

A NEW *PLATYCHEIRUS* FROM NEW ZEALAND
FIRST RECORD OF A MELANOSTOMINE
SYRPHID FLY ASSOCIATED WITH ANTS

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Summary

Platycheirus milleri n.sp. is described. It is the first known myrmecophilous melanostomine and the only New Zealand syrphid known to be myrmecophilous.

A new species of *Platycheirus* Lepeletier and Serville is described from New Zealand. This species is the first known myrmecophilous melanostomine fly as well as the only syrphid known to be associated with ants in New Zealand. Most myrmecophilous syrphids belong to the subfamily Microdontinae (Thompson, 1969) but the puparia of a syrphine species (*Xanthogramma pedissequum* (Harris)) and a chrysotoxine species (*Chrysotoxum verralli* Collin) have been found in nests of *Lasius niger* (Linne) in England (Dixon, 1960). Since none of the above-mentioned groups are known from New Zealand, it is not surprising to find a different syrphid genus occupying the ant-nest habitat in New Zealand.

***Platycheirus milleri* Thompson, n. sp.**

Head black except third antennal segment which is orange on ventral half, thorax mainly black, legs mostly orange and without any structural modifications or specialised setae, abdomen dull black with metallic bluish spots (males) or bands (females).

ADULT MALE

HEAD (Fig. 2): Face black, grey pollinose except shiny tip of tubercle, black pilose; cheeks black, grey pollinose and white pilose; frontal and vertical triangles black, grey pollinose and black pilose; occiput black, grey pollinose, with white pile below becoming yellower above with some black pile intermixed on upper half. Antennal pits narrowly separated. Antennae black except orange ventral half of third segment, one-third as long as face; third segment longer than basal two segments; arista about as long as antenna.

THORAX: Black except for orange spots above wing bases and at bases of postalar calli; dorsum shiny except lightly pollinose on sides in front of transverse suture, golden pilose except with broad black pilose band across dorsum above wings; pleura greyish pollinose except shiny middle of sternopleura, white pilose. Metasterna of normal *Platycheirus*-type, not reduced as in *Melanostoma* (Andersson, 1970). Scutellum black, shiny except dark pollinose on disc, golden pilose around edges, black pilose on disc. Plumulae white. Squamae white with fringe yellowish. Halteres yellowish orange. **LEGS:** with light coloured pile except dark pile on apical half of middle and hind femora and intermixed on posterior half of front and middle tibiae and anterior half of hind tibiae; coxae and trochanters shiny black; femora and tibiae orange with a slightly brownish cast on apical third; front and middle tarsi with basal two segments orange and apical three black; hind tarsi with all segments dark above. **WINGS:** hyaline, microtrichous except bare on anterior half of basal cells and basal third of anal cell; stigma luteous.

ABDOMEN: Dorsum dull black except for metallic bluish spots on second, third, fourth, and fifth terga and orange base of first tergum and lateral margin of fifth tergum, with abdominal spots as figured (Fig. 3a), white pilose on lateral margins, with lateral pile long on base of abdomen and shorter apically, short golden pilose on first tergum and most of second tergum except for narrow medial and apical band of black pile, short golden pilose on abdominal spots, short black pilose elsewhere. Venter long white pilose except short black pilose on apical half of fourth sternum; first sternum black and grey pollinose; second sternum shiny black; third and fourth sterna shiny orange. Hypopygium black, lightly pollinose and black pilose except golden pilose on cerci, with genitalia as figured (Fig. 1).

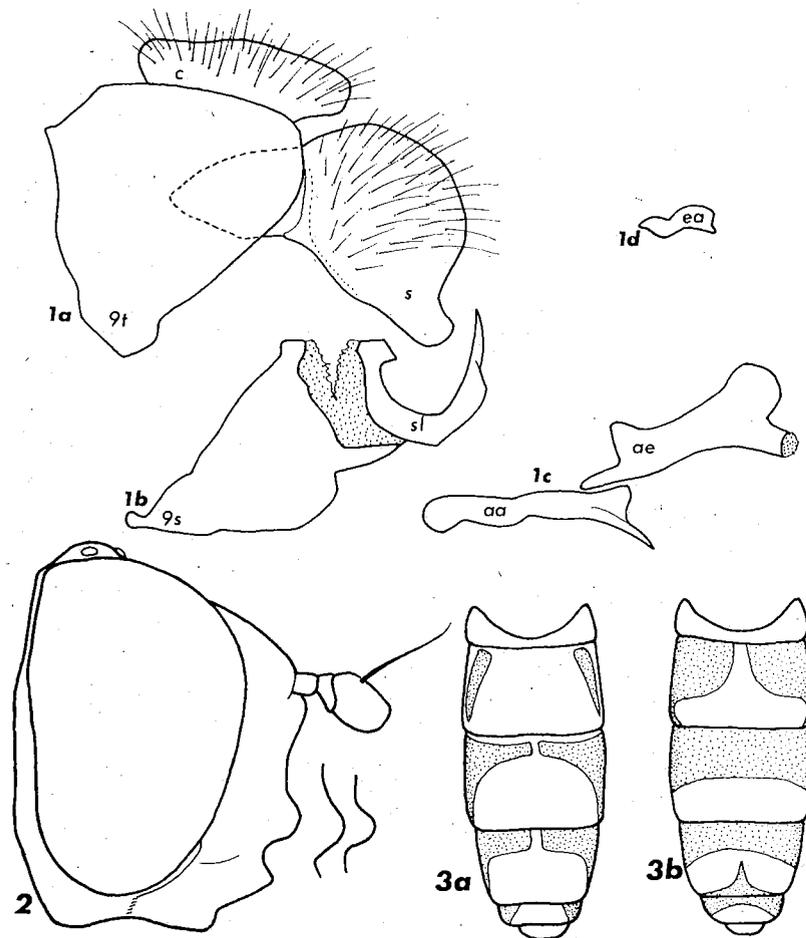
LENGTH: 12-13 mm, wings 9 mm.

