

# A new bee genus and species from south-western Australia (Hymenoptera: Colletidae, Neopasiphaeinae)

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**ABSTRACT** – *Mimocolletes apiculus* gen. nov. and sp. nov. is described from south-western Australia. Based on morphology, this bee's closest affinities are deemed to lie with the genus *Glossurocolletes* Michener. Like the two species of that genus, *M. apiculus* appears to be oligolectic on certain pea-flowered plants (mirbelioid Fabaceae) and exhibits some morphological adaptations in common with various other colletid bees that favour pea flowers. In particular, the proboscis is slender with a strongly compressed prementum and extended glossa.

**KEYWORDS:** taxonomy, oligolecty, Fabaceae, morphological adaptation

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## INTRODUCTION

The purpose of this paper is to make available a name for a singular species of hairy colletid bee known presently from a very limited area of south-western Australia.

The generic and family level systematics of Australia's hairy colletid bees (excluding the stenotritines – now in their own family) were well established through the monumental work of Michener (1965) in which all species were placed in the subfamily Colletinae and tribe Paracolletini. Michener retained this arrangement in his treatises of world bees (2000, 2007). Some generic-level changes were made by Maynard (1996, 1997, 2013). More recently, phylogenetic studies based on molecular data (Almeida and Danforth 2009), led to significant changes to the composition and naming of Michener's 'Paracolletini'. First, *Callomelitta* Smith was removed to a new subfamily, Callomelittinae (Almeida 2008). Second, *Paracolletes* Smith was shown to be more closely allied to the colletid subfamily Diphaglossinae than to the other taxa in the tribe. As *Paracolletes* is the type-genus, Almeida et al. (2012) resurrected the name Neopasiphaeinae Cockerell, 1930, for the bulk of the former 'Paracolletini' before Almeida et al. (2019) formally assigned *Paracolletes* to the Diphaglossinae.

I have been hesitant to create a new genus for a single species but the characters of the species in question do not permit it to be placed with certainty in any existing genus. The new taxon constitutes the third monospecific genus currently among the Australian neopasiphaeines, joining *Hesperocolletes* Michener and *Phenacolletes* Cockerell.

## METHODS AND MATERIALS

All specimens are lodged in the entomology collection of the Western Australian Museum, Perth (WAM).

Abbreviations for measurements: BL body length, BMW basal width of mandible, FL flagellum length, HL head length, HW head width, LFW lower face width, ML mandible length, MOW mid-ocellus width, MSL malar space length, OOD ocellular distance, SL scape length, SW scape width, UFW upper face width. The method of obtaining these measurements follows Houston (1975, Figs 8–9).

## SYSTEMATICS

### Family Colletidae

### Subfamily Neopasiphaeinae

### *Mimocolletes* Houston gen. nov.

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## DEFINITION

The bees constituting this new taxon are moderately small (body lengths c. 9.5–10.0 mm), andreniform (sensu Michener 2007) and, on casual observation, look much like many other native bees having a black head and mesosoma and an orange-brown metasoma (Figures 1–2). They exhibit a particular resemblance to certain other Australian Neopasiphaeinae in having

yellow-brown appendages (Figures 1–6). On closer examination, however, they are found to possess a unique combination of characters as detailed in the following diagnosis. *Mimocolletes apiculus* is the only known species.

#### DIAGNOSIS

Distinguished from other genera of Neopasiphaeinae with three submarginal cells in fore wing by the following combination of characters: Pterostigma well-developed, not parallel-sided, extending into marginal cell (Figure 7); labrum evenly, gently convex, lacking transverse ridges, tubercles or carinae, median length c. 0.34 x width in male, c. 0.36 x in female (Figures 5–6); hind basitibial plates well-defined in both sexes; inner hind tibial spur of female stout, uniformly tapering to curved apex, pectinate with c. 15 teeth, longest at mid series (Figure 8). Male with T6 strongly produced apically (Figures 9–10); gonocoxites terminating apically in membranous laminae (Figure 11) that protrude from apex of metasoma (Figure 10); S7 with one pair of slender, transverse, apical lobes (Figure 12); S8 with broad, bilobed apex (Figure 13).

