 4. *Sisyromyia aurata* (Walker, 1849). Types: (a, b) Syntype of *Bombylius auratus* Walker, 1849 (NHMUK 010921893); (c, d) Holotype of *Bombylius rutilus* Walker, 1849 (NHMUK 010921896); (e, f) Syntype of *Bombylius crassirostris* Macquart, 1850 (MNHN, ED9260), photograph from digitized type collection of Muséum national d'Histoire naturelle: <https://science.mnhn.fr/institution/mnhn/collection/ed/item/ed9260?listIndex=1&listCount=163>. (a, c, e) dorsal; (b, d, f) lateral. Scale bars = 1 mm.

Diagnosis. Large-sized fly, body with mostly bright golden hairs. Wing membrane slightly infuscated.

Redescription. Male. Body length 8.4–12.9 mm, wing length 10.7–15.0 mm.

FIGURE 5. *Sisyromyia aurata* (Walker, 1849). External (a–i (♂); j–o (♀)): (a, j) dorsal; (b, k) lateral; (c) antenna, lateral; (d) wing; (e, l) head, dorsal; (f, m) head, frontal; (g, n) head, profile; (h, o) head, lateral; (i) abdomen, dorsal. Scale bars = 1 mm (a, b, d–o); = 0.1 mm (c).

Head. Head about 2.4 x wider than long, mostly blackish with thick pale pruinescence and covered in admixed pale yellow to black hairs and scales. Eyes holoptic. Frons short, 2.1 x length of ocellar tubercle, upper narrow and black; lower half triangular, 0.9 x length of upper half, with sparse pale pruinescence and golden scales admixed with few black hairs. Ocellar tubercle slightly raised, blackish brown to black with grey pruinescence, with long black hairs admixed with few golden scales. Face with thick pale pruinescence and golden scales admixed with some long black hairs. Gena with thick pale pruinescence and long pale yellow hairs. Clypeus with sparse pale

FIGURE 6. *Sisyromyia aurata* (Walker, 1849). Genitalia (a–e ♂; f, g ♀): (a) genitalic capsule, dorsal; (b) genitalic capsule, ventral; (c) genitalic capsule, lateral; (d) epandrium, dorsal; (e) epandrium, lateral; (f) sternite 8, ventral; (g) genitalia and spermathecae. Scale bars = 0.1 mm.

pruinescence and otherwise bare. Occiput with thick pale pruinescence and dense golden scales. Posterior eye margin slightly convex. Antennal scape and pedicel black with thick pale pruinescence, scape with long black hairs admixed with few golden hairs and scales ventrally, pedicel with short black hairs dorsally and short golden hairs ventrally; flagellum black without pruinescence, subapex with 3–5 long hairs. Scape 2.5 x as long as wide, and 2.5 x as long as pedicel, uniform from base to apex. Pedicel as long as wide. Flagellum 10.0 x as long as wide, 2.3 x as long as scape + pedicel, 3.2 x as long as scape, conical and slightly laterally compressed, one-segmented with apical stylus (Fig. 5c). Palpus long, just extending beyond oral cavity, black with pale yellow hairs, one-segmented, without palpal pit. Mouthparts slender, 2.8 x as long as eye length, 1.5 x as long as head length, labellum large and fleshy (Fig. 5h).

Thorax. Integumental colour of scutum mostly black with sparse pale pruinescence except postalar callus brown. Scutum covered with short golden scales and hairs, admixed with some short black hairs. Five brownish yellow notopleural setae present. Scutellum brownish yellow with sparse pale pruinescence, with short golden scales and long golden hairs, admixed with some long black hairs, black hairs denser posteriorly. Pleura black with thick pale pruinescence, mostly covered in long pale yellow hairs, except anepimeron, meron, laterotergite and mediotergite bare.

Legs. Legs mostly yellow, tibiae turning dark yellow apically, tarsi brownish yellow. Fore and mid femora with golden scales, ventral half of femora with pale yellow hairs. Mid femur with 3–4 anterior bristles on apical half; hind femur with one row of anteroventral bristles and more separate bristles on apical half. Bristles and other hairs on legs brown. Fore tibia 1.7 x longer than fore basitarsus, mid tibia 2.2 x longer than mid basitarsus, hind tibia 2.1 x longer than hind basitarsus.

Wings. Wing membrane slightly infuscated, darker towards wing base. Cell r_5 open, M_1 close to R_5 ; cell br nearly as long as cell bm , crossvein $r-m$ arising from base of cell dm ; crossvein $m-m$ nearly as long as crossvein $r-m$; cell cup open (Fig. 5d). Haltere stem and knob dark yellow.

Abdomen. Integumental colour of tergites black mostly with sparse pale pruinescence. Tergite 1 with thick pale pruinescence and dense golden hairs; tergite 2 with long golden hairs on anterior half and laterally, and with long black hairs on posterior half; tergites 3–7 with sparse long black hairs in the middle and dense long golden hairs laterally; tergites 2–4 with indistinct lateral stripe consisting of sparse, decumbent golden scales; tergites 2–7 with median stripe consisting of dense, decumbent short golden scales. Sternites black except posterior margin yellow, with thick pale pruinescence, covered with golden hairs. **Genitalia.** Epandrium anterior and posterior margins straight (Fig. 6d). Lateral margin of gonocoxite strongly curved (Figs 6a,b); lateral ejaculatory process wide; inner and outer apices of gonocoxite long and sharp; gap between inner apices of gonocoxites narrow; phallus shorter than gonocoxite (Fig. 6c).

Female. Body length 9.1–14.0 mm, wing length 11.8–16.1 mm. Very similar to male, except frons black with thick pale pruinescence, 3.2 x as wide as ocellar tubercle, frons with short golden scales admixed with long black hairs (Fig. 5l). Around 30 acanthophorite spines present on each side of tergite 9+10 (Fig. 6g).

Remarks. We examined the holotype of *Bombylius rutilus*, which was proposed as a synonym of *Sisyromyia aurata* (Roberts, 1928), however we consider it is a separate species (see ‘8. *Sisyromyia rutila* (Walker, 1849)’ later).

Distribution. Australia (NSW, Qld., SA, Tas., Vic., WA).

4. *Sisyromyia decorata* (Walker, 1849)

(Figs 7–9)

Bombylius decoratus Walker, 1849: 291. Type-locality: Australia (WA); 2 syntypes, BMNH.

Type specimen. Syntype of *Bombylius decoratus* Walker, ♂ Western Australia (NHMUK 010921894) (Fig. 7).

Other specimen examined. Australia, WA, ♂ -31.9648 116.5125, York, open woodland, 10 Aug 2018, J & F Hort. ♂ (2) ♀ (4) -31.9648 116.5125, York, open woodland, 11 Aug 2018, J & F Hort. ♂ (2) ♀ (1) -31.9648 116.5125, York, open woodland, 12 Aug 2018, J & F Hort. ♂ -31.9648 116.5125, York, open woodland, 24 Aug 2018, J & F Hort. ♀ 34°46’36.3”S 116°18’56.4”E, D’Entrecasteaux NP, Deeside Coast Road, malaise, 81 m, C Lambkin, J Recsei, J Hamilton, 5–14 Nov 2003, ANIC Buck Sample 2201.

Diagnosis. Medium-sized fly, body with mostly brownish hairs. Wing membrane dark brown on anterior half and clear on posterior half. Male eyes dichoptic, narrowly separated by 0.3 x width of ocellus. Gap between inner apices of gonocoxites wide. Inner apex of gonocoxite long.

Redescription. Male. Body length 7.4–10.5 mm, wing length 7.0–8.4 mm.

FIGURE 7. *Sisyromyia decorata* (Walker, 1849). Syntype of *Bombylius decoratus* Walker, 1849, NHMUK 010921894: (a) dorsal; (b) lateral. Scale bars = 1 mm.

Head. Head about 2.4 x wider than long, mostly blackish with thick pale pruinescence and covered in admixed white to black hairs and scales. Eyes dichoptic, narrowly separated by 0.3 x width of ocellus. Frons short, 1.9 x length of ocellar tubercle, upper narrow and black; lower half triangular, 0.6 x length of upper half, with thick pale pruinescence and black hairs admixed with few pale scales. Ocellar tubercle slightly raised, blackish brown to black with thick grey pruinescence, with long black hairs and some golden scales. Face with thick pale pruinescence and golden scales admixed with long black hairs; parafacial area with long white scales. Gena with thick pale pruinescence and dense long white to yellow hairs, admixed with few brown hairs. Clypeus with thick pale pruinescence and otherwise bare. Occiput with thick pale pruinescence and yellow scales and black hairs. Posterior eye margin slightly convex. Antennal scape and pedicel brown with thick pale pruinescence, scape with long black hairs admixed with few white scales ventrally, pedicel with short black hairs; flagellum black without pruinescence, subapex with 3–5 long hairs. Scape 3.1 x as long as wide, and 3.2 x as long as pedicel, uniform from base to apex. Pedicel 1.1 x as long as wide. Flagellum 12.0 x as long as wide, 1.7 x as long as scape + pedicel, 2.3 x as long as scape, conical and slightly laterally compressed, one-segmented with apical stylus (Fig. 8c). Palpus long, just extending beyond oral cavity, dark yellow with black hairs, one-segmented, without palpal pit. Mouthparts slender, 4.5 x as long as eye length, 3.3 x as long as head length, labellum thin and filiform (Fig. 8h).

