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ZYZZARRO, A NEW GENUS OF PSILODEROIDINAE (DIPTERA:
MYTHICOMYIIDAE) FROM WESTERN AUSTRALIA
FOUND ON SOCIAL MEDIA

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Cover photo: *Zyzzarro hortorum* Evenhuis, gen. nov, sp. nov., female visiting flowers of *Astartea scoparia* Schauer in Western Australia. Photo: Jean Hort.

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***Zyzzarro*, a new genus of Psiloderoidinae (Diptera: Mythicomyiidae) from Western Australia found on social media¹**

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Abstract. The new genus *Zyzzarro*, **n. gen.** and its type species *Zyzzarro hortorum*, **n. sp.** is described and illustrated. It is most similar to *Acridophagus* Evenhuis, but is easily separated by the longer proboscis, the parallel-sided oral margin and long indentation on the inner eye margin.

Psiloderoidine flies are uncommon in most collections worldwide but are fairly frequently found in Australia. An unusual mythicomyiid fly initially photographed visiting flowers was identified from images that were posted on the social media site Flickr (e.g., https://www.flickr.com/photos/jean_hort/11867923353/) as a probable new genus. After notifying the photographers, specimens were observed again, collected in 2014 and 2017, and sent for study. The new genus is described and illustrated below and compared to and contrasted with other known mythicomyiids. A number of new genera of mythicomyiids (and some having been misidentified) have been found among thousands of specimens studied and will be described in a forthcoming review of the subfamily Psiloderoidinae in Australia. Some are included in the key provided below and labeled as New Genus A, B, and C. This paper serves to put a name to the species seen frequently online and to give credit to its discoverers and photographers, Jean and Fred Hort of Western Australia.

MATERIAL AND METHODS

Specimens studied derive from collections made by Jean and Fred Hort in the Perth area of Western Australia. Type material is deposited in the Western Australian Museum (WAMP).

Genitalic preparations were made by macerating parts in either hot lactic acid (a few minutes) or overnight in an enzymatic solution used for cleaning contact lenses (see Yau & Marshall, 2015), washing in distilled water, and dissecting and examining in concave slides in a medium of Purell[®] Hand sanitizer mixed with a drop of 95% ethanol; male genitalia are preserved in microvials pinned below the specimen; female genitalia are mounted on slides. Images of various morphological structures were accomplished by using a Leica M165C stereo dissecting scope via the Leica Microsystems LASX Multifocus software (v. 4.12.0) and using Zerene Stacker[®] software (v. 1.04) (Zerene Systems, LLC, Richmond, Washington, USA) to align and stack-focus each final image. Morphological terminology follows Cumming & Wood (2017).

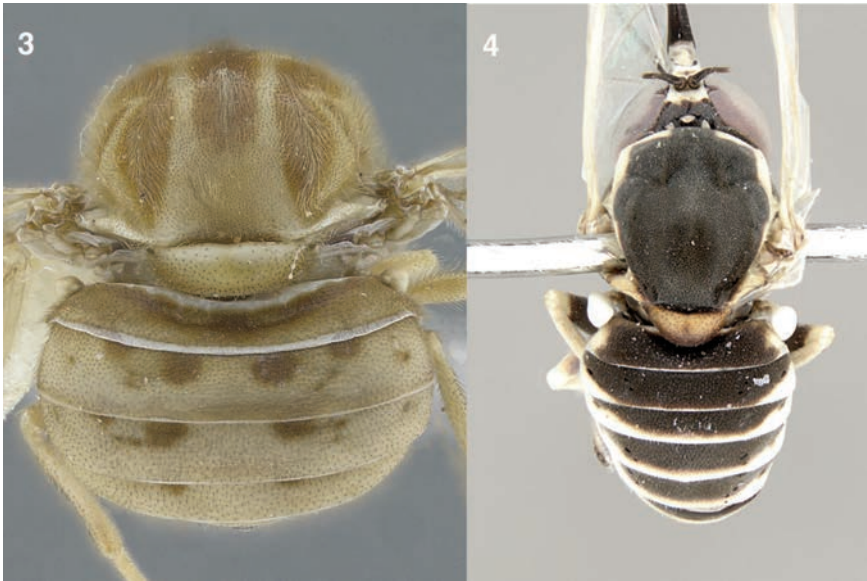
1. Contribution No. 2022-006 to the Pacific Biological Survey.