ADULT FEMALE

Similar to male, differing only in the normal sexual characteristics and in the extent of the abdominal pattern (Fig. 3b).

ADULT VARIATION

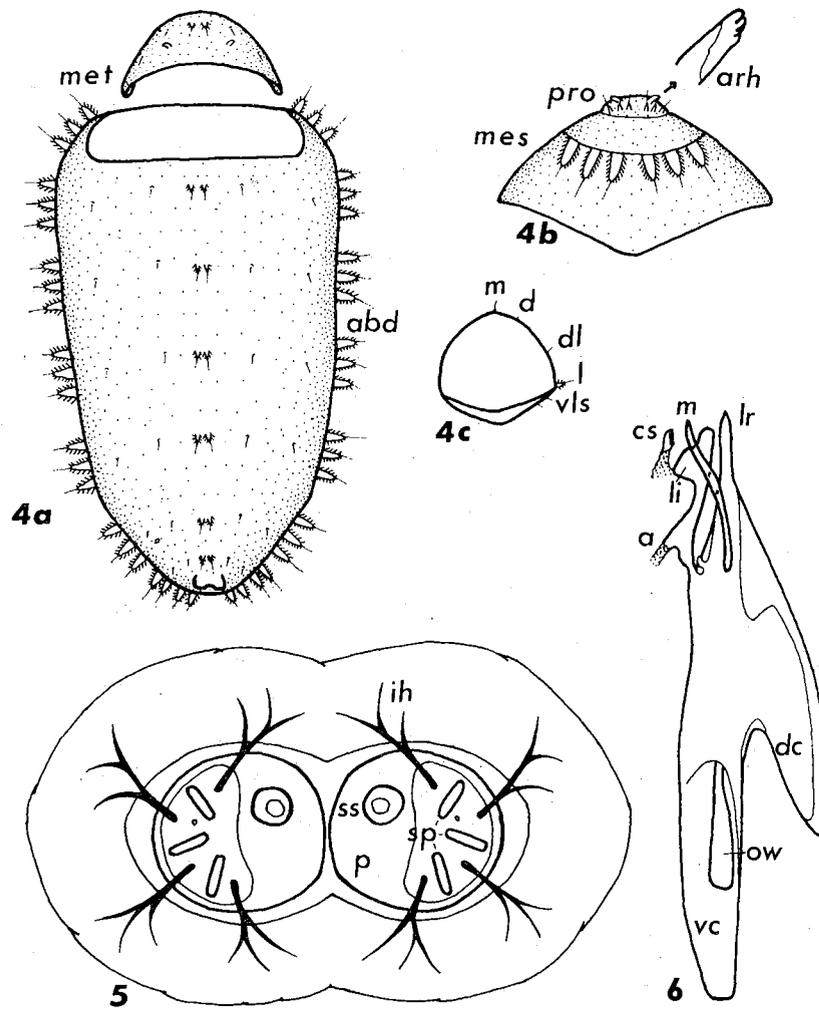
Among the series of 15 specimens examined the only appreciable variation noted was in: (1) abdominal pattern of the female, some specimens having the metallic bands separated into spots as in the male; (2) coloration of legs and third antennal segment, the extent of the darkened areas on the femora, tibiae, and third antennal segment being reduced in some specimens; and (3) shape of the facial tubercle, some specimens having the tubercle sloping gently while in others its slope is more abrupt.



FIGS 1-3—*Platycheirus milleri*. 1—Male genitalia, lateral view. (1a) 9t, 9th tergum; c, cercus; s, surstylus. (1b) 9s, 9th sternum; sl, superior lobe. (1c) ae, aedeagus; aa, aedeagal apodeme. (1d) ea, ejaculatory apodeme. $\times 86$.