Thorax. Integumental colour of scutum mostly black with thick brown pruinescence except two median wide white pruinescent stripes, postalar callus brown with sparse pale pruinescence. Scutum covered with short pale yellow to brown hairs, admixed with few short black hairs, lateral stripe consisting of short white to pale yellow scales, and posteriorly with few short white and golden scales. Seven brownish yellow notopleural setae present. Scutellum black with sparse pale pruinescence, anterior margin with an indistinct band consisting of short white scales, posterior margin with long brown hairs admixed with some long black hairs. Pleura black with thick pale pruinescence, mostly covered in long white to pale yellow hairs admixed with few black hairs, except dorsal half of anepisternum with brown hairs, anepimeron, meron, laterotergite and mediotergite bare.

Legs. Legs mostly yellow, except femora black. Femora with long black hairs admixed with some brown scales. Mid femur with two anterior bristle on apical half; hind femur with one row of anteroventral bristles and one row of posteroventral bristles, more separate bristles on apical half. Bristles and other hairs on legs brown. Fore tibia 2.0 x longer than fore basitarsus, mid tibia 2.6 x longer than mid basitarsus, hind tibia 2.4 x longer than hind basitarsus.

Wings. Wing membrane dark brown on anterior half and clear on posterior half, darker towards wing base. Cell r_5 open, M_1 close to R_5 ; cell br nearly as long as cell bm , crossvein $r-m$ arising from base of cell dm ; crossvein $m-m$ nearly as long as crossvein $r-m$; cell cup open (Fig. 8d). Haltere stem brown, and knob yellow.

Abdomen. Integumental colour of tergites black mostly with sparse pale pruinescence. Tergite 1 with thick pale pruinescence and dense brown hairs; tergites 2 with brown hairs, posterior half admixed with some black hairs, hairs denser laterally; tergites 3–7 with short golden scales and sparse long black hairs in dorsal face, and pale yellow to white scales laterally, best viewed from posterodorsal side, laterally with dense long brown hairs admixed with black hairs; tergites 2–7 with median stripe consisting of dense, decumbent short white scales.

FIGURE 8. *Sisyromyia decorata* (Walker, 1849). External (a–i (♂); j–o (♀)): (a, j) dorsal; (b, k) lateral; (c) antenna, lateral; (d) wing; (e, l) head, dorsal; (f, m) head, frontal; (g, n) head, profile; (h, o) head, lateral; (i) abdomen, dorsal. Scale bars = 1 mm (a, b, d–o); = 0.1 mm (c).

FIGURE 9. *Sisyromyia decorata* (Walker, 1849). Genitalia (a–e (♂); f, g (♀)): (a) genitalic capsule, dorsal; (b) genitalic capsule, ventral; (c) genitalic capsule, lateral; (d) epandrium, dorsal; (e) epandrium, lateral; (f) sternite 8, ventral; (g) genitalia and spermathecae. Scale bars = 0.1 mm.

Sternites black except posterior margin yellow, with thick pale pruinescence, covered with pale brown hairs and scales, admixed with few black hairs. *Genitalia*. Epandrium anterior margin strongly concave, posterior margin straight (Fig. 9d). Lateral margin of gonocoxite nearly straight (Figs 9a,b); lateral ejaculatory process wide; inner apex of gonocoxite long and acute, outer apex of gonocoxite long and sharp; gap between inner apices of gonocoxites wide; phallus shorter than gonocoxite (Fig. 9c).

Female. Body length 5.7–7.7 mm, wing length 6.9–9.1 mm. Very similar to male, except frons black with thick pale pruinescence, 4.0 x as wide as ocellar tubercle, frons with long black hairs admixed with few short white and golden scales (Fig. 8l). Body hairs paler than male. Around 30 acanthophorite spines present on each side of tergite 9+10 (Fig. 9g).

Remarks. *Bombylius decoratus* was first described based on two specimens from WA. Twenty years later, the species *Bombylius scutellaris* was described from NSW. As *Bombylius scutellaris* is very similar to *Bombylius decoratus* externally, it was considered a synonym of the latter by Roberts (1928: 429). However, this arrangement was not recognised in the catalog (Evenhuis & Greathead, 1999). We compared the specimens from NSW and WA, and agree with Evenhuis & Greathead's decision to keep two valid species (also see '9. *Sisyromyia thomsoni* Evenhuis & Greathead, 1999' later).

Sisyromyia decorata is similar to *Sisyromyia thomsoni*, but differs as follows: male eyes dichoptic; gap between inner apex of gonocoxite wide; inner apex of gonocoxite long.

Distribution. Australia (WA).

5. *Sisyromyia elongata* sp. nov.

(Figs 10, 11)

Type specimens. **Holotype** ♂ Australia, WA, S31°35' E115°48', Cypress R[oa]d, Pinjar, 31 May 1981, MJ Smart.

Paratypes ♂ (3), Australia, WA, same data as holotype.

Other specimen examined. Australia, WA, ♂ (1) ♀ (1), S31°49' E115°57', Henley Brook, 16 May 1981, MJ Smart. ♀ S31°38' E115°51', Dasypogon R[oa]d, Pinjar, 16 May 1981, MJ Smart.

Diagnosis. Medium-sized fly, body with mostly brownish hairs. Wing membrane slightly infuscated and darker on anterior half. Scutellum brownish yellow. Integumental colour of abdominal tergites black except posterolaterally brown. Outer apex of gonocoxite long.

Description. Male. Body length 9.6–10.8 mm, wing length 9.1–10.1 mm.

Head. Head about 2.2 x wider than long, mostly blackish with thick pale pruinescence and covered in admixed white to golden scales and black hairs. Eyes dichoptic, narrowly separated width of ocellus. Frons short, 1.5 x length of ocellar tubercle, upper narrow and black; lower half triangular, 2.0 x length of upper half, with thick pale pruinescence and black hairs admixed with golden scales. Ocellar tubercle slightly raised, blackish brown to black with grey pruinescence, with long black hairs. Face with thick pale pruinescence and long black hairs admixed with some golden to white scales, parafacial area with more white scales. Gena with thick pale pruinescence and long white scales. Clypeus with thick pale pruinescence and otherwise bare. Occiput with thick pale pruinescence, except dorsal area with sparse pruinescence, with black hairs admixed with some golden scales behind ocellar tubercle. Posterior eye margin slightly convex. Antennal scape and pedicel black with thick pale pruinescence, scape with long black hairs, pedicel with short black hairs; flagellum black without pruinescence, subapex with 3–5 long hairs. Scape 3.2 x as long as wide, and 2.7 x as long as pedicel, uniform from base to apex. Pedicel 1.3 x as long as wide. Flagellum 12.0 x as long as wide, 1.8 x as long as scape + pedicel, 2.6 x as long as scape, conical and slightly laterally compressed, one-segmented with apical stylus (Fig. 10c). Palpus long, just extending beyond oral cavity, brown with yellow hairs, one-segmented, without palpal pit. Mouthparts slender, 4.5 x as long as eye length, 2.9 x as long as head length, labellum thin and filiform (Fig. 10h).

Thorax. Integumental colour of scutum mostly black with sparse pale pruinescence except postalar callus brown, dorsocentral brown pruinescence stripe present. Scutum covered with short brown hairs admixed with few short black hairs, lateral with some white scales; hairs denser on anterior half. Four brown notopleural setae present. Scutellum brownish yellow with sparse pale pruinescence, with short brown hairs admixed with some short black hairs, and with white hairs laterally, black hairs denser and longer posteriorly. Pleura black with thick pale pruinescence, mostly covered in long pale yellow hairs, except dorsal half of anepisternum with brown hairs

admixed with some black hairs, anepimeron, meron, laterotergite and mediotergite bare.

Legs. Legs brown. Femora cover in white to yellow scales, and with long black hairs admixed with some white hairs. Fore femur with two anteroventral bristles on apical half; mid and hind femora with one row of anteroventral bristles and some separate bristles on apical half. Bristles and other hairs on legs brown. Fore tibia 1.7 x longer than fore basitarsus, mid tibia 2.0 x longer than mid basitarsus, hind tibia 2.0 x longer than hind basitarsus.

FIGURE 10. *Sisyromyia elongata* sp. nov. External (a–i (♂); j–o (♀)): (a, j) dorsal; (b, k) lateral; (c) antenna, lateral; (d) wing; (e, l) head, dorsal; (f, m) head, frontal; (g, n) head, profile; (h, o) head, lateral; (i) abdomen, dorsal. Scale bars = 1 mm (a, b, d–o); = 0.1 mm (c).