Figures 1–2. Psiloderoidinae genera mouthparts. **1.** New genus A, showing vestigial mouthparts. **B.** *Zyzzarro hortorum* male, showing functional mouthparts.

KEY TO AUSTRALIAN PSILODEROIDINAE

1. Mouthparts extremely reduced or vestigial, not exceeding oral margin (Fig. 1); generally large, plump looking flies, abdomen much wider than thorax (Fig. 3) **New genus A**
- Mouthparts normal, extending beyond the oral margin or as long as oral margin (e.g. Fig. 2); much smaller, thinner flies; abdomen as wide or wider than thorax, but if wider, not to the extreme as described above (Fig. 4) **2**
2. Crossvein r-m beyond middle of discal cell (Fig. 5); cell br longer than cell bm ... **3**
- Crossvein r-m at or before middle of discal cell (Fig. 6); cell br subequal in length to cell bm **4**
3. Face narrow, not widened at oral margin; with small protruding tip (Fig. 2), proboscis long, longer than head height; indentation on inner eye margin long, ca. length of 7–8 ommatidia (Fig. 11); male genitalia not rotated 90° *Zyzzarro* Evenhuis, **gen. nov.**
- Face broader than above, widened and receding at oral margin, without small protruding tip; proboscis barely extends beyond oral margin; indentation of inner eye margin very short, ca. length of 2–3 ommatidia (Fig. 10); male genitalia rotated 90° *Acridophagus* Evenhuis
4. Face much shorter than frons (Fig. 8); proboscis long, tubular, with pointed tip (Fig. 12) **New genus B**
- Face as long as frons (Fig. 9); proboscis long or short, not pointed apically (Fig. 13) **New genus C**



Figures 3–4. Psiloderoidinae abdomens. 3, New genus A. 4, New genus B.

***Zyzzarro* Evenhuis, gen. nov.**

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Type species: *Zyzzarro hortorum* Evenhuis, **sp. nov.**, by present designation.

Diagnosis. Similar to *Acridophagus* in overall general appearance and possessing a wing with crossvein r-m well beyond the middle of cell dm, but can be separated from it by the proboscis exceeding the head height (proboscis barely extends beyond oral margin in *Acridophagus*), the parallel-sided oral margin (widened or flared apically in *Acridophagus*), and the indentation on the inner eye margin long (length of 8 or more ommatidia) (indentation in *Acridophagus* very small, length no more than 3–4 ommatidia).

Distribution. Western Australia.

