

Revision of the Australian bee subgenus *Leioproctus* (*Euryglossidia*) Cockerell, 1910 (Hymenoptera: Colletidae: Neopasiphaeinae)

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ABSTRACT. The subgenus *Leioproctus* (*Euryglossidia*) is a large group of Australian Neopasiphaeinae bees in need of revision. Forty-five new species are described, bringing the number of recognised names to 60. Four new synonymies are proposed, one species is transferred to *Leioproctus* (*Colletellus*) and one remains *species inquirenda*. No change is required in the diagnostic characters of the group, which is recognised by the presence of two submarginal cells in the forewing and a short jugal lobe on the hind wing. The new species demonstrate continuous character variation from rough to polished integument, iridescent to non-iridescent colour, sparse to close scopal hair of females without distinct breaks between subgroups. Detailed molecular investigation will be required before further subdivision is contemplated. Illustrations of diagnostic characters and identification keys are included.

Introduction

Australian bees included in the genus *Leioproctus* Smith, 1853 (Hymenoptera: Colletidae: Neopasiphaeinae) have long been recognised as a paraphyletic group (Michener, 2007; Almeida, 2008), though there have been different views about how the problem might be resolved (Almeida *et al.*, 2012; Maynard, 2013; Houston, 2018; Engel & Gonzalez, 2022). Michener (2007) was cautious about premature regrouping because he was aware that there are many undescribed species and many of the described species are known from only one sex. Proposals have been made for splitting the group into smaller genera based on molecular cladistics (Almeida *et al.*, 2012) or morphological novelties (Engel & Gonzalez, 2022), but new insights are expected to arise as species without obvious close relatives are still being discovered (Batley & Houston, 2023).

The name *Euryglossidia* was initially proposed for two colletid species with two rather than three submarginal cells

in the forewing. Michener (1965) added further species, reduced the group to a subgenus of *Leioproctus* and refined the definition by adding the additional character of a short jugal lobe on the hind wing to separate it from another subgenus, *L.* (*Colletellus*) Michener, 1965. Although Michener (1965) noted other features present in many species of *L.* (*Euryglossidia*), none was diagnostic. The subgenus *L.* (*Filiglossa*) shares the diagnostic characters of *L.* (*Euryglossidia*) but has, in addition, modified mouthparts with long hairs on the galea and filamentous labial palpi (Michener, 2007). More recently, Leijs *et al.* (2018) revised the subgenus *Colletellus* and added many additional species. The length of the jugal lobe of the hind wing was confirmed as a reliable character for subgeneric diagnosis of *Colletellus*. The aims of this revision were to provide names for a large number of undescribed *Euryglossidia* species and clarify morphological variation within the group, which could guide the choice of targets for future molecular study.

Keywords: Taxonomy, new species, new synonymies, new status

ZooBank registration: urn:lsid:zoobank.org:pub:8F8E40AF-ACB0-4FD5-9870-479D5E46DF1B

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Submitted: 7 November 2024 **Accepted:** 23 January 2025 **Published:** 12 March 2025 (in print and online simultaneously)

Publisher: The Australian Museum, Sydney, Australia (a statutory authority of, and principally funded by, the NSW State Government)

Citation: Batley, M. 2025. Revision of the Australian bee subgenus *Leioproctus* (*Euryglossidia*) Cockerell, 1910 (Hymenoptera: Colletidae: Neopasiphaeinae). *Records of the Australian Museum* 77(1): 1–88. <https://doi.org/10.3853/j.2201-4349.77.2025.1908>

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Methods and terminology

Binocular microscopes with an eyepiece scale or graticule were used for examining and measuring specimens. A Leica stereomicroscope with image stacking software was used to obtain high-resolution images of all species. Male terminalia were extracted and muscle tissue removed using standard chemical treatment (Michener, 1965). Images of the clarified terminalia were obtained using either the Leica equipment or a Wild M11 compound microscope with images processed by Helicon Focus v8.

The morphological terminology employed here is largely that of Michener (2007), including reference to legs in their normal position, use of the term propodeal triangle rather than metapostnotum and interchangeable use of the terms seta and hair. Where available, the collection unique identifiers for specimens are recorded, but some specimens did not have such identifiers.

Integumental sculpture. The most common type of integumental sculpture is a reticulate pattern of narrow raised lines on a flat or gently curved surface which will be called pit-reticulation. Figure 1A shows a typical pit-reticulate pattern, but also demonstrates how illumination can affect its appearance. Some areas in the upper image appear to have depressed lines rather than raised lines, but when the surface is tilted, as in the lower image, it can be seen that they are in fact raised. In most cases the ‘term pit-reticulation’ will be shortened to ‘reticulation’. It is a generalisation of the term defined by Houston (1975) and the usage is the same as that in Leijts *et al.* (2018). Similar sculpture has been called ‘imbricate’ (e.g. Harris, 1979, figs 39–41) but pit-reticulation does not have the appearance of overlapping surfaces implied by that term.

The metasomal terga of many *Euryglossidia* species are reticulate but the pattern is transversely stretched. This distorted pattern is called lineo-reticulation following Houston (1975). When the distortion is extreme the resulting appearance is silky (Fig. 1B) and is described as satin lineo-reticulation. A different net-like pattern found on the frons of some species, is produced by strong, almost contiguous punctures (Fig. 47B). This, much coarser, pattern is described as areolate. Surface pitting is a common feature and its density is expressed in terms of the width of interspaces between punctures, *i.*, as a multiple of puncture diameter, *d.*

Consistent description of surface sculpture required careful attention to the uniformity of illumination. Non-uniform lighting can alter the apparent relative strength of rugae, reticulation and punctures, which can be important in cases of intraspecific variation.

Setae. The terms seta and hair are used interchangeably (Michener, 2007). The setae that comprise the hind tibial scopa of females, while broadly similar in many species, are occasionally of diagnostic value. Hair on the anterior margin of the tibial scopa is usually bipectinate (Fig. 1C), while that in the middle and on the posterior margin is typically pectinate (Fig. 1D). The latter has been used for other bees (Hines *et al.* 2022) and is equivalent to the term “monopodally branched” used by Maynard (2013, p 8 *et seq.*). In a few species the bipectinate hair on the anterior margin has distinctly crinkled tips which can be diagnostic (Fig. 1E). Hind femora also have mostly bipectinate pollen-carrying hairs and female metasomal sterna typically have rows of pectinate hair.

Elsewhere, mostly on the head and mesosoma, the hairs have branches around the shaft and is called plumose (Hines *et al.*, 2022). No attempt is made to subdivide different distributions around the shaft except to mention where the hair is flattened. Instead branching, which is usually short, is categorised as tightly, openly or sparsely distributed along the shaft. The length of setae is given relative to the median ocellar diameter (MOD).

Iridescent colours. In roughly forty percent of species the integument is to some extent iridescent. In most cases this is best described as a brassy sheen, but in others is blue or bluish-green. The brightness of the colour, however, depends on roughness of the surface and the condition of the specimen so that it can be difficult to detect without direct comparison with an area confidently believed to be non-iridescent (Fig. 1F). To avoid cumbersome descriptions and keys, reference to a brassy sheen is made only where it is believed that its presence will be clear in specimens in good condition with the general caveat that absence of the character may be the result of specimen age or condition.

Claws. There is a variation in the size and location of the inner ramus on the claws of females (Michener, 1965). Terms like medial tooth or subapical tooth are rather subjective and no attempt has been made to formalise the descriptions for cases other than simple claws (Fig. 24B) or large truncate inner claws (Figs 3B, 45B).

Spurs. The inner hind tibial spur of females can be a useful diagnostic feature with both the number and length of teeth varying between species (Fig. 1G–J). Michener (1965) suggested that *L. striatulus* differed from the majority of species in *L. (Euryglossidia)* in having a spur that he described as ciliate, a term he also used to describe the spur of *Leioproctus (Leioproctus) imitatus* Smith, 1853, which is the type species of the genus *Leioproctus*. The range of variation found in this study was continuous and in no case were the teeth as fine as in *L. imitatus* (Fig. 1J). For this reason it is more informative to describe the shape of the hind tibial spur as the number and length of the teeth compared to spur width, rather than using the terms pectinate or ciliate.

Collection data. Information from specimen labels is reported in standardised form rather than verbatim, in particular for dates. Where a label does not record a GPS value, a value was calculated using Google Earth Pro and if the location is imprecisely defined, the number of significant figures was reduced to indicate the estimated uncertainty. Similarly, where data for several specimens collected at adjacent sites is amalgamated, an average GPS value with reduced precision is recorded. The names of states and territories in which specimens were collected are indicated by the following abbreviations: ACT Australian Capital Territory; NSW New South Wales; QLD Queensland; SA South Australia; VIC Victoria; WA Western Australia and the following acronyms are used for the repositories for the specimens examined: AMS Australian Museum (Sydney, NSW); ANIC Australian National Insect Collection, CSIRO (Canberra, ACT); NHM Natural History Museum, London, UK; SAM South Australian Museum (Adelaide, SA); WAM Western Australian Museum (Perth, WA); YUC Laurence Packer bee collection at York University (Toronto, Canada).