FIGURE 11. *Sisyromyia elongata* sp. nov. Genitalia (a–e (♂); f, g (♀)): (a) genitalic capsule, dorsal; (b) genitalic capsule, ventral; (c) genitalic capsule, lateral; (d) epandrium, dorsal; (e) epandrium, lateral; (f) sternite 8, ventral; (g) genitalia and spermathecae. Scale bars = 0.1 mm.

Wings. Wing membrane infuscated on anterior margin, with darker towards wing base. Cell r_5 open, M_1 close to R_5 ; cell br nearly as long as cell bm , crossvein $r-m$ arising from base of cell dm ; crossvein $m-m$ nearly as long as crossvein $r-m$; cell cup open (Fig. 10d). Haltere stem and knob dark yellow.

Abdomen. Integumental colour of tergites black except posterolaterally brown, mostly with sparse pale pruinescence, but tergites 1–2 with thick pale pruinescence. Tergite 1 with dense white to pale yellow hairs, admixed with some black hairs laterally; tergite 2 with long pale yellow hairs on anterior half, and with long brown hairs admixed with long black hairs on posterior half and laterally; tergites 3–7 with long brown hairs and long black hairs, admixed with few golden scales; tergites 4–7 with median stripe consisting of dense, decumbent short white scales. Sternites black except posterior half yellow, with sparse pale pruinescence, covered with golden scales admixed with black hairs. **Genitalia.** Epandrium anterior and posterior margins slightly concave (Fig. 11d). Lateral margin of gonocoxite nearly straight (Figs 11a,b); lateral ejaculatory process wide; inner apex of gonocoxite short and rounded, outer apex of gonocoxite elongate and narrow; gap between inner apices of gonocoxites medium; phallus nearly as long as gonocoxite (Fig. 11c).

Female. Body length 7.7–10.0 mm, wing length 10.0–12.8 mm. Very similar to male, except frons black with thick pale pruinescence, 3.0 x as wide as ocellar tubercle, frons with golden scales admixed with long blackish brown hairs (Fig. 10l). Around 30 acanthophorite spines present on each side of tergite 9+10 (Fig. 11g).

Remarks. *Sisyromyia elongata* **sp. nov.** is similar to *Sisyromyia albisquama* **sp. nov.**, but differs in having the body hairs mostly brownish; scutellum brownish yellow; anterior margin of scutellum without a white band; abdominal tergites 3–7 without white scales laterally; and outer apex of gonocoxite long.

Etymology. The specific name refers to the outer apex of gonocoxite elongate.

Distribution. Australia (WA).

6. *Sisyromyia limbata* (Bigot, 1892)

(Figs 12–14)

Sparnopolius limbatus Bigot, 1892: 369. Type-locality: “Australie”; holotype, BMNH.

Type specimen. Holotype of *Sparnopolius limbatus* Bigot, ♂ (NHMUK 010921895) (Fig. 12).

Other specimen examined. Australia, SA, ♂ Adelaide, 1949. WA, ♂ (13) ♀ (6), Mt. Singleton, 20 Jul 1983, W Williamson. ♂ (1) ♀ (1), Eradu, 8 Sep 1926, EW Ferguson. ♂ 2 mi. E. of Ghooli, 29 Sep 1956, JH Calaby.

Diagnosis. Medium-sized fly, body with mostly brownish hairs. Wing membrane darker on anterior half and spotted. Anterior margin of scutellum with a band consisting of short white scales. Male eyes holoptic; frons long, 2.8 x length of ocellar tubercle. Gap between inner apices of gonocoxites wide. Outer margin of gonocoxite nearly straight.

Redescription. Male. Body length 6.9–8.3 mm, wing length 8.0–9.8 mm.

FIGURE 12. *Sisyromyia limbata* (Bigot, 1892). Holotype of *Sparnopolius limbatus* Bigot, 1892 (NHMUK 010921895): (a) dorsal; (b) lateral. Scale bars = 1 mm.

FIGURE 13. *Sisyromyia limbata* (Bigot, 1892). External (a–i (♂); j–o (♀)): (a, j) dorsal; (b, k) lateral; (c) antenna, lateral; (d) wing; (e, l) head, dorsal; (f, m) head, frontal; (g, n) head, profile; (h, o) head, lateral; (i) abdomen, dorsal. Scale bars = 1 mm (a, b, d–o); = 0.1 mm (c).

Head. Head about 2.1 x wider than long, mostly blackish with thick pale pruinescence and covered in admixed white to pale yellow scales and black hairs. Eyes holoptic. Frons long, 2.8 x length of ocellar tubercle, upper narrow and black; lower half triangular, 0.8 x length of upper half with sparse pale pruinescence and white scales admixed with black hairs. Ocellar tubercle slightly raised, blackish brown to black with grey pruinescence, with long black

FIGURE 14. *Sisyromyia limbata* (Bigot, 1892). Genitalia (a–e (♂); f, g (♀)): (a) genitalic capsule, dorsal; (b) genitalic capsule, ventral; (c) genitalic capsule, lateral; (d) epandrium, dorsal; (e) epandrium, lateral; (f) sternite 8, ventral; (g) genitalia and spermathecae. Scale bars = 0.1 mm.

hairs admixed with few pale yellow scales. Face with thick pale pruinescence and long black hairs admixed with some pale yellow scales, parafacial area with white scales. Gena with thick pale pruinescence and long white scales. Clypeus with thick pale pruinescence and otherwise bare. Occiput with thick pale pruinescence and dense white to pale yellow scales, admixed with black hairs near dorsal eye margin. Posterior eye margin slightly convex. Antennal scape and pedicel black with thick pale pruinescence, scape with long black hairs admixed with some white scales laterally, pedicel with short black hairs and admixed with few white hairs ventrally; flagellum black without pruinescence, subapex with 3–5 long hairs. Scape 2.9 x as long as wide, and 2.6 x as long as pedicel, uniform from base to apex. Pedicel 1.1 x as long as wide. Flagellum 8.4 x as long as wide, 1.9 x as long as scape + pedicel, 2.7 x as long as scape, conical and slightly laterally compressed, one-segmented with apical stylus (Fig. 13c). Palpus long, just extending beyond oral cavity, brown with white hairs, one-segmented, without palpal pit. Mouthparts slender, 3.7 x as long as eye length, 2.4 x as long as head length, labellum thin and filiform (Fig. 13h).

Thorax. Integumental colour of scutum mostly black with thick pale pruinescence, brown pruinescence present on transverse suture, dorsocentral, and lateral margin. Scutum covered with short pale yellow hairs admixed with short black hairs and few golden scales, hairs denser anteriorly, lateral stripe consisting of long white scales. Four brownish yellow notopleural setae present. Scutellum black with sparse pale pruinescence, anterior half with a band consisting of short white scales, posterior half with long black hairs admixed with some golden hairs, black hairs denser on posterior margin. Pleura black with thick pale pruinescence, mostly covered in long pale yellow hairs, except dorsal half of anepisternum with brown hairs admixed with few black hairs, anepimeron, meron, laterotergite and mediotergite bare.

Legs. Legs mostly dark yellow except femora brown. Femora covered in golden scales, ventral face with long brown hairs. Hind femur with one row of anteroventral bristles. Bristles and other hairs on legs brown. Fore tibia 2.2 x longer than fore basitarsus, mid tibia 2.7 x longer than mid basitarsus, hind tibia 2.4 x longer than hind basitarsus.

Wings. Wing membrane slightly infuscated, with inconspicuous light markings on the area around base of vein R_4 , crossvein $m-m$, crossvein $dm-cu$ and apex of cell bm and cell br . Cell r_5 open, M_1 close to R_5 ; cell br nearly as long as cell bm , crossvein $r-m$ arising from base of cell dm ; crossvein $m-m$ nearly as long as crossvein $r-m$; cell cup open (Fig. 13d). Haltere stem and knob pale yellow.

Abdomen. Integumental colour of tergites black mostly with sparse brown pruinescence. Tergite 1 with dense yellow hairs, admixed few long black hairs laterally; tergite 2 with long golden hairs on anterior half and laterally, and with long black hairs admixed with short golden scales on posterior half; tergites 3–7 with sparse long black hairs admixed with short golden scales, laterally with long white to pale yellow long scales; tergites 2–7 with median stripe consisting of dense, decumbent short white scales. Sternites black except posterior margin yellow, with thick pale pruinescence, covered with white to pale yellow hairs, admixed with few brown hairs. **Genitalia.** Epandrium anterior margin slightly concave, posterior margin slightly convex (Fig. 14d). Lateral margin of gonocoxite nearly straight (Figs 14a,b); lateral ejaculatory process wide; inner apex of gonocoxite short and acute, outer apex of gonocoxite long and sharp; gap between inner apices of gonocoxites wide; phallus shorter than gonocoxite (Fig. 14c).

Female. Body length 7.4–8.2 mm, wing length 8.6–10.0 mm. Very similar to male, except frons black with thick pale pruinescence, 3.4 x as wide as ocellar tubercle, frons with long black hairs admixed with some short golden scales (Fig. 13l). Around 20 acanthophorite spines present on each side of tergite 9+10 (Fig. 14g).