Included species. *Zyzzarro hortorum* Evenhuis, **sp. nov.**

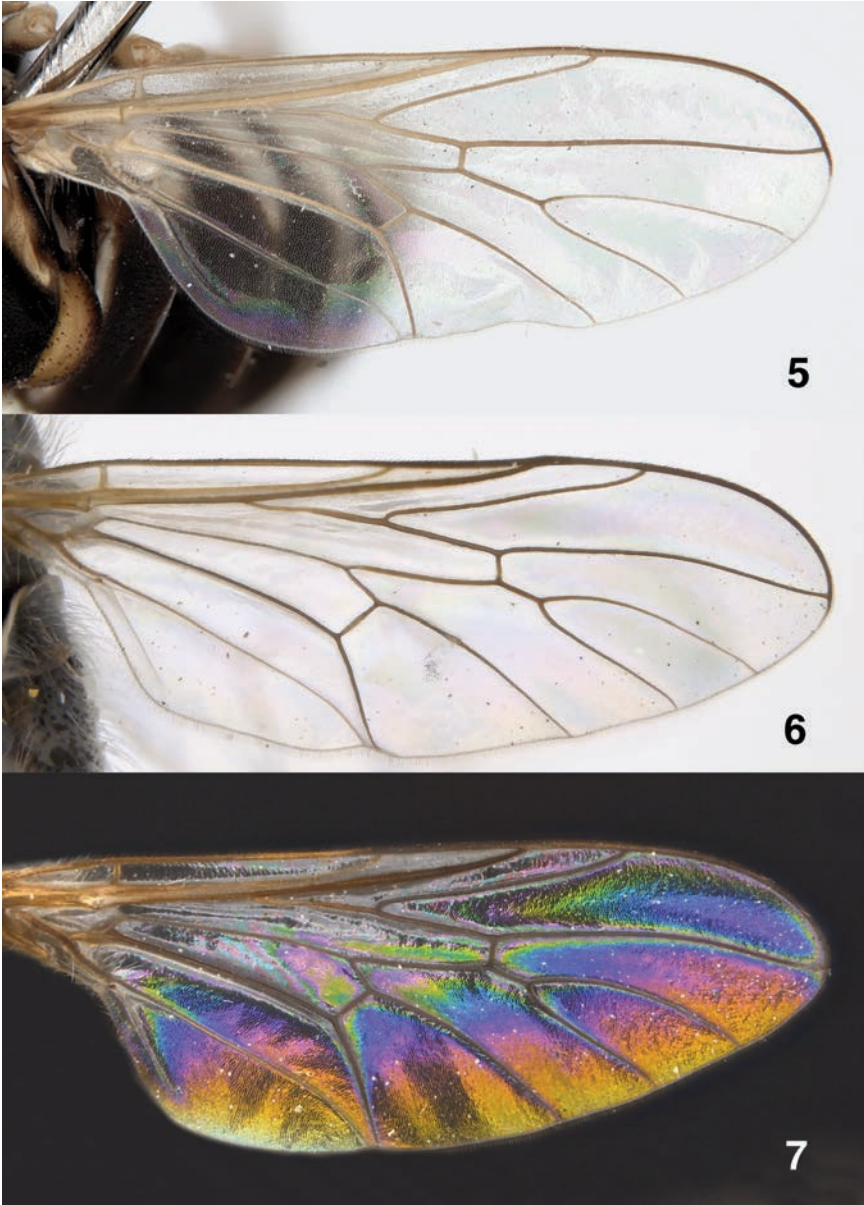
Etymology: The genus name is a fantasy dragon name, which means “The Gray One”. Gender is neuter.

***Zyzzarro hortorum* Evenhuis, sp. nov.**

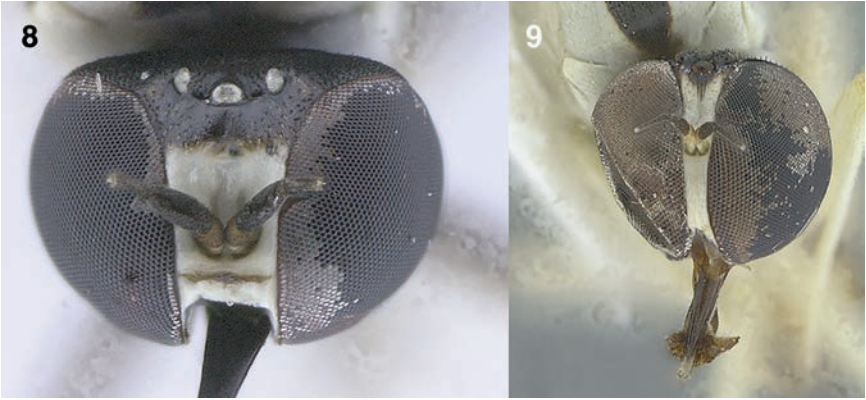
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(Figs. 2, 6, 7, 11, 14–20)

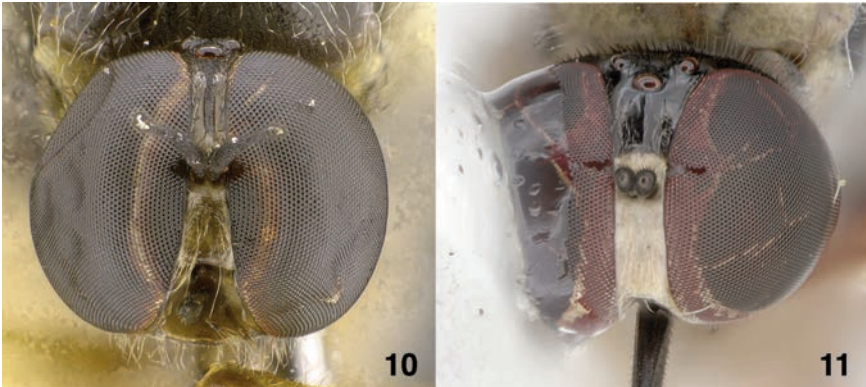
Types. *Holotype* ♂ and 7♂, 8♀ *paratypes* from AUSTRALIA: **Western Australia:** Wandering, 32.4327°S, 116.4089°E, 3 Jan 2014, on *Astartea scoparia*, J. & F. Hort (WAMP). *Other paratypes:* AUSTRALIA: **Western Australia:** 11♂, same data except, 32.4290°S, 116.3982°E, swarming in Jarrah [*Eucalyptus marginata*] (WAMP); 2♂, Clare [Jarrahdale] State Forest, Armidale, 32.2311°S, 116.2996°E, 7 Jan 2017, J. & F. Hort (WAMP). *Holotype* in WAMP. *Paratypes* in WAMP and BPBM.