Abbreviations. Head measurements relative to a head width of 100 are abbreviated as follows: CL clypeus length; FL flagellum length; HL head length; HW head width; LFW lower face width; SL scape length; SW scape width; UFW



Figure 1. A, pit-reticulation on propodeal triangle of ♀ *L. latipes*. Upper image: viewed perpendicularly to surface. Lower image: left hand side of specimen raised by 15°. B, satiny lineo-reticulation on metasomal T2 of *L. sericeus*. C, D, hind tibial scopal hair of ♀ *L. cristativentris*: C, bipectinate, D, pectinate. E, hind tibial scopa of ♀ *L. simillimus* showing crinkled tips on the anterior (left) margin. F, metallic blue mesepisternum of ♀ *L. cristativentris*. G–J, inner hind tibial spur of females: G, *L. vitrifrons*, H, *L. diloris*, I, *L. striatulus*, J, *L. imitatus*.

upper face width (maximum width of face above antennae). Metasomal terga are referred to as T1, T2 etc. and sterna as S1, S2 etc.

Association of sexes. Unless otherwise specified, the sexes of a species were associated by morphological similarity and coincident collection.

Results and discussion

A total of 60 species were recognised as belonging in *Leioproctus* (*Euryglossidia*), one published name remains *species inquirenda* and another is transferred to *Leioproctus* (*Colletellus*). Forty-five new taxa are described and four new synonymies are proposed: *L. cyanescens* (Cockerell, 1929) = *L. cygnellus* (Cockerell, 1905); *L. eraduensis* (Cockerell,

1929) = *L. vitrifrons* (Smith, 1879); *L. ichneumonoides* (Cockerell, 1906) = *L. simillimus* (Smith, 1879); and *L. rectangulatus* (Cockerell, 1910) = *L. australiensis* (Dalla Tore, 1896). Syntypes of *L. singularis* (Rayment, 1935) could not be found, and none of the specimens examined agreed with the original descriptions, so this name is at the present time *species inquirenda*. *L. rejectus* (Cockerell, 1905) is transferred to *L. (Colletellus)*.

All species have a forewing with two submarginal cells and a first recurrent vein distal to or, rarely, meeting the first submarginal crossvein, a hind wing with a short jugal lobe not reaching cu-v and a defined propodeal triangle with a moderately long subhorizontal area curving smoothly onto a vertical posterior surface. Other characteristics are common but not diagnostic. Consequently, subgeneric identification requires no modification of Michener's key to the subgenera

of *Leioproctus* of the Australian region (Michener, 2007).

One common characteristic is finely reticulate surface sculpture. Of the 57 known females, 41 have a mesoscutum that is reticulate and dull, in one it is coarsely and densely punctate, in 11 the interspaces between punctures are polished with at most weak reticulation and in one the reticulate pattern is irregular and variable. Of the 44 known males, 36 have a dull reticulate mesoscutum. Reticulation is usually noticeably stronger in males than in females of the same species. The propodeal triangle is at least partially reticulate in all species, although obscured by rugae in two, and is usually coarser than reticulation elsewhere on the body.

Iridescence is present in a little over 1/3 of species, though as mentioned above, often difficult to see in preserved specimens. The most common occurrence is a brassy sheen on the frons, scutum and metasoma or any combination of them. More rarely paraocular areas on the head and the propodeal triangle may be brassy. Blue or blue-green colours are less common and females of one species can have the metasoma entirely steel blue.

The hair of the female hind tibial scopa is usually sparse with only 11 species having a scopa with close hairs. This feature may be related to size of the pollen most frequently collected (Houston, 1981). *Leioproctus cygnellus* is the only species without branched hairs on the hind tibia.

No subdivision of *Euryglossidia* is proposed at this stage. Characteristics like surface sculpture on the scutum, density of scopal hair or iridescent colouration vary almost continuously between, and occasionally within, species. The scutal punctures of *cygnellus* are only slightly denser than those of *L. halictiformis* or *L. brunneipilosus*, and *L. bracteatus* and *L. rubiginosus* are intermediate in a range of densities to the sparse punctures of *L. brochus* and *L. striatulus*. The interspaces between punctures on the scutum are frequently dulled by strong reticulation, but in species like *L. acaciae* it is less strong so that punctures are clearly visible and the surface is weakly shiny. In females of some species like *L. nigrescens* and *L. sericeus*, the strength of the reticulation varies across the scutum and is noticeably weaker medially, while in 11 of the 57 known females reticulation is absent and the scutum is polished between punctures. In one species, *L. mutabilis*, the reticulate pattern is blurred and distorted, disappearing from random areas that vary between individuals. Although *L. cygnellus* remains the only species in which the female is believed to transport pollen in the crop, females of species like *L. australiensis*, *L. baeckea* and *L. purpurascens* have hind tibial scopae with sparse hair and little branching of the hairs. Females of other species have hind tibial scopae exhibiting a continuous range of density and branching to the close hair of *L. euscopatus*, but no species has the dense scopae found in some species of *L. (Goniocolletes)* (Cockerell, 1907).

Iridescent colours occur frequently throughout the group, but with one exception, are not correlated with other characteristics. The exception is what might be called the *vitrifrons* species group consisting of *L. calvus*; *L. chrysopsis*; *L. clivifrons*; *L. criniventris*; *L. cristativentris*; *L. heterodoxus*; *L. korungensis*; *L. macalpinei*; *L. mungoensis* and *L. vitrifrons*. Males have depressed ocellular areas, female mesepisterna are weakly iridescent blue and their inner hind tibial spurs have 3–4 long teeth. The male terminalia of this group are varied and many differ considerably from those of the majority of *Euryglossidia*

species. Three species, *L. heterodoxus*, *L. macalpinei* and *L. mungoensis*, however, approach the main group of species with respect to body length, terminalia and general appearance to the extent that both Houston (1974) and Michener (2007) considered that *L. heterodoxus* did not differ from other *Euryglossidia*, apart from the modified hind legs of the male. The name *Notocolletes* Cockerell, 1916 is available to anyone wishing to distinguish the group as a genus or subgenus, but until there is evidence that it is a convergent sister group rather than a stem group, use of the name is inadvisable.

Collection sites covered the range from 25.5°S to the south coast of the mainland and from east to west coast. No specimens were located in Tasmania. Collection dates were predominantly between August and October.

Generalisations about floral preferences are limited by the number of distinct collection events. In a few cases, large numbers of specimens were collected from a single plant species, possibly indicating abundant flowering rather than strong preference by the bees. As has been observed previously (Houston, 1981), *L. (Euryglossidia)* species are frequently found on *Grevillea* and *Hakea* and 24 of the species in this study were collected at least once from these flowers. For only 17 of the species, however, was there a floral record for more than one collection event and 10 of those were from more than one plant family. This suggests that while a number of species readily forage from *Grevillea* and *Hakea*, they may not have a strong preference for them. The one exception may be *L. rostratus* which has a most unusual clypeus and has been found only on two *Hakea* species with tightly packed cylindrical racemes known commonly as “red pokers”.

Systematics

Order Hymenoptera Linnaeus, 1758

Superfamily Apoidea Latreille, 1802

Family Colletidae Lepeletier, 1841

Subfamily Neopasiphaeinae Cockerell, 1930

Genus *Leioproctus* Smith, 1853

Subgenus *Leioproctus (Euryglossidia)*

Cockerell, 1910

Euryglossidia Cockerell, 1910: 358.

Leioproctus (Euryglossidia)—Michener, 1965.

Notocolletes Cockerell, 1916: 44.

Paracolletes (Lysicolletes) Rayment, 1935: 208.

Euryglossidia (Manocolletes) Engel in Engel & Gonzalez, 2022: 32. **new synonymy**

Euryglossidia (Cygnella) Engel in Engel & Gonzalez, 2022: 32. **new synonymy**

Euryglossidia (Notinopasiphae) Engel in Engel & Gonzalez, 2022: 34. **new synonymy**

Type species. *Euryglossidia rectangulata* Cockerell, 1910: 359 (original designation).

Diagnosis. The subgenus as currently understood, contains bees 4 to 11 mm long having the appearance of *Leioproctus* proper with two submarginal cells in the forewing, the jugal lobe of the hind wing not reaching cu-v, a clearly defined propodeal triangle with a moderately long subhorizontal area curving onto a vertical posterior surface and without the long galeal hairs and filamentous labial palpi of the subgenus *L. (Filiglossa)*. No other characteristic is diagnostic but most species are immediately recognisable.

Description. The subgenus consists of usually slender species 4 to 11 mm long, head and mesosoma usually black, sometimes with a brassy sheen or weakly iridescent green or blue, metasoma black, iridescent, red or a combination red, brown, yellow, and black. In many species the integument is reticulate and dull, though in others it is weaker. The scutum is not reticulate in females of 11 species and males of 6 species, but the propodeal triangle is reticulate in all but two species. Facial fovea are absent but females may have polished areas or areas of weakened sculpture where such fovea might be expected.

Wings can be hyaline or brown tinted, but the jugal lobe of the hind wing is always short and never reaches cu-v. The first recurrent vein of the forewing always enters the second submarginal or rarely may be interstitial with the first submarginal cross vein. The length of first abscissa of posterior vein of second submarginal cell is occasionally of diagnostic value but varies sufficiently within species that it must be used cautiously.

The inner hind tibial spur of the female is pectinate with the length of the teeth ranging from twice the width of the shaft to less than half that width. The long horizontal surface of the propodeum is usually reticulate and curves smoothly onto the vertical surface. The hidden sterna and genitalia of the male are useful diagnostically with S7 usually having four posterior lobes. Claws of female usually with a moderate or small inner ramus but a few species have simple claws and two have a large, blunt basal tooth.