Distribution. Australia (SA, WA).

7. *Sisyromyia maculipennis* sp. nov.

(Figs 15, 16)

Type specimens. **Holotype** ♂ Australia, WA, Albany, S32°22' E116°14', Mt. Vincent, 30 Aug 1981, MJ Smart.

Paratype ♂ Australia, WA, same data as holotype.

Other specimen examined. Australia, WA, ♀ -31.0052° 199.212° GE, Bullfinch, off Perilya-Turkey Hill R[oa]d, 29 Sep 2017, JA & JG Lumbers. ♀ -31.9823 116.5095, on *Leucopogon*, 8 Aug 2018, J & F Hort. ♂ -31.9648 116.5125, open woodland, 11 Aug 2018, J & F Hort. ♂ (8) ♀ (1), -32.0527 116.5557, *Leucopogon* sp., 12 Aug 2018, J & F Hort. ♂ (3) ♀ (1), -31.9784 116.5953, Wandoo woodland, 28 Jul 2018, J & F Hort. ♀ (2), -31.9822 116.5879, open woodland, 31 Jul 2018, J & F Hort.

Diagnosis. Medium-sized fly, body with mostly brownish hairs. Wing membrane darker on anterior half and spotted. Anterior margin of scutellum with a band consisting of short white scales. Male eyes dichoptic; frons short, 1.8 x length of ocellar tubercle. Gap between inner apices of gonocoxites narrow. Lateral margin of gonocoxite strongly curved.

Description. Male. Body length 9.1–9.3 mm, wing length 9.6–9.8 mm.

Head. Head about 2.4 x wider than long, mostly blackish with thick pale pruinescence and covered in admixed white to black hairs and scales. Eyes dichoptic, narrowly separated by 0.2 x width of ocellus. Frons short, 1.8 x length of ocellar tubercle, upper narrow and black; lower half triangular, 1.3 x length of upper half, with sparse pale pruinescence and white scales admixed with black hairs. Ocellar tubercle slightly raised, blackish brown to black with grey pruinescence, with long black hairs admixed with some golden hairs. Face with thick pale pruinescence and long golden hairs admixed with long black hairs, parafacial area with long white hairs. Gena with thick pale pruinescence and long white scales. Clypeus with thick pale pruinescence and otherwise bare. Occiput with thick pale pruinescence and with black hairs. Posterior eye margin slightly convex. Antennal scape and pedicel black with thick pale pruinescence, scape with long black hairs admixed with some golden scales laterally, pedicel with long black hairs; flagellum black without pruinescence, subapex with 3–5 long hairs. Scape 3.0 x as long as wide, and 2.5 x as long as pedicel, uniform from base to apex. Pedicel 1.2 x as long as wide. Flagellum 10.9 x as long as wide, 1.9 x as long as scape + pedicel, 2.7 x as long as scape, conical and slightly laterally compressed, one-segmented with apical stylus (Fig. 15c). Palpus long, just extending beyond oral cavity, yellow except brown apically with brown hairs, one-segmented, without palpal pit. Mouthparts slender, 2.9 x as long as eye length, 1.7 x as long as head length, labellum thin and filiform (Fig. 15h).

Thorax. Integumental colour of scutum mostly black with thick grey pruinescence, except postalar callus brown, dorsocentral brown pruinescence present. Scutum covered with short brown hairs admixed with few black hairs, hairs denser anteriorly, indistinct lateral stripe consisting of long white scales. Two brownish yellow notopleural setae present. Scutellum black with sparse pale pruinescence, and thick brown pruinescence on posterior margin, anterior half with a band consisting of short white scales, posterior half with long black hairs admixed with some brown hairs, hairs denser on posterior margin. Pleura black with thick pale pruinescence, mostly covered in long white hairs, except dorsal half of anepisternum with brown hairs, anepimeron, meron, laterotergite and mediotergite bare.

Legs. Legs mostly brown. Femora covered in white scales, ventral face admixed with long brown hairs. Mid and hind femora with two anteroventral bristles on apical half. Bristles and other hairs on legs brown. Fore tibia 2.2 x longer than fore basitarsus, mid tibia 2.4 x longer than mid basitarsus, hind tibia 2.1 x longer than hind basitarsus.

Wings. Wing membrane slightly infuscated and darker on anterior half, with markings on the area around base of vein R_4 , crossvein $m-m$, crossvein $dm-cu$ and apex of cell bm and cell br . Cell r_5 open, M_1 close to R_5 ; cell br nearly as long as cell bm , crossvein $r-m$ arising from base of cell dm ; crossvein $m-m$ nearly as long as crossvein $r-m$; cell cup open; stump vein present on anterior margin of R_4 (Fig. 15d). Haltere stem brown and knob dark yellow.

Abdomen. Integumental colour of tergites black with thick grey pruinescence. Tergite 1 with dense yellow hairs; tergites 2–7 with long brown scales admixed with long black hairs, and with median stripe consisting of dense, decumbent short white scales. Sternites black except posterior margin yellow, with thick pale pruinescence, covered with long white hairs admixed with few black hairs. **Genitalia.** Epandrium anterior margin slightly concave, posterior margin straight (Fig. 16d). Lateral margin of gonocoxite strongly curved (Figs 16a,b); lateral ejaculatory process wide; inner apices of gonocoxite short and rounded, outer apex of gonocoxite long and rounded; gap between inner apex narrow; phallus shorter than gonocoxite (Fig. 16c).

Female. Body length 9.2 mm, wing length 10.2 mm. Very similar to male, except frons black with thick pale pruinescence, 2.4 x as wide as ocellar tubercle, frons with short golden scales admixed with long black hairs (Fig. 15l). Around 20 acanthophorite spines present on each side of tergite 9+10 (Fig. 16g).

Remarks. *Sisyromyia maculipennis* sp. nov. is similar to *Sisyromyia limbata*, but the male eyes are dichoptic; the frons is short, 1.8 x length of ocellar tubercle; the gap between inner apices of gonocoxites is narrow; and the lateral margin of gonocoxite is strongly curved.

Etymology. The specific name refers to the spotted wing.

Distribution. Australia (WA).

FIGURE 15. *Sisyromyia maculipennis* sp. nov. External (a–i (♂); j–o (♀)): (a, j) dorsal; (b, k) lateral; (c) antenna, lateral; (d) wing; (e, l) head, dorsal; (f, m) head, frontal; (g, n) head, profile; (h, o) head, lateral; (i) abdomen, dorsal. Scale bars = 1 mm (a, b, d–o); = 0.1 mm (c).

FIGURE 16. *Sisyromyia maculipennis* sp. nov. Genitalia (a–e (♂); f, g (♀)): (a) genitalic capsule, dorsal; (b) genitalic capsule, ventral; (c) genitalic capsule, lateral; (d) epandrium, dorsal; (e) epandrium, lateral; (f) sternite 8, ventral; (g) genitalia and spermathecae. Scale bars = 0.1 mm.

8. *Sisyromyia rutila* (Walker, 1849)

(Figs 17–19)

Bombylius rutilus Walker, 1849: 289. Type-locality: Australia (NSW); holotype, BMNH.

Bombylius albavittus Macquart, 1850: 421(117). Type-locality: “Nouvelle-Hollande, côte orientale” [= eastern Australia]; holotype, MNHN. **New synonym.**

albovitta, *albovittata*, errors for *albavitta*.

Type specimens. Holotype of *Bombylius rutilus* Walker, ♂ (NHMUK 010921896) (Figs 17ab). Holotype of *Bombylius albavittus* Macquart, ♂ (MNHN ED9263) (Figs 17cd).

Other specimen examined. Australia, **ACT**, ♀ (2), Bendora, 2 Mar 1949, Paramonov. ♀ (2), Mt. Gingera, 28 Mar 1951, Common & Day. ♀ (2), Mt. Franklin, 13 Apr 1949, DF Waterhouse. ♀ Brindabella Range, 1400 m, 13 Apr 1979, MG Jefferies. ♂ Lees Spring, 26 Feb 1938, TG Campbell. **NSW**, ♀ 3 ml SE Pilot Hill, Bago Forest, Batlow, 2 Mar 1957, TG Campbell. ♂ Sydney, 26 May 1923. ♀ Broulee, 26 Apr 1978, MS Upton. ♀ Wilson’s Valley, Mt. Kosciusko, 4700 ft, 26 Mar 1967, IFB Common. **Qld.**, ♂ 35 mls fr Wondai, 4 Jun 1959, E Exley (QM). ♂ Dunwich, SE Qld., 1 Oct 1978, A Molyneux (QM). ♀ Adar Ck., 20 Jan 1960, K Korboot (QM). ♀ Caloundra, 17 Aug 1934, FA Perkins (QM). **Tas.**, Sir John Falls Camp, 22 Feb 1976, D Coleman. ♀ 42.42°S 145.47°E, 16 Feb 1977, G Howard [by hand, probably C Howard]. ♀, 42.34°S 145.40°E, S.W. Tasmania, Butler Island, 10 Feb 1976, C Howard. **Vic.**, ♂ (1) ♀ (1), Mt. Pinnibar, 3500–4000 ft, 9 Mar 1967, KR Norris. ♀ Mt. Buffalo, 27 Mar 1949, IFB Common. **WA**, ♀ N. Perth. ♂ (1) ♀ (1), S31°35′ E115°48′, Cypress R[oa]d, Pinjar, 31 May 1981, MJ Smart. ♀ 37km W. of Binu, 9 Jul 1972, N McFarland. ♀ Hamel (QM).