Figures 5–7. Psiloderoidinae wings. 5, New genus B. 6, *Zyzzarro hortorum*. 7, *Zyzzarro hortorum*, Wing Interference Pattern.



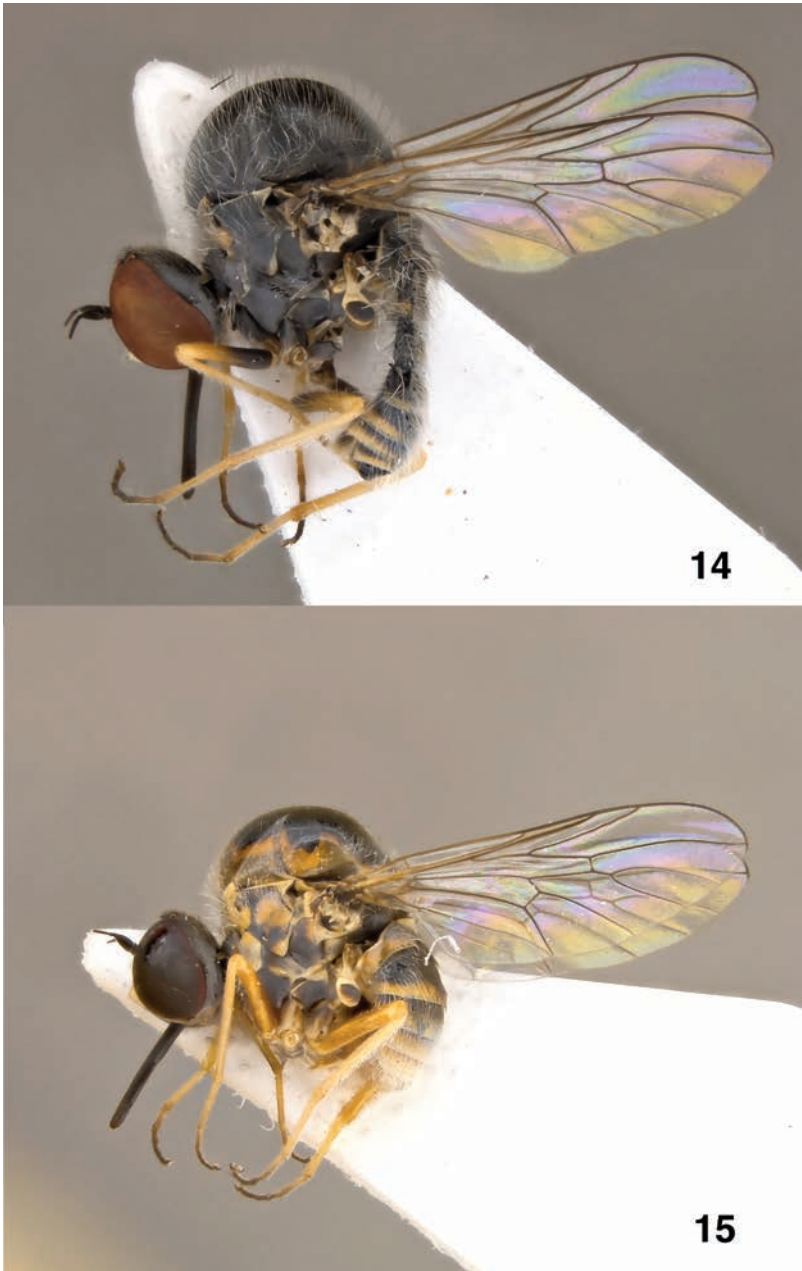
Figures 8–9. Psiloderoidinae heads, frontal view. 8, New genus B. 9, New genus C.