Identification keys to the Australian bee subgenus

Leioproctus (*Euryglossidia*)

Members of the subgenus share the following characters:

- i. glossa short, bilobed;
- ii. basal vein of forewing weakly arcuate;
- iii. fore wing with two submarginal cells;
- iv. first recurrent vein of fore wing distal to or meeting the first submarginal crossvein;
- v. hind wing with jugal lobe not reaching vein cu-v;
- vi. propodeum with a subhorizontal basal area, longer than the metanotum, curving onto the vertical posterior surface;
- vii. metasomal T6 with prepygidial fimbria;
- viii. galea without long apical hairs, palpi not elongated.

Females

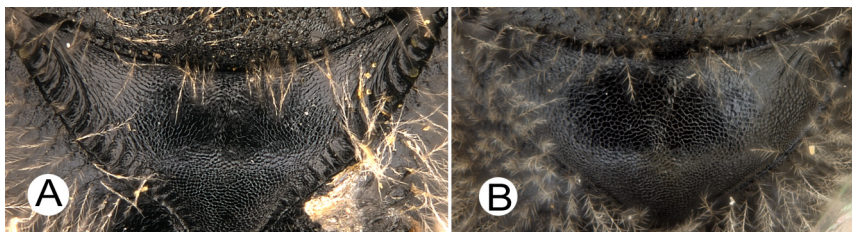
- 1. Mesosoma laterally iridescent blue (A); body length >7 mm; scutum dull, strongly reticulate (B); wings with brownish tint (C) 2
- Without the above combination of characters 9



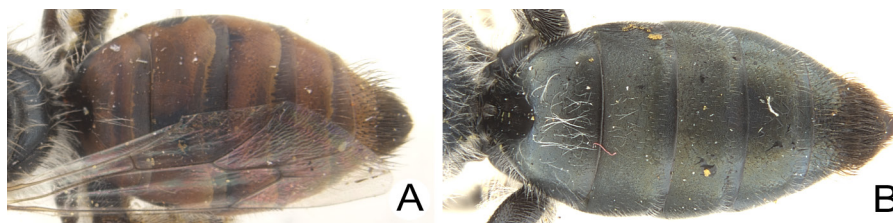
- 2(1) Tibiae and tarsi dark orange-brown (A) 3
- Tibiae and tarsi dark brown or black (B) 4



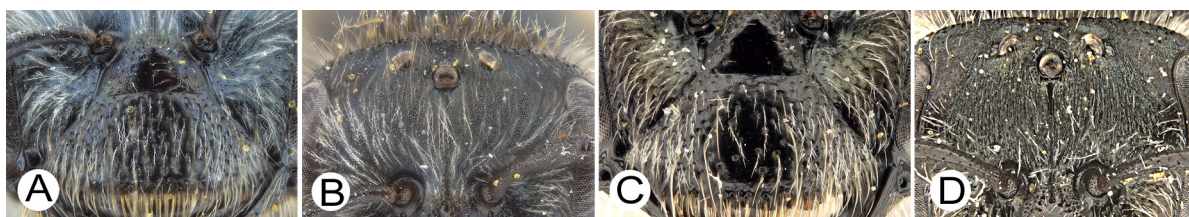
- 3(2) Propodeal triangle with long scrobiculate peripheral sulcus (A); frons distinctly punctate *cristativentris*, *criniventris*
- Propodeal triangle without long scrobiculate peripheral sulcus (B); frons indistinctly punctate *korungensis* sp. nov.



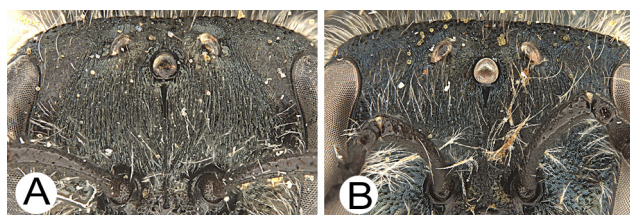
- 4(2) Prepygidial fimbria light brown or orange 5
- Prepygidial fimbria dark brown or black 6
- 5(4) Scutum with close long hair, 1–2×MOD; propodeal triangle with basolateral longitudinal rugae *mungoensis* sp. nov.
- Scutum with short hair, 0.5–1×MOD; propodeal triangle without rugae *heterodoxus*
- 6(4) Metasoma banded red-brown and dark brown (A) *clivifrons* sp. nov.
- Metasoma bronze or black often with brassy sheen (B) 7



- 7(6) Clypeus with dense, mid-sized punctures medially (A); frons not striate (B) *macalpinei* sp. nov.
- Clypeus with large, irregularly spaced punctures medially (C); frons striate (D) 8

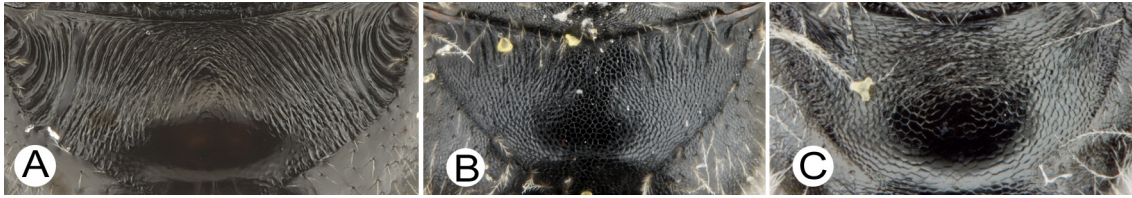


- 8(7) Frons strongly striate (A); body length about 9 mm *vitrifrons*
- Frons weakly and irregularly striate (B); body length >10 mm *chrysopsis* sp. nov.

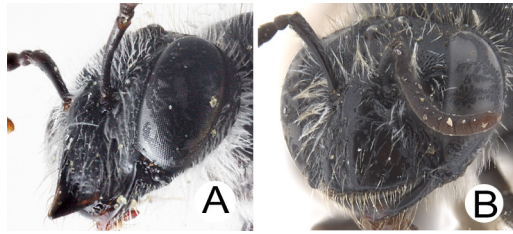


- 9(1) Metasoma at least partly red-, orange- or yellow-brown 10
- Metasoma dark brown, black or iridescent 25

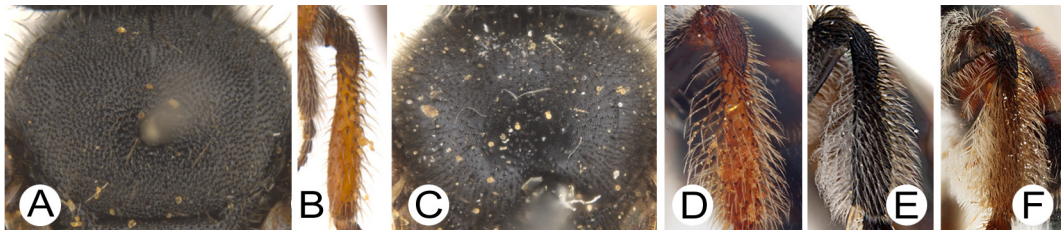
- 10(9) Propodeal triangle with longitudinal rugae (A), sometimes only basally (B) 11
 — Propodeal triangle without longitudinal rugae (C) 14



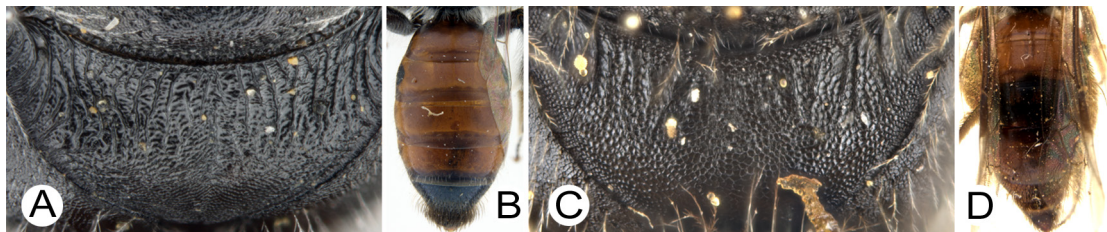
- 11(10) Clypeus with longitudinal carina and upturned apex (A) *rostratus* sp. nov.
 — Clypeus smoothly convex (B) 12



- 12(11) Scutum with strong, mid-sized punctures, $i < 0.5d$ (A); hind tibial scopa almost obsolete, setae unbranched (B) *cygnellus*
 — Scutum reticulate, dull with weak, small punctures, $i > 0.5d$ (C); hair of hind tibial scopa at least weakly branched, sparse (D), open (E) or close (F) 13

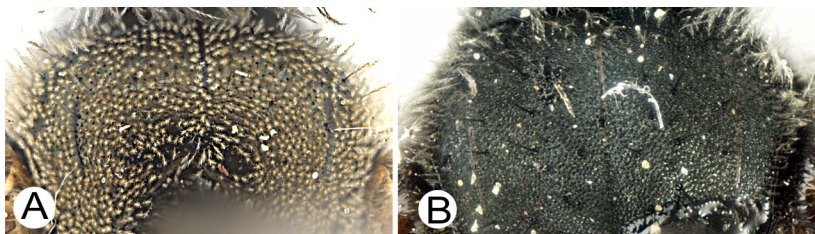


- 13(12) Legs all black; propodeal triangle with rugae to end of horizontal area (A); metasomal T1–T4 orange-brown, T5, T6 black with bluish sheen (B) *simillimus* (part)
 — At least fore tibia partly yellow brown; propodeal triangle with basal rugae only (C); metasomal terga usually mottled yellow- or orange-brown (D) *acaciae*