2—Head of male, lateral view. $\times 22$.

3—Abdominal pattern, dorsal view, stippled areas are metallic bluish and white areas are dull black. (3a) male, (3b) female. $\times 8$.



FIGS 4-6—*Platycheirus milleri*. 4—Puparium, dorsal view. (4a) metathorax (met) and abdomen (abd) $\times 9$. (4b) prothorax (pro) and mesothorax (mes) with enlarged view of anterior respiratory horn (arh) $\times 17$. (4c) cross-sectional outline, d, dorsal hair; dl, dorsolateral hair; l, lateral hair; vls, ventrolateral hairs. $\times 5$.
 5—Spiracular plates, surface view: ih, interspiracular hair; p, spiracular plate; sp, spiracular slits; ss, spiracular scar. $\times 160$.
 6—Cephalopharyngeal skeleton, lateral view: a, apodeme for labial retractor muscle; cs, comb-like sclerite; dc, dorsal cornu; li, labium; lr, labrum; m, mandible; ow, outer wing of ventral cornu; vc, inner wing of ventral cornu. $\times 78$.

PUPARIUM (Fig. 4)

Length 8.0 mm, width 3.5 mm, height 3.0 mm, oblong oval in outline from above, hemispherical in cross section; segmentation indistinct; transverse wrinkles distinct only on anterior part of ventral sole, fine and equally spaced; longitudinal wrinkles and ridges absent; prolegs, claws, fleshy projections, and prominences absent; body surface papillose; two pairs of very small respiratory horns on anterior third and a single postero-dorsal respiratory process.

Segmental ornamentation consisting of typical syrphine pattern of six sets of segmental hairs: median hairs single, long, on large fringed papillae; dorsal and dorsolateral hairs single, greatly reduced, very short and not on papillae, equidistant between median and lateral hairs; lateral hairs triple, very long, on very large fringed papillae, forming a lateral border which separates top hemispherical part of puparium from flat ventral portion; anterior and posterior ventrolateral hairs single, short, on small conical papillae without fringe, set close together and at about two-thirds distance from midventral line to lateral hairs; segmental ornamentation reduced on both anterior and posterior ends of puparium.

Posterior respiratory process as long as broad, nodular, posterodorsal in position, strongly sclerotised; dorsal spurs absent; spiracular plates (Fig. 5) smooth and separated by a median groove; spiracular scars ("circular discs" of Dixon, 1960, and other syrphid workers) round, anterior and medial to inner ends of spiracle I and with diameter equal to length of a spiracle; small opening present between spiracles I and II; interspiracular hairs four per plate, branched, about twice as long as length of a spiracle; spiracles three per plate, short, elongate-oval, radiating outward and not situated on carinae; interspiracular ornamentation and spiracles situated on a pale kidney-shaped area differentiated from remainder of spiracular plate, this area extending equally to anterior, outer and posterior margins of spiracular plates.

Cephalopharyngeal skeleton as figured (Fig. 6), without apparent pharyngeal ridges.

LARVAL HABITAT

The larvae from which the type series was reared were collected from the nests of *Huberia striata* Smith (Formicidae). Mr J. I. Townsend of Entomology Division, Department of Scientific and Industrial Research, stated "that approximately one in twenty (*Huberia striata*) ant nests contained syrphid larvae and often more than one was found in a nest. Only one syrphid larva was found in the middle of a nest, all others were peripheral". (Townsend, pers. comm.) It is not known what these syrphid larvae eat in the ant nests; the nests containing larvae did not contain

any fulgoroids or coccids which have been reported as being "farmed" by *Huberia striata* (Moore, 1940).

MATERIAL EXAMINED

HOLOTYPE male: Canaan, Nelson, NEW ZEALAND; 20 October 1969 (emerged 12 November 1969), J. S. Dugdale and S. Edridge collectors. ALLOTYPE female: same data as holotype except emerged 23 November 1969. PARATYPES: 5 with same data as holotype except for the following emergence dates, 10 and 12 November (males), 13, 17, and 18 November 1969 (females); 1 male, Canaan, Takaka Hill, Nelson, NEW ZEALAND, 28 April 1961, J. I. Townsend collector; 2 males, Canaan, Takaka Hill, Nelson, NEW ZEALAND, 18 October 1962 (emerged November 1962), J. I. Townsend collector; 1 female, Cobb Ridge, Nelson, NEW ZEALAND, 3,500 ft, 24 October 1969 (emerged 24 November 1969), J. I. Townsend collector.

Other material examined: 1 male and 1 female, Harris, Ohakune, NEW ZEALAND; 1 female, Flora River, NEW ZEALAND, 16.i.22, A. Philpott collector; 1 female, Dun Mountain, NEW ZEALAND, 2,500 ft, 17.i.21, A. Philpott collector.