Figures 10–11. Psiloderoidinae heads, frontal view showing indentation on inner eye margin. 10, *Acridophagus* n. sp. 11, *Zyzzarro hortorum*.



Figures 12–13. Psiloderoidinae proboscides. 12, New genus B. 13, New genus C.



Figures 14–15. *Zyzzarro hortorum*, habitus, lateral view. 14, Male. 15, Female.



Figures 16–17. *Zyzzarro hortorum*, thorax, dorsal view. 16, Male. 17, Female.

Description: Male (Fig. 14). Length: 2.8 mm; wing: 3.1 mm. *Head* (Fig. 2). Black; eyes narrowly dichoptic, separated at vertex by slightly less than distance between lateral ocelli; indentation on inner eye margin (Fig. 11) long (= width of 7–8 ommatidia); vertex and occiput shining black, with blackish brown hairs directly behind ocellar tubercle; frons shining creamy white above antennae, with scattered short yellowish hairs; face slightly produced at tip of oral margin, creamy yellowish with white hairs; antenna black; scape minute, pedicel subcylindrical, slightly wider than long; first flagellomere lanceolate, length about 3.5× greatest width; second flagellomere long, cylindrical, about equal in length to first flagellomere, with minute apical style; postgena gray pruinose with white hairs; proboscis black, length 1.5× head height; palpus not evident.

Thorax. Mesonotum strongly hunch-backed, matte black dorsally (Fig. 16), grayish pruinose anteriorly, laterally and on prescutellar area, with long whitish hairs; scutellum gray pruinose, dark brown posteriorly, brown stripe basomedially; pleura predominantly gray pruinose, otherwise all bare; meron black; halter stem yellow, knob yellow with dark brown dorsal spot.

Legs. Coxae black, with long white hairs; femora black basally, yellow on apical half; tibiae and basitarsi yellow, rest of tarsi black; femur and tibia with long with hairs with short yellowish white hairs. Pulvilli 3/4 length of claws.

Wing (Figs. 6,7). Hyaline; veins brown except Sc yellow; costa ends slightly beyond end of R_{4+5} ; vein Sc ending in wing margin at level of origin of vein R_{2+3} ; R_{2+3} shorter than last section of R_{4+5} , originating at midway point of R_s , ending in wing margin at level slightly beyond midpoint of R_{4+5} ; R_s sclerotized at connection with R_1 ; R_{4+5} slightly sinuous at wing margin; r-m crossvein placed at apical 1/3 of vein M_{1+2} ; vein M_1 and M_2 slightly curved to wing margin; cell dm open; anal cell very narrowly open at wing margin; CuP straight to wing margin, curved only at extreme apex; A_1 not sclerotized; anal