FIGURE 17. *Sisyromyia rutila* (Walker, 1849). Types: (a, b) Holotype of *Bombylius rutilus* Walker, 1849 (NHMUK 010921896); (c, d) Holotype of *Bombylius albavittus* Macquart, 1850 (MNHN ED9263), photograph from digitized type collection of Muséum national d'Histoire naturelle: <https://science.mnhn.fr/institution/mnhn/collection/ed/item/ed9263>. (a, c) dorsal; (b, d) lateral. Scale bars = 1 mm.

Diagnosis. Large-sized fly, body mostly with reddish hairs. Wing membrane uniformly infuscated. Abdominal tergites 2–7 with median stripe consisting of dense, decumbent short white scales.

Redescription. Male. Body length 9.1–10.0 mm, wing length 10.5–11.5 mm.

Head. Head about 2.3 x wider than long, mostly blackish with thick pale pruinescence and covered in admixed pale yellow to golden scales and brown to black hairs. Eyes holoptic. Frons short, 2.1 x length of ocellar tubercle, upper narrow and black; lower half triangular, 0.9 x length of upper half, with thick pale pruinescence and golden scales admixed with black hairs. Ocellar tubercle slightly raised, blackish brown to black with grey pruinescence, with black hairs admixed with few golden scales. Face with thick pale pruinescence and golden scales admixed with

long black hairs, parafacial area with pale yellow scales. Gena with thick pale pruinescence and long pale yellow hairs. Clypeus with thick pale pruinescence and otherwise bare. Occiput with thick pale pruinescence and red scales admixed with some black hairs. Posterior eye margin slightly convex. Antennal scape and pedicel black with thick pale pruinescence, scape with long black hairs admixed with some golden scales ventrally, pedicel with long black hairs; flagellum black without pruinescence, subapex with 1 long ventral hair, dorsal face of basal half with 2–4 long hairs. Scape 3.0 x as long as wide, and 3.0 x as long as pedicel, uniform from base to apex. Pedicel as long as wide. Flagellum 8.0 x as long as wide, 1.7 x as long as scape + pedicel, 2.7 x as long as scape, conical and slightly laterally compressed, one-segmented with apical stylus (Fig. 18c). Palpus long, just extending beyond oral cavity, yellow with pale yellow hairs, one-segmented, without palpal pit. Mouthparts slender, 4.6 x as long as eye length, 3.5 x as long as head length, labellum thin and filiform (Fig. 18h).

FIGURE 18. *Sisyromyia rutila* (Walker, 1849). External (a–i (♂); j–o (♀)): (a, j) dorsal; (b, k) lateral; (c) antenna, lateral; (d) wing; (e, l) head, dorsal; (f, m) head, frontal; (g, n) head, profile; (h, o) head, lateral; (i) abdomen, dorsal. Scale bars = 1 mm (a, b, d–o); = 0.1 mm (c).

FIGURE 19. *Sisyromyia rutila* (Walker, 1849). Genitalia (a–e (♂); f, g (♀)): (a) genitalic capsule, dorsal; (b) genitalic capsule, ventral; (c) genitalic capsule, lateral; (d) epandrium, dorsal; (e) epandrium, lateral; (f) sternite 8, ventral; (g) genitalia and spermathecae. Scale bars = 0.1 mm.

Thorax. Integumental colour of scutum mostly black with sparse pale pruinescence. Scutum covered with short hairs, hairs pale yellow basally, turning reddish yellow on apical half and apex black. Scutellum brown with sparse pale pruinescence, with reddish yellow hairs, hairs apex turning black. Pleura black with thick pale pruinescence, mostly covered in long pale yellow hairs, except anepisternum with pale yellow hairs turning reddish on apical half and few hairs with black apex, anepimeron, meron, laterotergite and mediotergite bare.

Legs. Legs mostly brown, femora dark yellow. Femora with dense long pale yellow hairs admixed with few black hairs on basal half, apical half with more short yellow scales. Fore femur with some anterior bristles in the middle; mid femur with one row of anteroventral bristles and more separate bristles on apical half; hind femur with one row of anteroventral bristles, and some ventral bristles in the middle. Bristles and other hairs on legs brown. Fore tibia 1.7 x longer than fore basitarsus, mid tibia 2.1 x longer than mid basitarsus, hind tibia 2.0 x longer than hind basitarsus.

Wings. Wing membrane uniformly infuscated. Cell r_5 open, M_1 close to R_5 ; cell br nearly as long as cell bm , crossvein $r-m$ arising from base of cell dm ; crossvein $m-m$ nearly as long as crossvein $r-m$; cell cup open (Fig. 18d). Haltere stem and knob dark yellow.

Abdomen. Integumental colour of tergites black mostly with sparse pale pruinescence. Tergite 1 with thick pale pruinescence and dense reddish hairs; tergites 2–7 with long reddish hairs admixed with few black hairs, most of the reddish hairs with black apex, but less black apices laterally; tergites 2–7 with median stripe consisting of dense, decumbent short white scales. Sternites black except posterior margin yellow, with thick pale pruinescence, covered with pale yellow hairs, hairs turning reddish apically. **Genitalia.** Epandrium anterior margin slightly concave, posterior margin slightly convex (Fig. 19d). Lateral margin of gonocoxite nearly straight (Figs 19ab); lateral ejaculatory process narrow; inner and outer apices of gonocoxite short and acute; gap between inner apices of gonocoxites short and narrow; phallus nearly as long as gonocoxite (Fig. 19c).

Female. Body length 10.6–12.0 mm, wing length 10.3–13.5 mm. Very similar to male, except frons black with thick pale pruinescence, 3.4 x as wide as ocellar tubercle, frons with short golden scales admixed with long black hairs (Fig. 18l). Around 30 acanthophorite spines present on each side of tergite 9+10 (Fig. 19g).

Remarks. We examined the holotype of *Bombylius rutilus* and *Bombylius albavittus*, and determined the latter is a new junior synonym of the former.

Distribution. Australia (ACT, NSW, Qld., Tas., Vic., WA).

9. *Sisyromyia thomsoni* Evenhuis & Greathead, 1999

(Figs 20, 21, 29a)

Bombylius scutellaris Thomson, 1869: 488. Type-locality: Australia (NSW); holotype, NHRS. [Preoccupied by Wiedemann, 1828.]

Sisyromyia thomsoni Evenhuis & Greathead, 1999: 170 (new replacement name for *Bombylius scutellaris* Thomson, 1869).

Other specimen examined. Australia, ACT, ♀ Gibraltar Creek, 18 Oct 1967, Z Liepa. NSW, ♂ Killara, 6 Aug 1934, D Waterhouse. ♂ Narrabeen, 10 Aug 1935, MF Day. ♂ Mungo, Myall Lakes, 23 Aug 1934, D Waterhouse. ♀ (2) Medlow, 4 Oct 1926. ♂ Sydney, Feb 1952. Qld., ♀ -28.828 151.978, North slopes, Girraween NP, 14 Aug 2009, MG Jefferies (QM).

Diagnosis. Medium-sized fly, body with mostly brownish hairs. Wing membrane dark brown on anterior half and clear on posterior half. Male eyes holoptic. Gap between inner apices of gonocoxites narrow. Inner apex of gonocoxite short.

Redescription. Male. Body length 10.3–11.5 mm, wing length 9.9–10.4 mm.

Head. Head about 2.2 x wider than long, mostly blackish with thick pale pruinescence and covered in admixed white to black hairs and scales. Eyes holoptic. Frons short, 1.8 x length of ocellar tubercle, upper narrow and black; lower half triangular, 0.8 x length of upper half, with thick pale pruinescence and pale yellow to brown scales admixed with few brown hairs. Ocellar tubercle slightly raised, blackish brown to black with thick grey pruinescence, with long black hairs. Face with thick pale pruinescence and golden scales admixed with some long black hairs; parafacial area with long white scales admixed with long yellow hairs. Gena with thick pale pruinescence and long white to yellow hairs. Clypeus with thick pale pruinescence and otherwise bare. Occiput with thick pale pruinescence and white to brown scales. Posterior eye margin slightly convex. Antennal scape and pedicel brown

with thick pale pruinescence, scape with long black hairs admixed with few golden hairs laterally, pedicel with short black hairs; flagellum black without pruinescence, subapex with 3–5 long hairs. Scape 2.9 x as long as wide, and 2.5 x as long as pedicel, uniform from base to apex. Pedicel 1.3 x as long as wide. Flagellum 8.0 x as long as wide, 1.6 x as long as scape + pedicel, 2.4 x as long as scape, conical and slightly laterally compressed, one-segmented with apical stylus (Fig. 20c). Palpus long, just extending beyond oral cavity, dark yellow with pale yellow hairs, except apex with black hairs, one-segmented, without palpal pit. Mouthparts slender, 3.1 x as long as eye length, 2.1 x as long as head length, labellum thin and filiform (Fig. 20h).