The holotype, allotype, and five paratypes are deposited in the collection of Entomology Division, Department of Scientific and Industrial Research (Nelson, New Zealand); one paratype each is deposited in the Canadian National Collection (Ottawa, Canada) and United States National Museum (Washington, D.C.); and the remaining two paratypes are retained in my collection.

DISCUSSION

Apparently *Platycheirus milleri* is not closely related to any described syrphid. *P. milleri* can be distinguished from all other New Zealand Syrphinae, including the three species placed by Miller (1921: 309-11) in *Platycheirus*, by its simple legs without any special modifications, pile or bristles, along with its dark face and black and bluish metallic abdominal pattern. In the latest keys to New Zealand syrphids (Miller, 1921: 293) *P. milleri* will run out to *Melanostoma apertum* Hutton. However, *Melanostoma apertum* can easily be separated from *P. milleri* by its long second antennal segment, immaculate abdomen, and ochreous tarsi.

The phylogenetic position of *P. milleri* deserves special note. The following characteristics clearly identify *milleri* as belonging to the tribe Melanostomini: (1) dark face and scutellum, (2) simple unsegmented aedeagus, (3) non-petiolate and unmarginated abdomen, and (4) bare metasterna.

The tribe Melanostomini can be divided into two groups of genera:

Melanostoma group and *Platycheirus* group. The *Melanostoma* group is characterised by: (i) triangular or quadrate, not sickle-shaped, superior lobes; (ii) elongate, usually not forked, styles (*Melanostoma lata* Curran, *M. concinnum* Snow, and *M. rufipes* Williston, Group 2 of Fluke (1957), have slightly forked styles); and (iii) simple legs in the male. The *Platycheirus* group is characterised by: (i) sickle-shaped superior lobes; (ii) forked styles; and (iii) modified protibiae in the male. The character states of the *Platycheirus* group are undoubtedly derived (apomorphic) and *Melanostoma* group states are primitive (plesiomorphic), since the *Melanostoma* group states are found in many other related syrphine genera, whereas the *Platycheirus* group states are unique. The *Melanostoma* group may be polyphyletic and/or paraphyletic, but the *Platycheirus* group is clearly monophyletic.

Based on Fluke's study of the male genitalia of the Melanostomini (Fluke, 1957), the following genera and groups belong to the *Melanostoma* group: *Melanostoma* Schiner, *Rhysops* Williston, *Xanthandrus* Verral, *Talahua* Fluke, *Tuberculanostoma* Fluke, and *Pyrophaena* Schiner (parte *granditarsus* Forester). The *Platycheirus* group is restricted to *Platycheirus* Lepelctier and Serville, *Carposcalis* Enderlein, and *Pyrophaena* Schiner (parte *rosarum* Fabricius).

The sickle-shaped superior lobes place *P. milleri* in the *Platycheirus* group, but the lack of modified protibiae and forked styles indicates that *milleri* forms a sister-group ancestral to the rest of the *Platycheirus* group. Thus *P. milleri* probably deserves generic recognition because of its phylogenetic position at the base of the *Platycheirus* stem. However, rather than adding to the existing tangle of generic groupings in the Melanostomini, I have placed *milleri* in *Platycheirus* temporarily until the entire tribe can be revised.

The puparium of *P. milleri* is entirely different in habitus from that of any other known syrphine group, but is rather similar in appearance to microdentine puparia. However, a number of larval similarities to the Syrphinae can be detected from it. *P. milleri* shares the following larval characters, as noted from the puparium, with the Syrphinae: (1) aphidophagous mouthparts, with internal mouth hooks; (2) prolegs and claws absent; (3) posterior respiratory process sessile, posterodorsal in position and entirely sclerotised; (4) posterior respiratory process with three elongate, radial and straight spiracles; and (5) posterior spiracular plate with an anterior, as opposed to a medial, spiracular scar. The following melanostomine characteristics have been noted in the posterior spiracular plate of *P. milleri*: (1) spiracles short, elongate-oval and not extending over the sides of the posterior respiratory process when viewed from above; (2) spiracles not situated on carinae; (3) spiracular plates separated by a

medial groove; and (4) spiracles and interspiracular setae situated on an area differentiated from the remainder of the spiracular plate. This last may not be a tribal character, but it has been described by Dixon (1960) for four species of *Platycheirus*, figured by Heiss (1938) for *Carposcalis obscurum* (Say), Dusek & Laska (1959) for *Melanostoma ambiguum* (Fallen), and Fluke (1929) for two other species of *Platycheirus*. The long, branched nature of the interspiracular hairs of *milleri* appears to be unique among the melanostomines.

Platycheirus milleri is named in honour of the pioneering New Zealand syrphid worker, Dr David Miller.

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