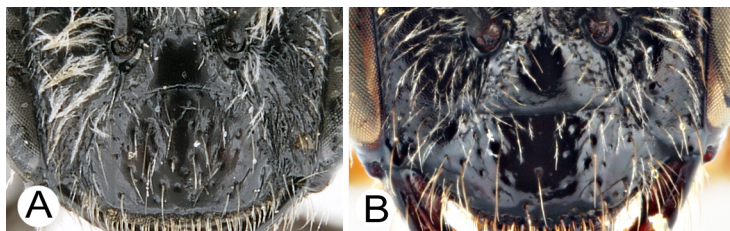
- 14(10) Frons vertically striate 15
 — Frons without vertical striae 19

- 15(14) Scutum with dense pale tomentum (A) *rubiginosus*
 — Scutum without dense pale tomentum (B) 16

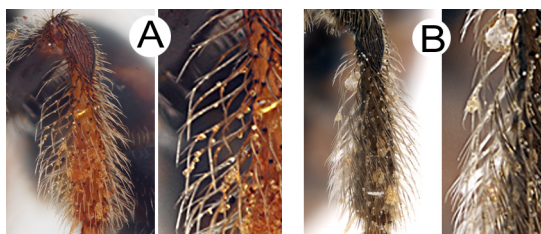


- 16(15) Small, length <7 mm; clypeus densely punctate, $i < 0.5d$; frons brassy *viridescens*
 — Mid-sized, length 7–8 mm; clypeus sparsely or openly punctate, sometimes unevenly distributed; frons black 17

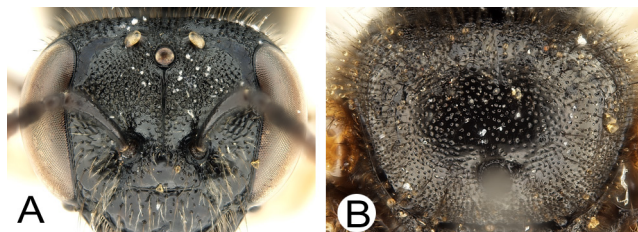
- 17(16) Clypeus and supraclypeal area strongly convex and prominent; apex of supraclypeal area broad with medial depression (A); clypeal punctures variable in size and distribution, frequently coalescing (A) *mastersi*
 — Clypeus and supraclypeal area less strongly convex; anterior face of supraclypeal area approximately triangular with a narrow rounded apex (B); clypeal punctures variable in size and distribution, but not coalescing 18



- 18(17) Hind tibial scopa sparse; scopal hair weakly branched (A) *australiensis*
 — Hind tibial scopa open; scopal hair on anterior margin well branched (B) *diloris* sp. nov.



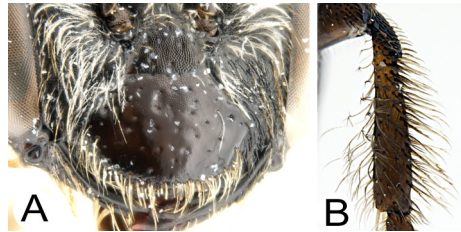
- 19(14) Clypeus with large, dense, irregular punctures and an apicomedial projection (Fig. 49B) *pustulatus* sp. nov.
 — Clypeus with well-defined punctures and with no apical projection 20
 20(19) Frons areolate (A), scutum polished (B) *punctatifrons* sp. nov.
 — Frons scabrous, scutum reticulate 21



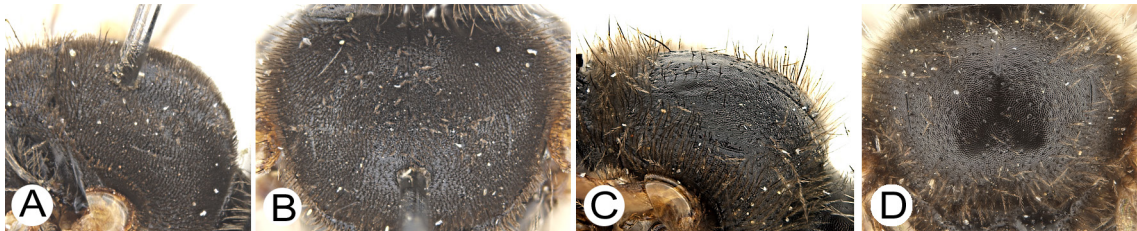
- 21(20) Clypeal punctures dense, $i < d$ 22
 — Clypeal punctures mostly open, $i > d$ 23
- 22(21) Hind tibial scopal hair sparse, simple along posterior margin (A); face and scutum sometimes brassy *baeckeeae*
 — Hind tibial scopal hair close, strongly branched on posterior margin (B); face and scutum black *euscopatus* sp. nov.



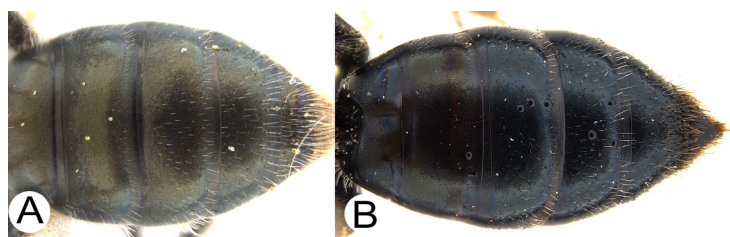
- 23(21) Clypeus relatively flat, only gently convex (A); hair of hind tibial scopa sparse, weakly branched (B) *purpurascens*
 — Clypeus moderately convex; hair of hind tibial scopa close, well branched 24



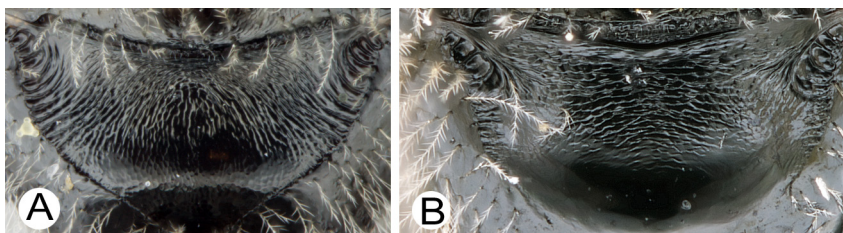
- 24(23) Scutal hair, close, very short, $< 0.5 \times \text{MOD}$ (A); scutum densely punctate, $i < d$ (B). *latipes* sp. nov.
 — Scutal hair open, length $> \text{MOD}$ (C); scutum openly punctate, $i = d$ towards periphery, 2–4d medially (D) *acaciae* (part)



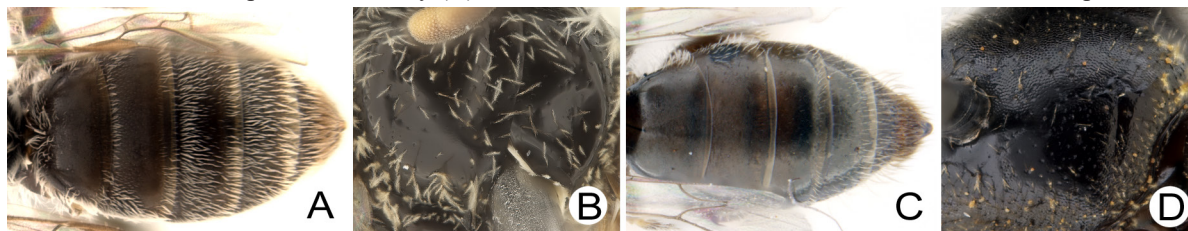
- 25(9) Metasomal terga steel blue or brassy green 26
 — Metasomal terga black or dark brown, sometimes with bronze or translucent apical margins 28
- 26(25) Metasoma brassy green (A) *prasinus* sp. nov.
 — Metasoma steel blue (B) 27



- 27(26) Propodeal triangle with longitudinal rugae (Fig. 55D) *simillimus*
- Propodeal triangle without rugae (Fig. 60D) *sulcatus* sp. nov.
- 28(25) Frons striate or vertically rugose 29
- Frons not striate 38
- 29(28) Scutum polished 30
- Scutum distinctly reticulate, occasionally slightly shiny 35
- 30(29) Metasomal T1 polished, remaining terga lineo-reticulate 31
- All metasomal terga lineo-reticulate 32
- 31(30) Propodeal triangle with longitudinal rugae halfway along subhorizontal surface, remainder polished (A); clypeal punctures dense, $i < 0.5$ *pachygenatus* sp. nov.
- Propodeal triangle without longitudinal rugae, basally transversely striate (B); metasoma brown; clypeal punctures open, $i = d$ *strigatus* sp. nov.

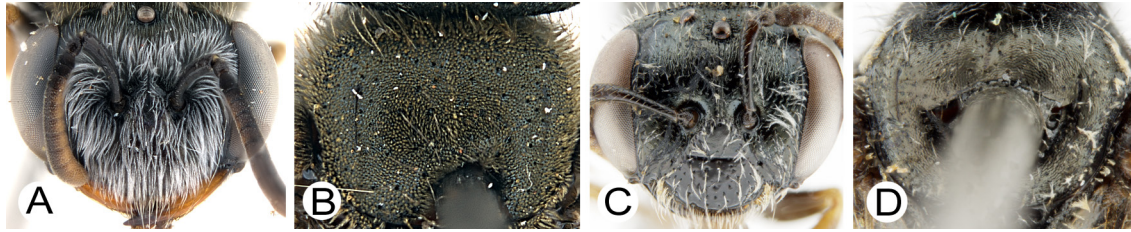


- 32(30) Mandible black with, at most, a short amber preapical region; claw with basal inner ramus 33
- Mandible orange or yellow; claw simple or inner ramus subapical 34
- 33(32) Scutum black; scutal hair open minutely branched; claw with large truncate basal tooth (Fig. 45B) *pachyramus* sp. nov.
- Scutum iridescent gold; scutal hair close strongly branched; claw with short triangular basal tooth (Fig. 9E) *bracteatus* sp. nov.
- 34(32) Metasomal T3–T5 with conspicuous adpressed hair (A), scutum polished (B) *brochus* sp. nov.
- Metasoma without conspicuous hair (C); scutum weakly reticulate punctate laterally (D) *brochellus* sp. nov.