Morphologically, *Mimocolletes* most closely resembles *Glossurocolletes*, a genus containing only two species, both from south-western Australia. Bees of both genera share a generally stocky form, a relatively small second submarginal cell in the forewing, a mostly vertical and smooth propodeal enclosure, sexually dimorphic tarsal claws (bifid in males, simple in females), the presence of pygidial plates in males and gonocoxites bearing complex, setose laminae apically. Perhaps coincidentally, species of both genera are pea-specialists.

*Mimocolletes* differs from *Glossurocolletes* in several respects enumerated in Table 1.

#### TYPE SPECIES

*Mimocolletes apiculus* sp. nov.

#### ETYMOLOGY

from Greek ‘mimos’ (= mimic; alluding to the many similarities to other genera) and *Colletes* (a genus name and common root in generic level names in Neopasiphaeinae). Masculine.

#### ***Mimocolletes apiculus* Houston sp. nov.**

Figures 1–18

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#### MATERIAL EXAMINED

##### *Holotype*

**Australia: Western Australia:** ♂, WAM E114851, Vermin Proof Fence, 4 km S of Great Eastern Highway, Koorarawalyee, 31°18'38"S, 120°00'34"E, 20 October 2012, TFH 1405-6, on flowers of *Gastrolobium semiteres*.

##### *Paratypes*

**Australia: Western Australia:** 2 ♀, 9 ♂, WAM E8261–E8271, 19 km ESE of Southern Cross, 31°17'38"S, 119°30'36"E, 28 October 1978, TFH 217-1, on flowers of *Gompholobium viscidulum*; 1 ♂, WAM E114852, same data as holotype.

TABLE 1 Differences between the genera *Mimocolletes* and *Glossurocolletes*.

| Character            | <i>Mimocolletes</i>                                              | <i>Glossurocolletes</i>                              |
|----------------------|------------------------------------------------------------------|------------------------------------------------------|
| Facial foveae        | Not evident                                                      | Weakly impressed                                     |
| Interantennal ridge  | Weak                                                             | Very strongly developed                              |
| Labrum               | Moderately long and evenly, gently convex in profile             | Short with strong transverse ridge basally           |
| Metasomal hair bands | Absent                                                           | Weakly developed in female                           |
| Male scape           | Slender                                                          | Thick                                                |
| Male flagellum       | Round in section and very slender                                | Dorsoventrally flattened and broad                   |
| Male S7              | Apodemes well-separated; apical lobes well-developed and slender | Apodemes broadly fused; apical lobes relatively tiny |
| Male S8, apically    | With very broad disc                                             | With pair of stalked laminae                         |

## DESCRIPTION

*Male (Holotype)*

Head width 2.9 mm; body length c. 9.5 mm. Relative dimensions: HW 100; HL 76; UFW 66; LFW 54; MOW 8; OOD 17; ML 40; BMW 13; MSL 0; SL 30; SW 7; FL 106.

Head wider than long, vertex slightly higher than ocelli (Figure 3); eyes converging ventrally; gena

c. 0.5 x as wide as compound eye viewed laterally; lower face rather straight in profile, clypeus gently convex transversely; supraclypeal area elevated, somewhat triangular, contiguous apically with weak median carina extending to middle of frons; malar areas obsolete; mandibles bidentate; upper margin of pronotum well below level of scutum, very thin and inconspicuous; proboscis with prementum strongly compressed, with a



FIGURES 1–6

*Mimocolletes apiculus* sp. nov. 1) male habitus; 2) female habitus, scales = 5 mm; 3) male facial view; 4) female facial view, scales = 1 mm; 5) male labrum; 6) female labrum.



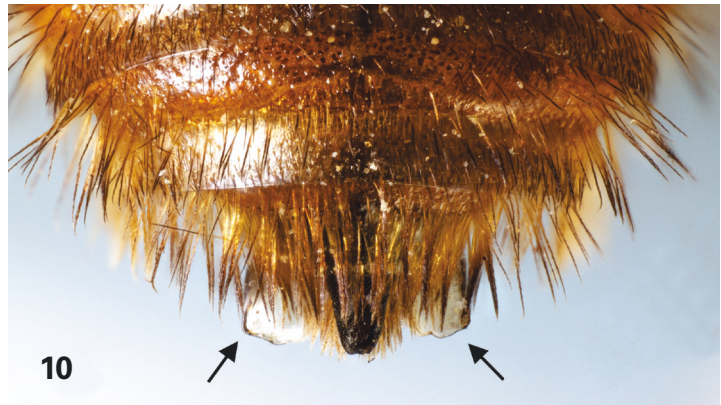
FIGURE 7 *Mimocolletes apiculus* sp. nov. wings of male (WAM E8262).