FIGURE 20. *Sisyromyia thomsoni* Evenhuis & Greathead, 1999. External (a–i (♂); j–o (♀)): (a, j) dorsal; (b, k) lateral; (c) antenna, lateral; (d) wing; (e, l) head, dorsal; (f, m) head, frontal; (g, n) head, profile; (h, o) head, lateral; (i) abdomen, dorsal. Scale bars = 1 mm (a, b, d–o); = 0.1 mm (c).

FIGURE 21. *Sisyromyia thomsoni* Evenhuis & Greathead, 1999. Genitalia (a–e (♂); f, g (♀)): (a) genitalic capsule, dorsal; (b) genitalic capsule, ventral; (c) genitalic capsule, lateral; (d) epandrium, dorsal; (e) epandrium, lateral; (f) sternite 8, ventral; (g) genitalia and spermathecae. Scale bars = 0.1 mm.

Thorax. Integumental colour of scutum mostly black with thick brown pruinescence except two median wide white pruinescent stripes, postalar callus brown with sparse pale pruinescence. Scutum covered with short pale yellow to brown hairs, admixed with few short black hairs, lateral stripe consisting of short white to pale yellow scales, and posteriorly with few short white scales. Six brownish yellow notopleural setae present. Scutellum black with sparse pale pruinescence, anterior margin with an indistinct band consisting of short white scales, posterior margin with long brown hairs admixed with some long black hairs. Pleura black with thick pale pruinescence, mostly covered in long pale yellow hairs, except dorsal half of anepisternum with brown hairs, anepimeron, meron, laterotergite and mediotergite bare.

Legs. Legs mostly brown, except tibiae yellow. Femora with long brown hairs. Mid femur with one anterior bristle on apical half; hind femur with one row of anteroventral bristles and one row of posteroventral bristles, more separate bristles on apical half. Bristles and other hairs on legs brown. Fore tibia 2.0 x longer than fore basitarsus, mid tibia 2.3 x longer than mid basitarsus, hind tibia 2.2 x longer than hind basitarsus.

Wings. Wing membrane dark brown on anterior half and clear on posterior half, darker towards wing base. Cell r_5 open, M_1 close to R_5 ; cell br nearly as long as cell bm , crossvein $r-m$ arising from base of cell dm ; crossvein $m-m$ nearly as long as crossvein $r-m$; cell cup open (Fig. 20d). Haltere stem brown, and knob yellow.

Abdomen. Integumental colour of tergites black mostly with sparse pale pruinescence. Tergite 1 with thick pale pruinescence and dense brown hairs; tergites 2–7 with yellow to brown hairs, more pale hairs on anterior half, posterior half admixed with some black hairs, hairs darker and denser laterally, and with median stripe consisting of dense, decumbent short white scales; tergites 3–7 with pale yellow to white scales on lateral side, best viewed from posterodorsal side. Sternites black except posterior margin yellow, with thick pale pruinescence, covered with pale yellow to brown hairs, hairs darker laterally. **Genitalia.** Epandrium anterior margin slightly concave, posterior margin slightly convex (Fig. 21d). Lateral margin of gonocoxite nearly straight (Figs 21ab); lateral ejaculatory process wide; inner apex of gonocoxite short and acute, outer apex of gonocoxite long and sharp; gap between inner apices of gonocoxites narrow; phallus shorter than gonocoxite (Fig. 21c).

Female. Body length 7.4–11.1 mm, wing length 9.1–12.2 mm. Very similar to male, except frons black with thick pale pruinescence, 3.4 x as wide as ocellar tubercle, frons with short golden scales admixed with long black hairs (Fig. 20l). Body hairs paler than male. Around 30 acanthoporphite spines present on each side of tergite 9+10 (Fig. 21g).

Remarks. *Bombylius scutellaris* was first considered a synonym of *Sisyromyia decorata* by Roberts (1928: 429). However, this synonymy was not followed by Evenhuis & Greathead (1999). We compared the specimens from NSW and WA, and agree with Evenhuis & Greathead's decision (also see '4. *Sisyromyia decorata* (Walker, 1849)' earlier). Therefore, *Sisyromyia thomsoni* is recognised as a valid species in the present revision.

Sisyromyia thomsoni is similar to *Sisyromyia decorata*, but differs as follows: male eyes holoptic; gap between inner apices of gonocoxites narrow; inner apex of gonocoxite short.

Distribution. Australia (ACT, NSW, Qld.).

10. *Sisyromyia umbra* sp. nov.

(Figs 22, 23)

Type specimens. **Holotype** ♂ Australia, NSW, 28°24'S 153°16'E, Mt. Warning, 10 Oct 1992, R Eastwood (AM: K542359).

Paratype ♂ (2), Australia, NSW, same data as holotype (AM: K542360-K542361).

Other specimen examined. Australia, **NSW**, ♂ Mt. Tomah, Blue Mtns., 25 Aug 1973, NW Rodd (AM: K542362). ♀ Mt. Tomah, 5 Oct 1977 (AM: K542363). ♀ Clyde Mt nr Braidwood, 23 Sep 1952, SJ Paramonov (ANIC).

Diagnosis. Medium-sized fly, body with mostly brownish hairs. Wing membrane dark brown, slightly lighter towards posterior margin. Anterior margin of scutellum with a band consisting of short white scales.

Description. Male. Body length 8.0–9.2 mm, wing length 9.6–9.9 mm.

Head. Head about 2.1 x wider than long, mostly blackish with thick pale pruinescence and covered in admixed white to black hairs and scales. Eyes holoptic. Frons short, 1.9 x length of ocellar tubercle, upper narrow and black; lower half triangular, 0.9 x length of upper half, with dense pale pruinescence and admixed golden and blackish

FIGURE 22. *Sisyromyia umbra* **sp. nov.** External (a–i (♂); j–o (♀)): (a, j) dorsal; (b, k) lateral; (c) antenna, lateral; (d) wing; (e, l) head, dorsal; (f, m) head, frontal; (g, n) head, profile; (h, o) head, lateral; (i) abdomen, dorsal. Scale bars = 1 mm (a, b, d–o); = 0.1 mm (c).

FIGURE 23. *Sisyromyia umbra* sp. nov. Genitalia (a–e (♂); f, g (♀)): (a) genitalic capsule, dorsal; (b) genitalic capsule, ventral; (c) genitalic capsule, lateral; (d) epandrium, dorsal; (e) epandrium, lateral; (f) sternite 8, ventral; (g) genitalia and spermathecae. Scale bars = 0.1 mm.

brown hairs. Ocellar tubercle slightly raised, blackish brown to black with grey pruinescence, with long black hairs but golden basally. Face with thick grey pruinescence and golden scales admixed with some long black hairs, parafacial area with thick pale pruinescence and long pale yellow to white scales. Gena with thick pale pruinescence and long white hairs, admixed with few brown hairs. Clypeus with sparse grey pruinescence and otherwise bare. Occiput with sparse pale pruinescence and brown hairs admixed with black hairs. Posterior eye margin slightly convex. Antennal scape and pedicel blackish brown with sparse pale pruinescence, scape with long brown hairs admixed with few golden scales, pedicel with short brown hairs; flagellum black but turning brown apically, without pruinescence, subapex with 3 long hairs. Scape 2.6 x as long as wide, and 2.5 x as long as pedicel, uniform from base to apex. Pedicel 1.3 x as long as wide. Flagellum 7.0 x as long as wide, 1.9 x as long as scape + pedicel, 2.7 x as long as scape, conical and slightly laterally compressed, one-segmented with apical stylus (Fig. 22c). Palpus long, just extending beyond oral cavity, brown with white hairs, one-segmented, without palpal pit. Mouthparts slender, 3.2 x as long as eye length, 2.0 x as long as head length, labellum thin and filiform (Fig. 22h).

Thorax. Integumental colour of scutum mostly black with sparse pale pruinescence, pruinescence thicker laterally. Scutum covered with short brown hairs admixed with some short golden scales, hairs turning black apically, lateral stripe consisting of short white scales. Four brownish yellow notopleural setae present. Scutellum black with sparse pale pruinescence, anterior half with a band consisting of short white scales, posterior half with long brown to black hairs admixed with some golden scales. Pleura black with thick pale pruinescence, mostly covered in long pale yellow hairs, except dorsal half of anepisternum with brown hairs, anepimeron, meron, laterotergite and mediotergite bare.