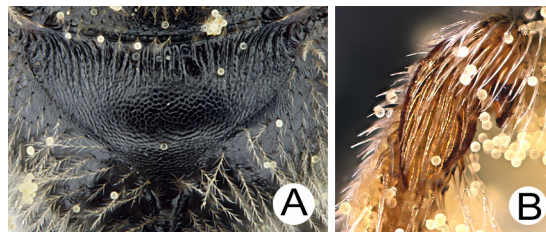


- 35(29) Scutum black 36
- Scutum brassy, sometimes weakly 37
- 36(35) Scutellum polished medially; scutal hair white *nigrescens*
- Scutellum dull; scutal hair dark brown *macropunctatus* sp. nov.

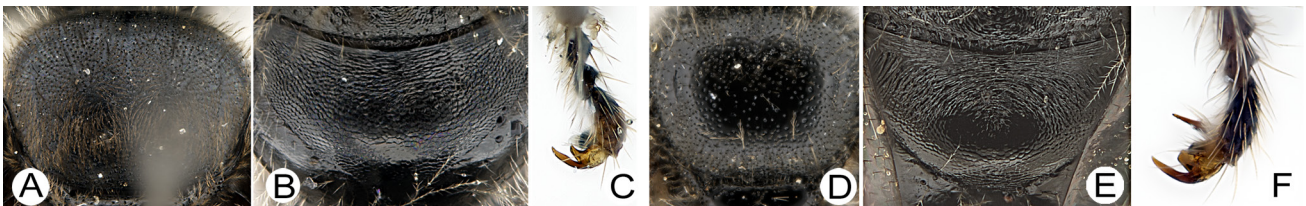
- 37(35) Mandible orange (A); scutum with close, tightly branched tomentum (B) *flavimandibulatus* sp. nov.
 — Mandible black with small amber preapical area (C); scutum with open, weakly branched hair (D) *flavipedatus* sp. nov.



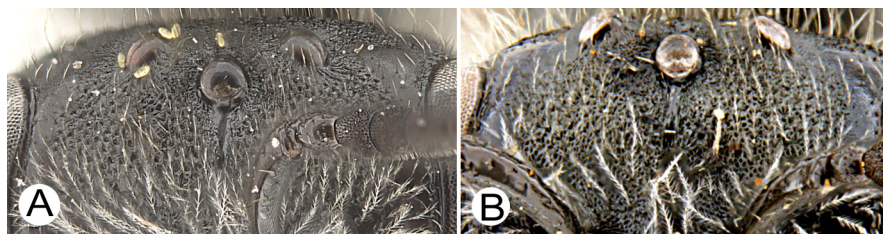
- 38(28) Scutum polished or shiny 39
 — Scutum distinctly reticulate and dull 45
 39(38) Propodeal triangle with longitudinal rugae 40
 — Propodeal triangle without longitudinal rugae 43
 40(39) Propodeal triangle with basal rugae only (A); inner hind tibial spur with *ca* 6 teeth as long as width of spur; hind basitibial plate with golden setae (B) *halictiformis*
 — Propodeal triangle with rugae to end of subhorizontal area; inner hind tibial spur with 9 or more teeth half as long as width of spur; hind basitibial plate with dark setae 41



- 41(40) Scutum shiny with a variable, distorted pattern (Fig. 41C) *mutabilis* sp. nov.
 — Scutum polished 42
 42(41) Metasoma openly punctate with weakly reticulate interspaces; flagellum short, FL \approx 65 *caesicitus* sp. nov.
 — Metasoma reticulate, not obviously punctate; reticulation on T1 distinctly weaker than on subsequent terga; flagellar length moderate, FL=74–82 *striatulus*
 43(39) Frons and scutum weakly brassy; hind basitibial plate with golden setae *murinus* sp. nov.
 — Frons and scutum black; hind basitibial plate without golden setae 44
 44(43) Scutum closely and evenly punctate, i=d (A); propodeal triangle reticulate (B); claws with sharp inner tooth (C) *brunneipilosus* sp. nov.
 — Scutum openly punctate, i=2–5d medially (D); propodeal triangle with semicircular pattern of irregular rugae (E); claws with large truncate inner tooth (F) *amblycladus* sp. nov.



45(38) Frons areolate (A) 46
 — Frons scabrous or irregularly roughened (B) 51



46(45) Propodeal triangle basally with short longitudinal rugae (A) *impolitus* sp. nov.
 — Propodeal triangle without longitudinal rugae 47



47(46) Reticulation near base of propodeal triangle modified to form fine transverse striae (A); fovea-like areas of weakened sculpture on frons small or absent *imitator*
 — Reticulation on propodeal triangle unmodified (B); frons with large fovea-like shiny areas (C) 48



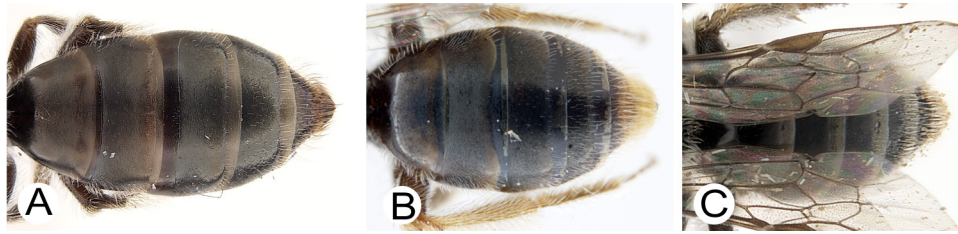
48(47) Clypeus polished between punctures; body length > 6 mm 49
 — Clypeus reticulate between punctures; body length < 6 mm 50

49(48) Scutal hair short, 0.5×MOD; clypeal hair weakly branched medially (A) *goonooensis* sp. nov.
 — Scutal hair moderately long, 1×MOD; clypeal hair closely branched (B) *arenarius* sp. nov.

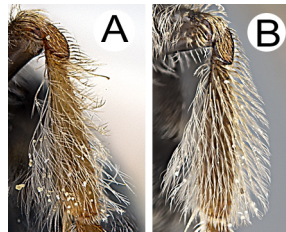


50(48) Hind basitibial plate with golden setae *sericeus* sp. nov. (part)
 — Hind basitibial plate without golden setae *sarogaster* sp. nov., *arenastrus* sp. nov. *
 51(45) Hind basitibial plate with golden setae 52
 — Hind basitibial plate without golden setae 54

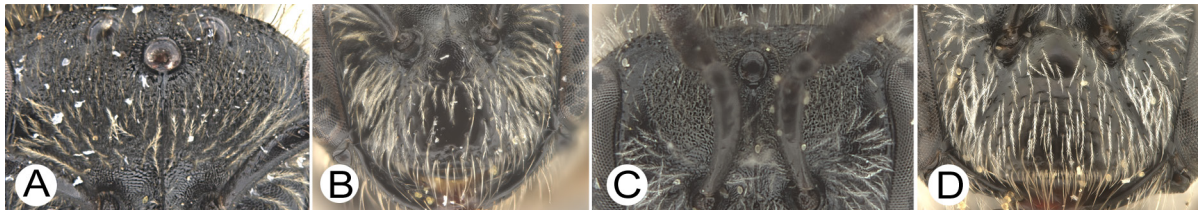
- 52(51) Metasomal terga with satin sheen and weakly bronze apical margins (A) *sericeus* sp. nov. (part)
 — Metasomal terga without satin sheen, apical margins translucent (B, C) 53



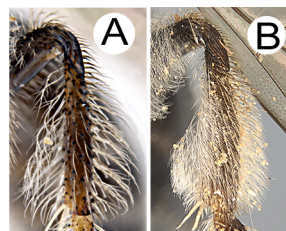
- 53(52) Hind tibial scopa open (A); scutal punctures $i=3-5d$; western Australia *chrysopyga* sp. nov.
 — Hind tibial scopa close (B); scutal punctures $i=2-4d$; eastern Australia *recurvatus* sp. nov.



- 54(51) Frons and scutum weakly brassy 55
 — Frons and scutum black 56
 55(54) Frons irregularly sculptured, but punctures visible (A);
 supraclypeal area reticulate (B) *comosus* sp. nov.
 — Frons rough, any punctures obscured (C); clypeus and
 supraclypeal area polished medially (D) *asperifrons* sp. nov.



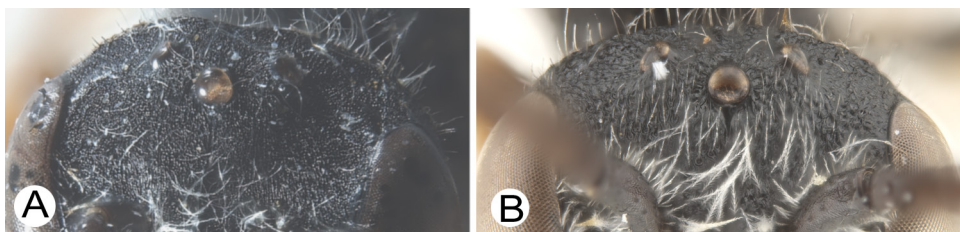
- 56(54) Head with vertex transversely flat (Fig. 42B) *nasutiformis* sp. nov.
 — Head with vertex transversely convex 57
 57(56) Body length *ca* 6 mm, hair of hind tibial scopa sparse,
 weakly branched (A) *edentatus* sp. nov.
 — Body length *ca* 10 mm, hair of hind tibial scopa close,
 well branched (B) *gaudii* sp. nov.