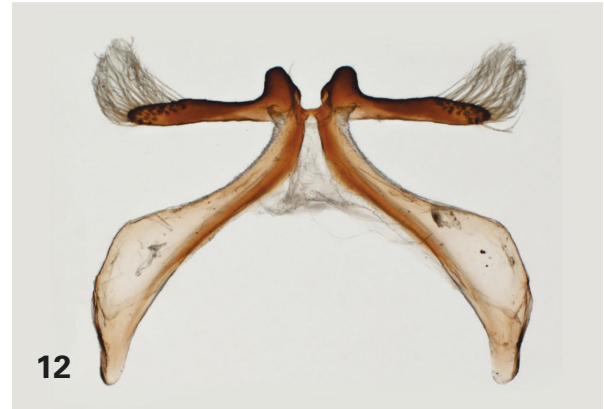
FIGURE 8 *Mimocolletes apiculus* sp. nov. inner hind tibial spur of female, scale = 0.1 mm.

median ridge posteriorly and glossa elongated (cf. female, Figure 17); antenna (Figure 14) with slender scape (length c. 4.3 x apical width) and flagellum slightly longer than head width, flagellomeres 4–10 c. 2 x longer than middle diameter, constricted basally and slightly less apically so that each has a gently convex ventral margin.

Metanotum unmodified. Propodeal enclosure with steeply sloping basal area scarcely differentiated from vertical posterior face. Legs rather short and stout; hind tibia with basitibial plate strongly defined, longer than wide and apically acute; hind basitarsus strongly compressed, nearly 1/3 as high as long; tarsal



FIGURES 9–10 *Mimocolletes apiculus* sp. nov., male: 9) apical (7th) metasomal tergum showing protuberant pygidial plate; 10) apex of metasoma in dorsal view showing protuberant, black, pygidial plate medially (on either side of the latter, indicated by arrows, are the apical laminae of the gonocoxites).



FIGURES 11–13 *Mimocolletes apiculus* sp. nov., male: 11) genital capsule, ventral view; 12–13) seventh and eighth metasomal sterna, respectively, in dorsal view. Scale = 0.5 mm.

claws (Figure 15) bifid, prongs subequal, closely approximated; arolia present. Metasomal T1 with abrupt anterior face rounding onto dorsal surface; T2 with no lateral foveae; T2–T5 with graduli strongly impressed with anterior margin of each gradulus developed into a thin, transparent, posteriorly directed lamina; hind margins of T1–T5 wide and transparent.

*Pubescence*: compound eyes with a few scattered, peg-like setae between the ommatidia; head and

mesosoma generally clothed in moderately dense, long, erect, plumose, straw-coloured setae; similar pubescence on bases of fore legs; mid and hind legs with shorter, sparser setae; metasomal terga with sparse, erect, simple, black setae; T6 and T7 with long, plumose, golden setae laterally; sterna with very short setae, lacking apical fringes.

*Colouration*: integument of head and mesothorax largely black; the following are yellow-brown: lower 1/3



FIGURE 14 *Mimocolletes apiculus* sp. nov., male, left antenna.



FIGURES 15–16 *Mimocolletes apiculus* sp. nov. apical views of distitarsi showing dimorphism of claws: 15) male; 16) female.



FIGURE 17 *Mimocolletes apiculus* sp. nov. posterior view of proboscis of female (gl, glossa; pm, prementum with median edge reflecting light; st, stipites).

of clypeus, grading to black above; labrum, mandibles (except for blackish apices) and scapes; the following are orange-brown: legs below trochanters, metasoma (except for black apex of T7). Antennal pedicel and flagellum dark brown; tegulae and wings veins light to dark brown.

**Sculpture:** clypeus laterally, ventrally and medially glossy, lacking pitting, but with a pair of pitted paramedian patches; integument of remainder of head, mesosoma and metasoma generally shining with small open pitting and minute pitting in the interspaces; propodeal enclosure smooth, glossy, lacking carinae.

**Terminalia:** See generic diagnosis and Figures 11–13.



FIGURE 18 *Mimocolletes apiculus* sp. nov. female, apex of femur and base of tibia of hind leg showing apically acute basitibial plate.