Legs. Legs mostly dark yellow, tarsi turning brown in apical segments. Femora mostly covered in white hairs and scales, except anterior face of apical half with short yellow scales. Mid femur with two anterior bristles on apical half; hind femur with one row of anteroventral bristles and more separate bristles on apical half. Bristles and other hairs on legs brown. Fore tibia 2.0 x longer than fore basitarsus, mid tibia 2.4 x longer than mid basitarsus, hind tibia 2.2 x longer than hind basitarsus.

Wings. Wing membrane dark brown, slightly lighter towards posterior margin. Cell r_5 open, M_1 close to R_5 ; cell br nearly as long as cell bm , crossvein $r-m$ arising from base of cell dm ; crossvein $m-m$ nearly as long as crossvein $r-m$; cell cup open (Fig. 22d). Haltere stem brown, knob dark yellow.

Abdomen. Integumental colour of tergites black mostly with sparse pale pruinescence. Tergite 1 with thick pale pruinescence and dense brown hairs; tergites 2–7 with sparse brown scales admixed with long black hairs, hairs denser on posterior half, scales and hairs denser laterally; tergites 3–7 with median stripe consisting of dense, decumbent short golden scales. Sternites black except posterior margin yellow, with thick pale pruinescence, covered with white hairs admixed with few brown hairs. **Genitalia.** Epandrium anterior margin slightly concaved, posterior margin straight (Fig. 23d). Lateral margin of gonocoxite strongly curved (Figs 23ab); lateral ejaculatory process narrow; inner apex of gonocoxite short and narrow, outer apex of gonocoxite long and rounded; gap between inner apices of gonocoxites short and narrow; phallus shorter than gonocoxite (Fig. 23c).

Female. Body length 9.1–9.7 mm, wing length 10.1–12.9 mm. Very similar to male, except frons black with thick pale pruinescence, 3.2 x as wide as ocellar tubercle, frons with long brown to black hairs admixed with some short golden scales (Fig. 22l). Around 30 acanthophorite spines present on each side of tergite 9+10 (Fig. 23g).

Remarks. *Sisyromyia umbra* **sp. nov.** is similar to *Sisyromyia rutila*, but differs as follows: body with mostly brownish hairs; wing colour dark brown; anterior margin of scutellum with a band consisting of short white scales.

Etymology. The specific name refers to the dark wing colour.

Distribution. Australia (NSW).

11. *Sisyromyia vittata* **sp. nov.**

(Figs 24, 25, 29b)

Type specimens. **Holotype** ♂ Australia, WA, -32.0607 116.5163, York, *Leucopogon* sp., 24 Aug 2018, J & F Hort (WAM).

Paratype ♂ Australia, WA, same data as holotype.

Other specimen examined. Australia, **WA**, ♀ (2), -31.9823 116.5095, York, *Leucopogon* sp., 8 Aug 2018, J & F Hort. ♂ (4), -32.0526 116.5435, York, *Leucopogon* sp., 12 Aug 2018, J & F Hort. ♂ (1) ♀ (3), -32.0526 116.5435,

York, *Leucopogon* sp., 19 Aug 2018, J & F Hort. ♂ S31°31' E115°42', Nr. Parrot Ridge, 12 Sep 1982, MJ Smart. ♀ S31°31' E115°42', Nr. Parrot Ridge, 26 Sep 1982, MJ Smart.

Diagnosis. Medium-sized fly, body with mostly yellow hairs. Wing membrane brown. Scutum with one dorsocentral stripe, abdominal tergites 2–6 with lateral stripe, stripes consist of sparse, decumbent golden scales. Inner apex of gonocoxite widely separated.

Description. Male. Body length 10.6 mm, wing length 12.5 mm.

Head. Head about 2.5 x wider than long, mostly blackish with thick pale pruinescence and covered in admixed pale yellow to golden scales and black hairs. Eyes dichoptic, narrowly separated by 0.9 x width of ocellus. Frons short, 1.3 x length of ocellar tubercle, upper narrow and black; lower half triangular, 3.3 x length of upper half, with sparse pale pruinescence and golden scales admixed with few black hairs. Ocellar tubercle slightly raised, blackish brown to black with sparse grey pruinescence, with long black hairs admixed with few golden hairs. Face with thick pale pruinescence and golden scales admixed with some long black hairs. Gena with thick pale pruinescence and long pale yellow hairs. Clypeus with thick pale pruinescence and otherwise bare. Occiput with thick pale pruinescence and golden scales, admixed with few black hairs. Posterior eye margin slightly convex. Antennal scape and pedicel black with thick pale pruinescence, scape with long black hairs admixed with golden scales laterally, pedicel with short black hairs; [flagellum broken]. Palpus long, just extending beyond oral cavity, brown except apex black, with brown hairs admixed with few black hairs, one-segmented, without palpal pit. Mouthparts slender, 4.0 x as long as eye length, 2.2 x as long as head length, labellum thin and filiform (Fig. 24e).

Thorax. Integumental colour of scutum mostly black with sparse pale pruinescence except postalar callus brown. Scutum covered with yellow hairs, admixed with some short black hairs; with one dorsocentral stripe and one lateral marginal stripe consisting of dense, decumbent short golden scales. Four brownish yellow notopleural setae present. Scutellum brown with sparse pale pruinescence, with short golden scales and long golden hairs, admixed with some long black hairs, black hairs denser posteriorly. Pleura black with thick pale pruinescence, mostly covered in long pale yellow hairs, except anepisternum with golden hairs admixed with some black hairs, anepimeron, meron, laterotergite and mediotergite bare.

Legs. Legs mostly brown, except femora black basally. Femora with golden and black hairs, black hairs denser on anterior face and apical half. Mid femur with one anterior bristle on apical half; hind femur with one row of anteroventral bristles and more separate bristles on apical half. Bristles and other hairs on legs brown. Fore tibia 2.3 x longer than fore basitarsus, mid tibia 2.7 x longer than mid basitarsus, hind tibia 2.3 x longer than hind basitarsus.

Wings. Wing membrane brown, with darker towards wing base. Cell r_5 open, M_1 close to R_5 ; cell br nearly as long as cell bm , crossvein $r-m$ arising from base of cell dm ; crossvein $m-m$ nearly as long as crossvein $r-m$; cell cup open. Haltere stem yellow, knob pale yellow.

Abdomen. Integumental colour of tergites black mostly with sparse pale pruinescence. Tergite 1 with thick pale pruinescence and dense golden hairs, admixed with few black hairs laterally; tergite 2 with long golden hairs on anterior half and laterally, and with long black hairs on posterior half; tergites 2–7 with sparse long black hairs and dense long golden hairs laterally; tergites 2–6 with lateral stripe consisting of sparse, decumbent golden scales; tergites 2–7 with median stripe consisting of dense, decumbent short white scales. Sternites black except posterior half yellow, with thick pale pruinescence, covered with golden hairs. **Genitalia.** Epandrium anterior margin slightly concave, posterior margin straight (Fig. 25d). Lateral margin of gonocoxite nearly straight (Figs 25ab); lateral ejaculatory process wide; inner and outer apices of gonocoxite long and acute; gap between inner apices of gonocoxites wide; phallus shorter than gonocoxite (Fig. 25c).

Female. Body length 9.8 mm, wing length 11.9 mm. Very similar to male, except frons black with thick pale pruinescence, 3.0 x as wide as ocellar tubercle, frons with short golden scales admixed with long black hairs (Fig. 22l). Flagellum black but turning brown apically, without pruinescence, subapex with 5 long hairs. Scape 2.0 x as long as wide, and 2.0 x as long as pedicel, uniform from base to apex. Pedicel 1.2 x as long as wide. Flagellum 12.0 x as long as wide, 2.4 x as long as scape + pedicel, 3.4 x as long as scape, conical and slightly laterally compressed, one-segmented with apical stylus (Fig. 22j). Around 20 acanthophorite spines present on each side of tergite 9+10 (Fig. 23g).

Remarks. *Sisyromyia vittata* sp. nov. is similar to *Sisyromyia rutila*, but differs in having smaller body-size, the scutum and abdomen with golden stripes, and the inner apex of gonocoxite widely separated.

Etymology. The specific name refers to the scutum and abdomen with golden stripes.

Distribution. Australia (WA).

FIGURE 24. *Sisyromyia vittata* sp. nov. External (a–g (♂); h–o (♀)): (a, h) dorsal; (b, i) lateral; (c, l) head, dorsal; (d, m) head, frontal; (e, n) head, profile; (f, o) head, lateral; (g) abdomen, dorsal; (j) antenna, lateral; (k) wing. Scale bars = 1 mm (a–i, k–o); = 0.1 mm (j).

FIGURE 25. *Sisyromyia vittata* **sp. nov.** Genitalia (a–e (♂); f, g (♀)): (a) genitalic capsule, dorsal; (b) genitalic capsule, ventral; (c) genitalic capsule, lateral; (d) epandrium, dorsal; (e) epandrium, lateral; (f) sternite 8, ventral; (g) genitalia and spermathecae. Scale bars = 0.1 mm.