* Only one female specimen of *sarogaster* and two of *arenastrus* were available so that any small differences may have been within the range of intraspecific variation. Until more female specimens of both species are available it is not possible to separate these females without associated males.

Males

- 1. Upper paraocular and ocellocular areas depressed (A); body length >7.5 mm; metasomal terga black, with or without iridescence 2
- Upper paraocular and ocellocular areas not depressed (B); if body length >7.5 mm, metasomal terga at least partly red or brown 11



- 2(1) Metasomal S3 & S4 with white hair, either as paired tufts (A–C) or across apical margins (D); sterna elevated medially (“boat-shaped”) 3
- Metasoma sterna with sparse hair; sterna elevated or gently convex 6



- 3(2) S3 & S4 with unbroken rows of hair apically (Fig 20D) *criniventris* sp. nov.
- S3 & S4 with a pair of hair tufts either side of midline 4
- 4(3) Hair tufts on S3 & S4 long, $\geq 4 \times \text{MOD}$; S5 with medial patch of white hair (Fig. 21D) *cristativentris* sp. nov.
- Hair tufts on S3 & S4 mid length, $\leq 2.5 \times \text{MOD}$; S5 without medial hair 5
- 5(4) Clypeus with adpressed golden hair (A) *chrysopsis* sp. nov.
- Clypeus with adpressed silver hair (B) *vitrifrons*



- 6(2) Hind basitarsus long, thin, strongly curved (Fig. 31C) *heterodoxus*
- Hind basitarsus not modified 7
- 7(6) Flagellum short, FL<130; metasoma shiny *mungoensis* sp. nov.
- Flagellum long, FL>170; metasoma dull 8

8(7) Metasomal S5 with a medial patch of erect white hair (Fig. 34D) *korungensis*
 — Metasomal S5 without a hair patch 9

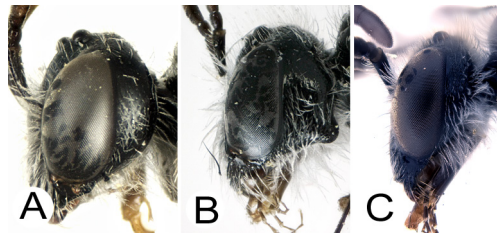
9(8) Legs black; clypeal hair pale gold *macalpinei* sp. nov.
 — Legs brown or orange-brown; clypeal hair silver 10

10(9) S6 with medial patch of stiff hair (Fig. 14C) *calvus* sp. nov.
 — S6 without medial patch of stiff hair *clivifrons* sp. nov.

11(1) Propodeal triangle with longitudinal rugae reaching at least middle of horizontal area 12
 — Propodeal triangle without longitudinal rugae or with short rugae basally..... 15

12(11) Scutum polished or shiny with variable, irregular reticulation; FL<200 13
 — Scutum dull, strongly reticulate; FL≈250 *simillimus*

13(12) Head wide, HL≈67; width gena *ca* 0.75×width compound eye viewed laterally (A, B) *pachygenatus* sp. nov.
 — Head width moderate, HL≈75; width gena *ca* 0.6×width compound eye viewed laterally (C) 14



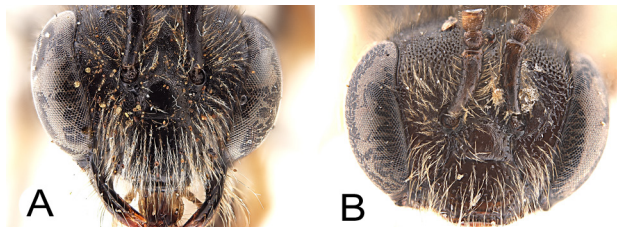
14(13) Scutum polished *striatulus*
 — Scutum with distorted wavy reticulation (Fig. 41C) *mutabilis* sp. nov.

15(11) Metasoma at least partly red-brown or orange-brown 16
 — Metasomal terga black or dark brown, sometimes with bronze apical margins 24

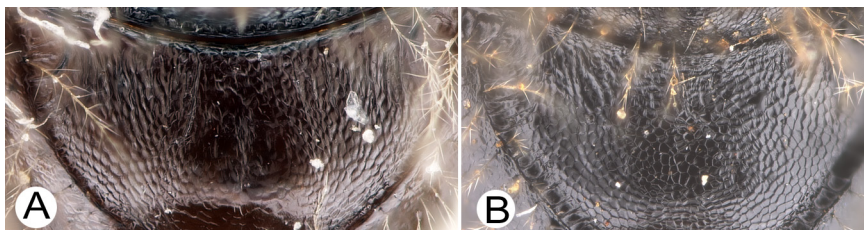
16(15) Metasomal T1 & T2 orange-brown, remaining terga dark brown (A) 17
 — Metasomal terga T2–T4 (and sometimes T1) banded orange/dark brown (B) 18



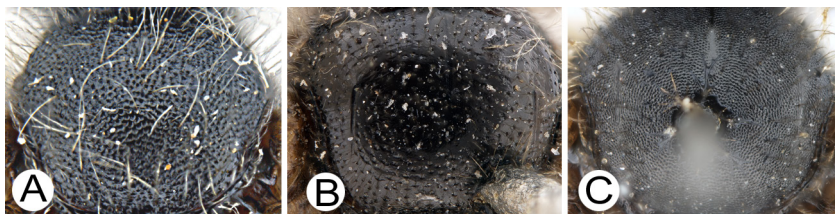
- 17(16) Body length *ca* 7 mm; clypeus with long semi-erect branched hair (A) *acaciae*
- Body length *ca* 6 mm; clypeus with short adpressed hair (B) *punctatifrons* sp. nov. (part)



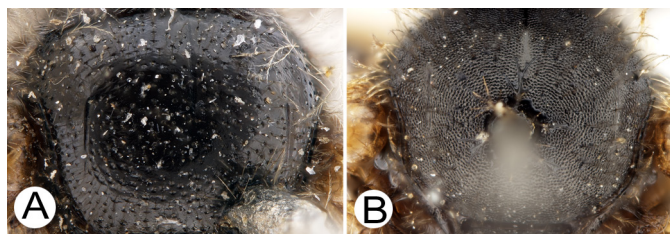
- 18(16) Propodeal triangle with basal (A, B) or basolateral longitudinal rugae 19
- Propodeal triangle without longitudinal rugae 21



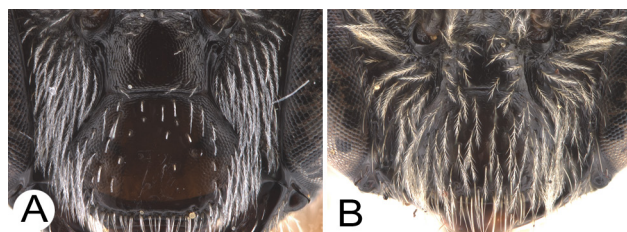
- 19(18) Flagellum very long, FL>200; scutum densely punctate with narrow, polished interspaces (A) *cygnellus*
- Flagellar length moderate, FL<150; scutum not densely punctate (B, C) 20



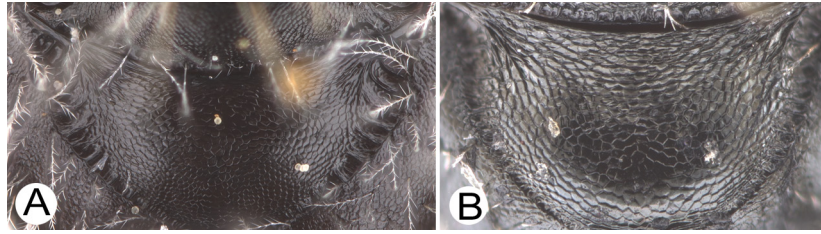
- 20(19) Scutum shining with open to close punctures (A) *punctatifrons* sp. nov. (part)
- Scutum dull and strongly reticulate (B) *latipes*



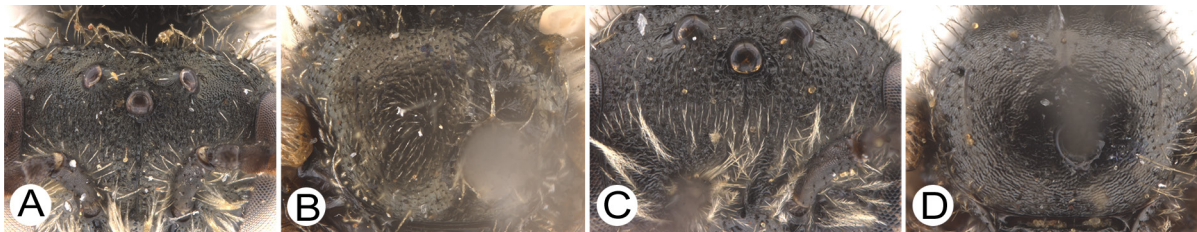
- 21(18) Clypeus moderately or strongly reticulate (A) 22
- Clypeus polished or weakly reticulate (B) 23