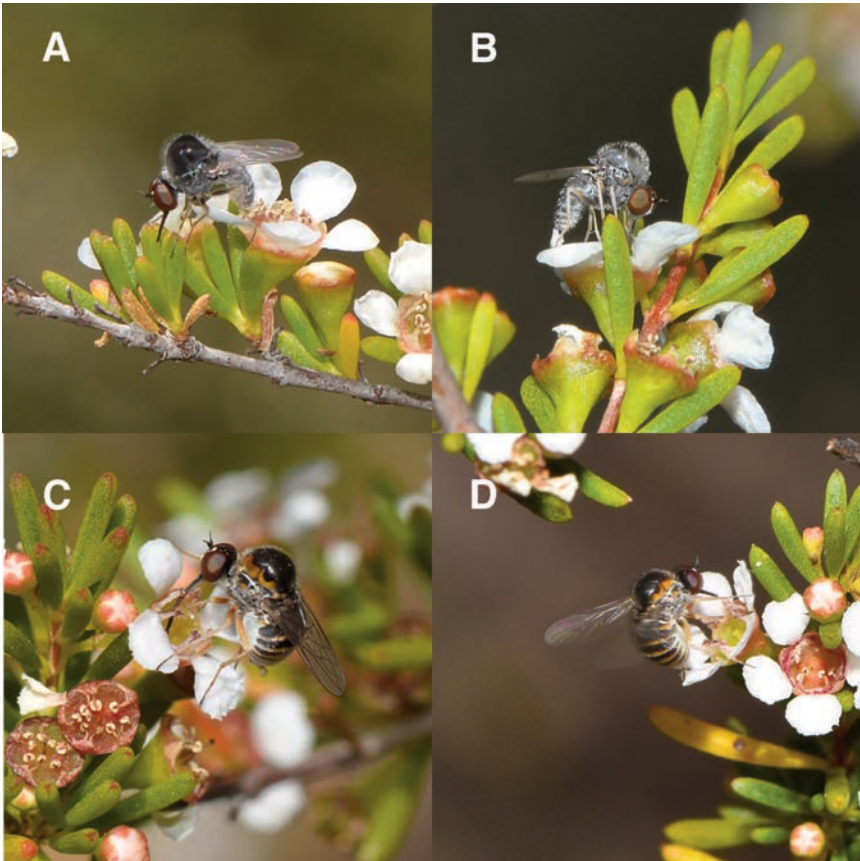


Figure 18. *Zyzzarro hortorum*, live photographs of fly visiting flowers of the myrtaceous *Astartea scoparia*. A–B, Male. C–D, Female.

lobe normal; alula absent; fringe of short hairs on posterior margin of wing. WIP (Fig. 7) with cyan to orangish and coppery coloration along posterior margin of wing; cell r2+3 magenta and greenish basally and anteriorly, dark bluish color apically and posteriorly; bluish at bases of cells r4+5, medial, Cup, and anal.

Abdomen. Dorsum black with thin white along posterior margin of tergites, with long decumbent white hairs; tergite I membranous on medial 1/4; venter brown.

Genitalia (Fig. 19). Epandrium subquadrate, slightly wider than high in lateral view, with pointed posteroventral process, cerci extremely small; gonocoxa in lateral view broad, rounded ventrally; gonostylus hook-shaped with broadly rounded base, tapering sharply to thin long hooked apical process; phallic complex with aedeagus trifid apically, enclosed in parameral sheath with long thin parameral apodemes, extending almost to level of aedeagal apodeme; lateral aedeagal apodemes wanting; aedeagal apodeme relatively small, anvil-shaped, extending below gonocoxae.

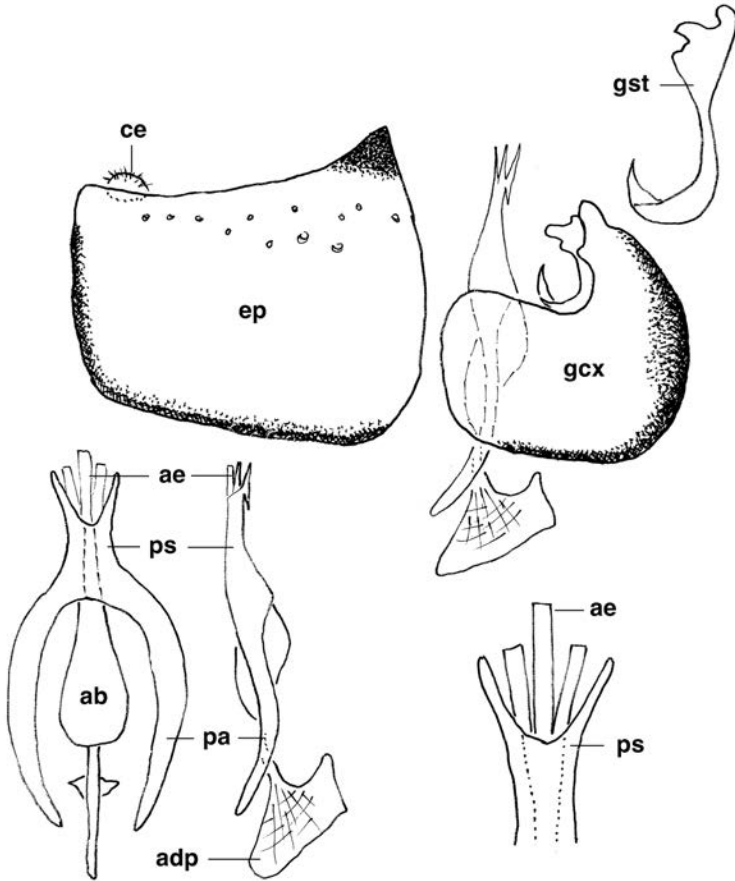


Figure 19. *Zyzzarro hortorum*, male genitalia. **A.** Lateral view. **B.** Phallic complex, lateral view. **C.** Phallic complex, dorsal view. **D.** Detail of gonostylus. **E.** Detail of parameral sheath apex showing trifid tip of aedeagus. Abbreviations: ab = aedeagal bulb; adp = aedeagal apodeme; ae = aedeagus; ce = cercus; ep = epandrium; gcx = gonocoxa; gst = gonostylus; pa = parameral apodeme; ps = parameral sheath.