Species excluded from *Sisyromyia*

12. *Dissodesma binghi* (Evenhuis, 1989) **comb. nov.**

(Figs 26–28)

Bombylius brevirostris Macquart, 1850: 423(119). Type locality: “Tasmanie” [error, probably = Australia (NSW)] [H in MNHN]. [Preoccupied by Olivier, 1789.]

*Systoechus eulabiatu*s Bigot, 1892: 366. Type locality: “Van-Diémen” [= Australia (Tas.)] [H in UNKN].

Sisyromyia binghi Evenhuis, 1989: 364 (new replacement name for *Bombylius brevirostris* Macquart, 1850). *brevirostris*, incorrect original spelling of *brevirostris* (Macquart, 1840: pl. 7, fig. 7 [1841: pl. 7, fig. 7]).

Type specimen. **Holotype** of *Bombylius brevirostris* Macquart, ♀ (MNHN ED9271) (Fig. 24).

Other specimen examined. Australia, **ACT**, ♂ Gibraltar Peak, 9 Sep 1948. **NSW**, ♂ 5mi. S. Mendooran, 18 Mar 1972. G Daniels. ♂ (2) ♀ (3), Gundamain, Port Hacking, National Park, 1 Mar 1926, Mackerras. **SA**, ♀ Black Hill, near Montacute, Adelaide, 6 Mar 1949, HF Lower. **Tas.**, ♀ Freycinet Nat[ional] P[ar]k, 28 Feb 1963, IFB Common & MS Upton.

Redescription. **Male.** Body length 7.0–9.6 mm, wing length 7.3–10.0 mm.

Head. Head about 2.0 x wider than long, mostly blackish with thick white pruinescence and covered in admixed white to pale yellow scales and hairs. Eyes holoptic. Frons long, 3.6 x length of ocellar tubercle, upper narrow and black; lower half triangular, 1.6 x length of upper half, with thick pale pruinescence and pale yellow hairs. Ocellar tubercle slightly raised, blackish brown to black with grey pruinescence, with long pale yellow hairs. Face with thick white pruinescence and long pale yellow scales, parafacial area with white scales. Gena with thick white pruinescence and long white hairs. Clypeus with thick pale pruinescence and otherwise bare. Occiput with thick white pruinescence and dense pale yellow scales. Posterior eye margin slightly concave. Antennal scape and pedicel black, scape with thick pale pruinescence and long pale yellow hairs, pedicel with sparse pale pruinescence and short pale yellow hairs; flagellum black without pruinescence. Scape 3.3 x as long as wide, and 3.6 x as long as pedicel, uniform from base to apex. Pedicel 1.1 x as long as wide. Flagellum 10.4 x as long as wide, 1.5 x as long as scape + pedicel, 1.9 x as long as scape, conical and slightly laterally compressed, one-segmented with apical stylus (Fig. 25c). Palpus short, not extending beyond oral cavity, yellow with short black hairs, one-segmented, without palpal pit. Mouthparts slender, 3.9 x as long as eye length, 2.2 x as long as head length, labellum thin and filiform (Fig. 25h).

Thorax. Integumental colour of scutum mostly black with thick grey pruinescence. Scutum covered with pale yellow hairs admixed with few black hairs near posterior margin, pale yellow hairs darker apically. Three yellow notopleural setae present. Scutellum black with sparse pale pruinescence, covered with long yellow hairs, posterior margin admixed with some strong black hairs. Pleura black with thick pale pruinescence, mostly covered in long pale yellow hairs, except anepimeron, meron, laterotergite and mediotergite bare.

FIGURE 26. *Dissodesma binghi* (Evenhuis, 1989) **comb. nov.** Holotype of *Bombylius brevirostris* Macquart, 1850 (ED9271). (a) dorsal; (b) lateral. Scale bars = 1 mm.

Legs. Legs mostly blackish brown except fore and mid femora dark yellow apically, fore and mid tibiae yellow. Femora covered in pale yellow scales, ventral face with long pale yellow hairs. Hind femur with one row of anteroventral yellow bristles. Mid and fore tibiae covered in pale yellow scales, anterior face admixed with some brown scales. Other bristles and hairs on legs brownish yellow. Fore tibia 1.7 x longer than fore basitarsus, mid tibia 2.4 x longer than mid basitarsus, hind tibia 2.2 x longer than hind basitarsus.

Wings. Wing membrane slightly infuscated, darker towards wing base and along costa. Cell *r*₅ narrowly open; cell *br* nearly as long as cell *bm*, crossvein *r-m* arising from base of cell *dm*; crossvein *m-m* nearly as long as crossvein *r-m*; cell *cup* open (Fig. 25d). Haltere stem yellow, knob pale yellow.

Abdomen. Integumental colour of tergites black mostly with sparse grey pruinescence. Tergite 1 with dense yellow hairs; tergites 2 to 4, and 7 to 8 with yellow hairs, admixed few long black hairs laterally and on posterior margin; tergites 5 and 6 admixed with dense long black hairs laterally. Sternites black except posterior margin yellow, with thick pale pruinescence, covered with pale yellow scales and hairs. **Genitalia.** Epandrium wide and short, anterior margin nearly straight, posterior margin strongly concave (Fig. 26d). Hypandrium present. Gonocoxal apex with slightly narrower than the base in dorsal view, ejaculatory apodeme small (Figs 26ab); gonocoxal apodeme strong and incurved; lateral ejaculatory process strong; inner apex of gonocoxite acute, slender and elongate; outer apex of gonocoxite acute, normal length; dorsal bridge with lateral hollow; gonostylus normal; phallus strong, as long as gonocoxite (Fig. 26c).

Female. Body length 5.2–8.4 mm, wing length 5.5–9.0 mm. Very similar to male, except frons black with thick pale pruinescence, 3.0 x as wide as ocellar tubercle, frons with short white to pale yellow scales on lower half, long pale yellow hairs on upper half, admixed with some long black hairs (Fig. 25k). Tergite 8 with thick hairs, 6 acanthophorite spines present on each side of tergite 9+10, slightly curved apically. Genital fork slender and straight, connect at apex. Sperm pump strong and long, with some lateral papillae; distal spermathecal duct of normal length, thickened in apical half; spermatheca small and nearly spherical, apex rounded (Fig. 26g).

Remarks. *Systoechus eulabiat* was first proposed as a junior synonym of *Bombylius brevirostris* by White (1916), and followed by Roberts (1928), but it was not followed by Evenhuis & Greathead (1999).

The holotype of *B. brevirostris* was identified and examined by the senior author during his visit to MNHN, found in a very bad condition (Fig. 24). This holotype was examined by Evenhuis & Greathead (1999), but without a type label when Li visited MNHN in Sep 2018. The holotype was re-identified by Li, who added the holotype label and a label stating “Holotype identified by Xuankun Li Sep 2018” (Fig. 24).

The deposition of the holotype of *S. eulabiat* is unknown, and we have not located it. By comparing the specimens from NSW and Tas., we agree with the arrangement by White (1916), and treat *S. eulabiat* as a synonym of *B. brevirostris*.

B. brevirostris was included in *Sisyromyia* when the genus was established (White, 1916), but the name was subsequently replaced by *Sisyromyia binghi* Evenhuis, 1989 due to preoccupation.

Based on the genitalia characters of both male and female, this species belongs to the genus *Dissodesma* Bowden & Li, 2018 (Li and Yeates, 2018). Therefore, *Dissodesma binghi* is a new combination proposed in the present study.

Distribution. Australia (ACT, NSW, SA, Tas.).

Discussion

Two widely distributed species are found in *Sisyromyia*: *S. aurata* and *S. rutila*. Based on the specimens examined in the present study, these two species have continuous distributions from the east coast (NSW, Qld., Tas.), through central south Australia (SA, Vic.), to the west coast (WA). However, the distribution of most known species of Australian Bombyliinae are much more restricted.

Based on the few specimens available for study, we could not find any stable morphological difference between specimens from different, geographically separated populations of these two species. When more specimens from throughout the species ranges are available the limits of these two species should be reassessed.

FIGURE 27. *Dissodesma binghi* (Evenhuis, 1989) **comb. nov.** External (a–h (♂); i–n (♀)): (a, i) dorsal; (b, j) lateral; (c) antenna, lateral; (d) wing; (e, k) head, dorsal; (f, l) head, frontal; (g, m) head, profile; (h, n) head, lateral. Scale bars = 1 mm (a, b, d–n); = 0.1 mm (c).

FIGURE 28. *Dissodesma binghi* (Evenhuis, 1989) **comb. nov.** Genitalia (a–e (♂); f, g (♀)): (a) genitalic capsule, dorsal; (b) genitalic capsule, ventral; (c) genitalic capsule, lateral; (d) epandrium, dorsal; (e) epandrium, lateral; (f) sternite 8, ventral; (g) genitalia and spermathecae. Scale bars = 0.1 mm.

FIGURE 29. *Sisyromyia* females visiting *Leucopogon* sp. flowers from WA. (a) *Sisyromyia thomsoni* Evenhuis & Greathead; (b) *Sisyromyia vittata* **sp. nov.** Photograph by Jean and Fred Hort.

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