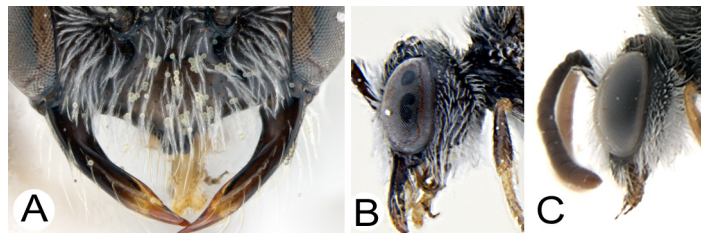
- 22(21) Propodeal suture with strong scrobiculate sulcus for most of length (A); flagellum long, FL \approx 200 *diloris* sp. nov.
 — Propodeal suture without strong scrobiculate sulcus for most of length (B); flagellar length moderate, FL \approx 150 *baeckekeae*



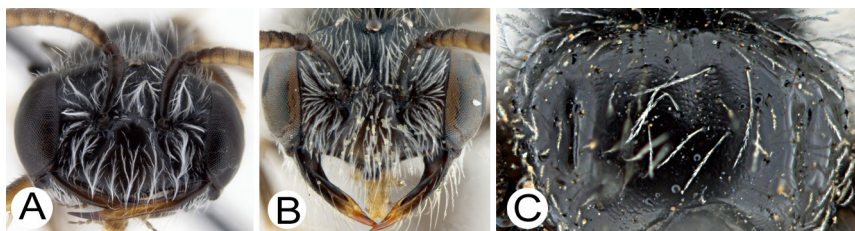
- 23(21) Frons irregularly rugose (A); scutum slightly iridescent, polished between close punctures (B) *rubiginosus*
 — Frons punctate (C); scutum black, moderately reticulate between open punctures (D) *brunneipilosus* sp. nov.



- 24(15) Hind basitarsus with a long, sharp spine medially and a shorter spine basally (Fig. 56C) *spinescens* sp. nov.
 — Hind basitarsus unmodified 25
 25(24) Frons striate 26
 — Frons with at most weak or irregular striae 30
 26(25) Clypeus with apicomedial rectangular projection (A); gena broad, angular viewed laterally (B) 27
 — Clypeus without rectangular projection; gena normal (C) 28



- 27(26) Mandible mostly pale (A); scutum polished *brochus* sp. nov.
 — Mandible mostly black (B); scutum weakly reticulate (C) *brochellus* sp. nov.



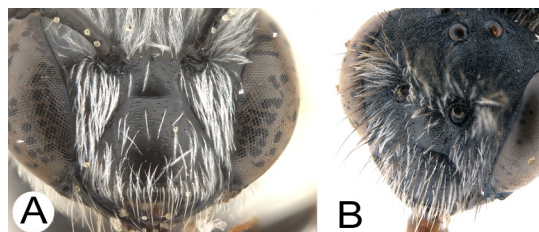
- 28(26) Scutum black; flagellum subgeniculate (A) *nigrescens*
 — Scutum with weak brassy sheen; flagellum not subgeniculate (B) 29



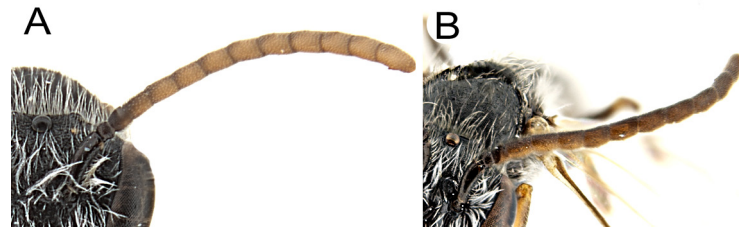
- 29(28) Wings tinted brown; mid and hind tibiae and basitarsi orange-brown.....*edentatus* sp. nov. (part)
 — Wings hyaline; mid and hind tibiae and basitarsi dark brown *flavimandibulatus*
 30(25) Scutum polished *strigatus* sp. nov.
 — Scutum reticulate and dull or slightly shiny 31
 31(30) Metasomal sterna mostly dark 34
 — Metasomal sterna at least 50% pale 32
 32(31) Body length *ca* 8 mm; clypeal punctures sparse, $i=6-10d$ (A) *australiensis*
 — Body length *ca* 5 mm; clypeal punctures open or close, $i<4d$ 33



- 33(32) Clypeal punctures open, $i=2-4d$; flagellum short, $FL\approx 120$ *imitator*
 — Clypeal punctures close, $i=1-2d$; flagellum long, $FL\approx 200$ *viridescens* (part)
 34(31) Scutum black 35
 — Scutum with weak brassy sheen 40
 35(34) Clypeal hair sparse, short, $<MOD$, adpressed, white (Fig. 33G) *impolitus* sp. nov.
 — Clypeal hair sparse, open or close, length $>MOD$, semi-adpressed 36
 36(35) Clypeal hair sparse or open 37
 — Clypeal hair dense, white, without dark setae 38
 37(36) Metasoma black with translucent tergal margins; clypeal hair sparse (A) *goonooensis* sp. nov.
 — Metasoma dark red-brown; clypeal hair sparse interspersed with numerous dark setae (B) *euscopatus* sp. nov.



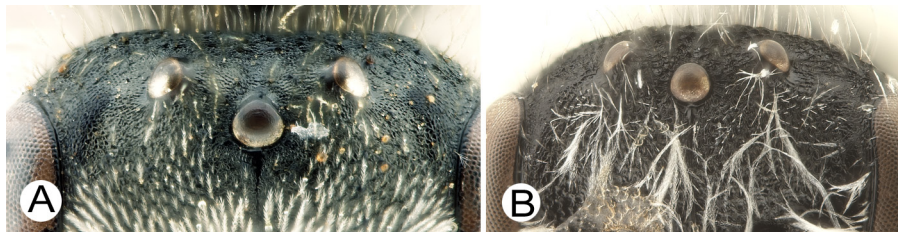
- 38(36) Flagellum ventrally bright yellow-brown; FL \geq 140 *sarogaster* sp. nov.
 — Flagellum ventrally dark brown or partly dull orange-brown;
 FL $<$ 120 39
- 39(38) Mid basitarsus longitudinally bowed (Fig. 50C) *recurvatus* sp. nov.
 — Mid basitarsus straight *chrysopyga* sp. nov.
- 40(34) Flagellum moderately long, FL $>$ 150 41
 — Flagellum mid-length or short, FL $<$ 150 43
- 41(40) Flagellar segments cylindrical (A); FL $<$ 170 *arenastus* sp. nov.
 — Flagellum subgeniculate (B); FL $>$ 180 42



- 42(41) Hind basitibia dark brown (A); scutellum shiny (B) *flavipedatus* sp. nov.
 — Hind basitibia yellow brown (C); scutellum dull (D) *viridescens* (part)



- 43(40) Frons scabrous (A) 44
 — Frons areolate or closely punctate (B) *arenarius* sp. nov.



- 44(43) First recurrent vein of forewing entering second submarginal cell; metasoma dark brown with translucent tergal margins *murinus* sp. nov.
 — First recurrent vein of forewing almost meeting first transverse cubital vein; metasoma black, sericeous without translucent tergal margins *conjunctus* sp. nov.

Leioproctus (Euryglossidia) acaciae
(Rayment, 1939)

Fig. 2

Euryglossidia acaciae Rayment, 1939: 274

Leioproctus (Euryglossidia) acaciae—Michener, 1965: 68.

Syntypes. 5♂ Emerald, VIC, 9 Sept 1935, Rayment, ANIC 32-067840–43 (plus one not databased)—it has been assumed that the date “September 1936” given in the original description is a typographical error.

Lectotype. The syntype bearing the label ANIC 32-067843 is here designated as the lectotype of *Leioproctus acaciae* (Rayment, 1939).

Other specimens examined. 6♀, Mount Drummer, VIC (37.5°S 149.3°E), 4 Dec 1956, E.F. Riek, ANIC; 3♀ 2♂, Nadgee Reserve, 3 km N Newtons Beach, NSW (37.34°S 149.94°E), 9 Sep 1985, R. W. Thorp, AMS K.95571, 73, K.396054–56; 5♀ 9♂, Mount Tomah, NSW (33.544°S 150.421°E), 19–24 Aug 1977, 30 Jul 1978, N.W. Rodd., K.396057–70.

Diagnosis. Body length about 7 mm, head and mesosoma black, frons finely reticulate without significant punctures or rugae, scutal hair mostly dark brown, wings brown tinted, propodeal triangle with longitudinal rugae basally only, metasoma partly yellow-brown with variable darker markings. Hair of female hind tibial scopa open, brown.

Redescription of male. Body length 7.0 mm. Relative head measurements: HW 100; HL 71; UFW 68; LFW 52; CL 25; FL 156; SL 30.

Clypeus gently convex, clypeus and supraclypeal area flattened medially, supraclypeal area weakly raised; flagellum moderately long, segments fl2–fl11 longer than

wide; facial carina reaches median ocellus; hind leg long with basitarsus $\frac{3}{4}$ as long as tibia.

Colouration. Head and mesosoma black except mandible with short preapical region amber, flagellum brown; legs dark brown proximally, orange-brown from ends of femora to tarsi; wings tinted yellow; metasomal T1 and T2 yellow-brown, remaining terga black or dark brown, sterna similarly coloured.