Female. As for male except as follows. Frons as wide as width between lateral ocelli (Fig. 11); mesonotum shining black, not as hunch-backed as male (Fig. 17), yellow to yellow-orange anteriorly and laterally, lacking pruinosity; yellow on postalar callus extending as line to posterior margin of scutellum; scutellum black medially; pleura black and yellow patterned (Fig. 15); abdomen lacking pruinosity; tergite I black with yellow spot laterally; tergite II black with large yellow color laterally; tergites III–V black with larger amounts of yellow laterally; tergites VI–VII all yellow; venter predominantly yellow.

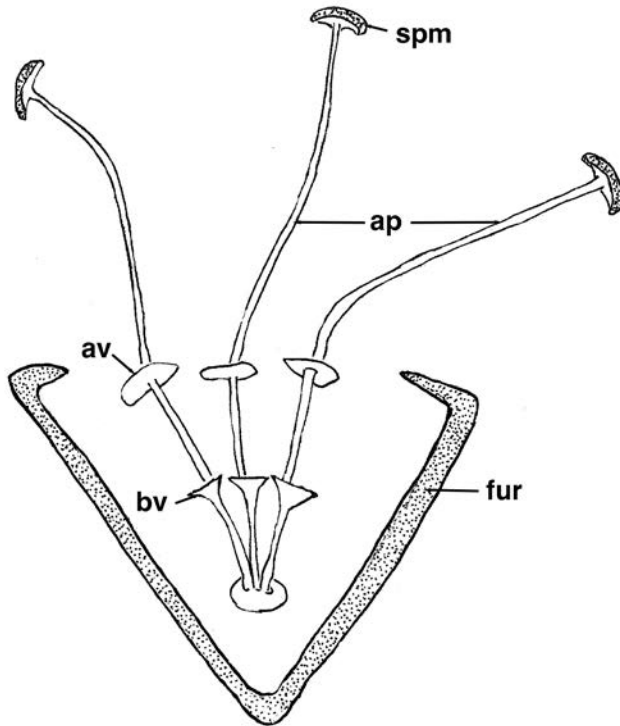


Figure 20. *Zyzzarro hortorum*, female genitalia. Abbreviations: ap = apical spermathecal duct; av = apical valve; bv = basal valve; fur = furca; spm = spermathecal reservoir.

Genitalia(Fig. 20) Furca V-shaped, thin; spermathecal reservoirs thin, mushroom-shaped; apical spermathecal duct thin, as long as lateral arm of furca; sperm pump with disc-shaped apical valve and funnel-shaped basal valve, length of sperm pump one-half that of apical spermathecal duct; basal spermathecal ducts short than sperm pump; common basal duct absent [genitalia lost after dissection and illustration; other female specimens were unfortunately glued to points so as not to allow access for dissection of abdomens].

Etymology. The specific name honors the photographers and discoverers of this new genus and species, Jean and Fred Hort, and in thanks for their continued enthusiasm for the flower visiting habits of mythicomyiid flies in Australia.

Remarks. Photographs of *Zyzzarro hortorum* (Fig. 18) show the flower visiting habits of this fly at the type locality on blossoms of *Astartea scoparia* Schauer, a xeric shrub of the family Myrtaceae endemic to Western Australia. Label data of specimens collected nearby show that males of this species swarm. Swarming behavior in mythicomyiids has only been recorded a few times in the literature but may be more common. The reason

may be that such behavior can take place at dusk, long after optimal collecting has ceased and collectors have left the area. Mühlenberg (1971) recorded this type of crepuscular swarming behavior on an undescribed species of *Cephalodromia* Becker in Greece and I have observed males of *Mythicomyia rileyi* swarm at dusk in the foothills of the Sierra Nevada in the Central Valley in California.

ACKNOWLEDGMENTS

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