#### Female (WAM E8271)

Head width 3.3 mm, head length 2.5 mm; body length c. 9.9 mm. Relative dimensions: HW 100, HL 75, UFW 67, LFW 56, MOW 7, OOD 18, SL 30, SW 6.

For the most part similar in form to male, sharing with it a strongly compressed prementum and a slender, elongated glossa (Figure 17), but differing as follows: flagellum little more than half as long as head width, middle flagellomeres about as long as wide; upper margin of pronotum developed into a projecting angle each side; tarsal claws stout but simple (Figure 16); basitibial plate c. 0.3 x as long as hind tibia, acute at apex (Figure 18); pygidial plate small, flat, apically rounded.

**Pubescence:** as in male except as follows: setae on dorsum of mesosoma shorter, less dense in centre of scutum; scopa developed on hind coxae, trochanters, femora (except ventrally), tibiae and basitarsi, consisting of long, dense, highly branched golden-brown setae; metasomal sterna largely covered with long, erect, weakly plumose setae; prepygidial and pygidial fimbriae consisting of long, dense, plumose, gold-brown setae.

**Colouration:** as for male but clypeus largely black, only ventral margin somewhat brownish (Figures 4, 6).

**Sculpture:** Much as in male. Clypeus with close, fine pitting either side of midline, otherwise sparsely pitted and shining.

#### DISTRIBUTION

This species is recorded from only two localities 47 km apart and situated between Southern Cross and Coolgardie, Western Australia (Figure 19). One of the recorded forage plants, *Gompholobium viscidulum* Meisn., has a wide distribution in south-western Australia, extending from the Southern Cross region

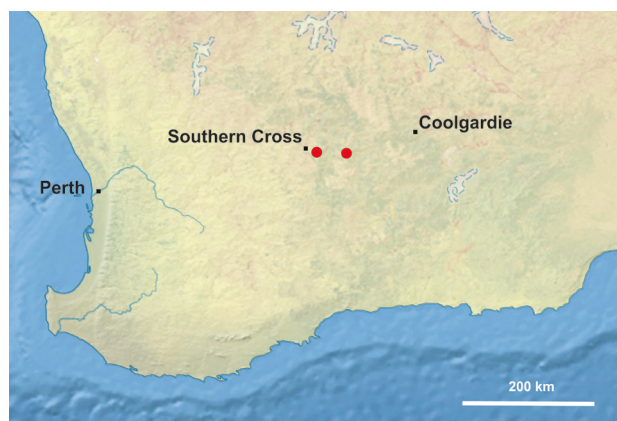


FIGURE 19 Collection localities of *Mimocolletes apiculus* (solid circles) in south-western Australia.

south to near Albany and east almost to Cape Arid (AVH 2024a). The other, *Gastrolobium semiteres* Chandler & Crisp, is known from far fewer localities, mainly in the Southern Cross — Boorabbin region, but is recorded also from c. 110 km south-east of the bee's known range (AVH 2024b). Potentially, the bee's actual geographic range could be much more extensive than currently known.

#### ETYMOLOGY

From Latin 'apiculus' (= extended to a point), alluding to attenuated apex of metasoma of male.

#### DISCUSSION

As reflected by its name, *Mimocolletes* shares numerous features with other Neopasiphaeinae. Like *Hesperocolletes* and *Trichocolletes*, it possesses a relatively large, evenly convex labrum which distinguishes it from *Leioproctus*. The narrow and strongly compressed prementum and stout inner hind tibial spur are shared with various other pea-flower specialists, such as *Glossurocolletes* and some *Trichocolletes* species, and may be adaptive. The slender, compressed prementum might facilitate insertion of the glossa between bundles of stamens to reach the nectary. Because only some species of *Trichocolletes* favouring pea-flowers exhibit this feature, it seems best not to treat it as a generic characteristic in *Mimocolletes*. Sexually dimorphic tarsal claws occur also in at least some species of *Leioproctus* (*Cladocerapis*) and *Trichocolletes*.

The orange-brown antennal scapes of both sexes and the yellow-brown clypeus of the male (less so the female) are seen in just some species of various other neopasiphaeinae genera such as *Anthoglossa*, *Chrysocolletes*, *Hesperocolletes*, *Leioproctus* and *Trichocolletes*. The male terminalia, however, are quite distinctive.

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