Pubescence. Clypeus and lower paraocular areas with close cover of semi-adpressed, plumose, dull white hair, $2\times\text{MOD}$ interspersed with dark simple setae; elsewhere on face hair open to sparse, erect, pale brown, $2\times\text{MOD}$ interspersed with longer dark setae; gena with close, erect, white, plumose hair, $1-4\times\text{MOD}$; hair on scutum open, erect, pale brown, minutely branched, $2\times\text{MOD}$, interspersed with sparse, longer setae; mesepisternum with open, plumose white hair, $ca\ 3\times\text{MOD}$; hair on metasoma sparse.

Sculpture. Face below antennal sockets shiny with weak reticulation, above sockets dull with strong reticulation; clypeus with small punctures, $i=d$; supraclypeal area sparsely punctured; frons scabrous; scutum and scutellum openly punctate with reticulate interspaces, $i=3-5d$; propodeal triangle more coarsely reticulate with a few irregular rugae basally, peripheral suture marked by a narrow scrobiculate sulcus; metasomal terga weakly reticulate.

Description of female. Body length 6.7 mm. Relative head measurements: HW 100; HL 81; UFW 73; LFW 64; CL 26; FL 80; SL 37.

Clypeus transversely convex; mandible bidentate, smoothly curved; flagellum short, segments fl1–fl9 shorter than wide; inner hind tibial spur with 4–6 teeth as long as width of spur; claws with subapical inner tooth.

Colouration. Head and mesosoma black except mandible largely amber with dark red tip, flagellum dark brown dorsally, yellow-brown ventrally, tegula amber, fore and mid tibiae, all tarsi orange-brown, wings tinted yellow. Metasoma

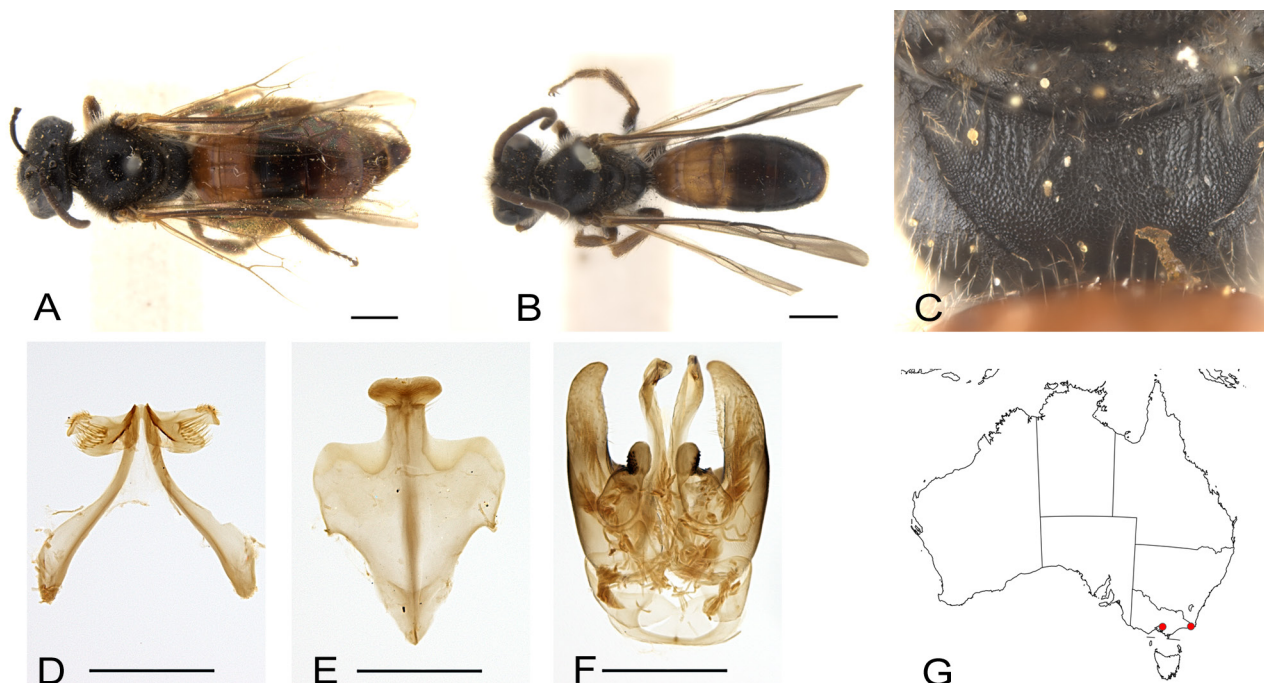


Figure 2. *Leioproctus (Euryglossidia) acaciae* (Rayment): A, ♀ dorsal view; B, ♂ dorsal view; C, ♀ propodeal triangle; D–F, ♂ terminalia ventral views; G, collection locations. Scale bars: A, B, 1 mm; D–F, 200 μm .

red-brown with irregular dark brown suffusions, T2 laterally with small, oval black marks.

Pubescence. Facial hair sparse, on lower paraocular areas golden, weakly branched, interspersed with longer simple setae; some white, closely branched hair, $1\times\text{MOD}$, around antennal sockets; upper frons with fine, mostly simple setae; hair on gena open, white, closely branched, $1-2\times\text{MOD}$; on scutum and scutellum erect, tightly branched, pale brown and very short, $\sim 0.2\times\text{MOD}$; on sides of mesosoma sparse, white, plumose, $\sim 3\times\text{MOD}$; hair of hind tibial scopa close, brown except white on anterior edge and a few simple stiff hairs near the basitibial plate. Hair on metasomal terga sparse apart from brown prepygidial fimbria; apical half to one third of metasomal sterna S2–4 with white, plumose, erect hair, $2-3\times\text{MOD}$; S5, S6 with dense golden-brown apical fringes.

Sculpture. Lower face shiny but frons strongly reticulate; punctures of clypeus strong, medium with polished interspaces, $i=1-2d$; supraclypeal area weakly reticulate, sparsely punctate medially, more closely on sloping sides; punctures of lower paraocular areas weak, small with reticulate interspaces, $i=d$; of frons weak and small with strongly reticulate interspaces, $i\approx 2d$; scutum and scutellum with strong reticulation obscuring any punctures; propodeal triangle reticulate, peripheral suture weakly indicated; metasomal terga with a few scattered setiferous punctures becoming denser towards fimbria.

Variation. Females vary in body length from 6.5 to 7.2 mm (mean 6.9, s.d. 0.2, n 6), males from 6.8 to 7.9 mm (mean 7.2, s.d. 0.5, n 5).

Leioproctus (*Euryglossidia*) *amblycladus* sp. nov.

urn:lsid:zoobank.org:act:C1F022C7-0537-4F3D-9A7D-9869454783A7

Fig. 3

Holotype. ♀ Cocoparra NP, NSW (34.1217°S 146.2353°E), 14 Sep 2011, M. Batley, on *Grevillea floribunda*, AMS K.361307.

Paratypes. 2♀, data as for holotype, AMS K.361308–9.

Diagnosis. Medium size, claw with large, truncate basal tooth, dark with vague iridescent sheen, metasomal terga with bronze apical margins, inner hind tibial spur with *ca* 4 widely-spaced teeth, very like *pachyramus* but frons without rugae and propodeal triangle with unique curved rugae.

Description of female. Body length 7.0 mm. Relative head measurements: HW 100; HL 85; UFW 68; LFW 61; CL 29; FL 74; SL 32.

Inner orbits ventrally convergent; clypeus gently convex, except adjacent to ventral margin; mandible bidentate, outer ridge prominent; flagellum short, segments fl2–fl6 shorter than wide; gena slightly more than half as wide as compound eye viewed laterally; inner hind tibial spur with *ca* 4 widely-spaced teeth longer than width of spur; claws with large, truncated basal tooth (Fig. 3B).

Colouration. Head and mesosoma black except flagellum, tegula and legs dark brown with anterior face of fore tibia yellow-brown, all areas except clypeus and scutellum may show vague iridescent reflections; metasomal terga bluish-black with bronze apical margins, sterna dark brown.

Pubescence. Clypeal hair sparse, hair of lower paraocular areas and lower frons open, white, closely branched, $2\times\text{MOD}$; of frons and vertex fine, mid brown, weakly branched, $1\times\text{MOD}$; hair on scutum open, mid-brown, plumose, $0.5\times\text{MOD}$, interspersed longer weakly branched hair, $1.5\times\text{MOD}$; hair on mesosoma laterally white, plumose, $3-4\times\text{MOD}$; hair of hind tibial scopa sparse, white with open, bipectinate branching on anterior margin, brown and pectinate medially, brown and simple setae on posterior margin and near the basitibial plate; metasomal terga with sparse hair except prepygidial fimbria close, dark brown; apical $\frac{1}{3}$ of metasomal sterna S2–5 with open, erect, weakly branched, white hair, $2-3\times\text{MOD}$, S5 and S6 with dense, apical fringes.

Surface sculpture. Clypeus highly polished with strong, medium sized punctures, $i<d$ medially, sparse and small ventrally; front face of supraclypeal area impunctate; punctures of lower paraocular areas mid-sized, $i<d$ with polished interspaces; frons with strong, small contiguous punctures, fovea indicated by absence of punctures; punctures of scutum small, $i\approx d$, with polished interspaces; scutellum polished, impunctate except around margins; propodeal triangle pit-reticulate with fine transverse striae on basal half, curving laterally to cross a shallow, broad sulcus marking the peripheral suture; metasoma finely reticulate.

Male. Unknown.

Floral records. *Grevillea*.

Etymology. The specific epithet is a Latinised adjective formed from the Greek words for blunt and branch, referring to the inner tooth of the female claw.

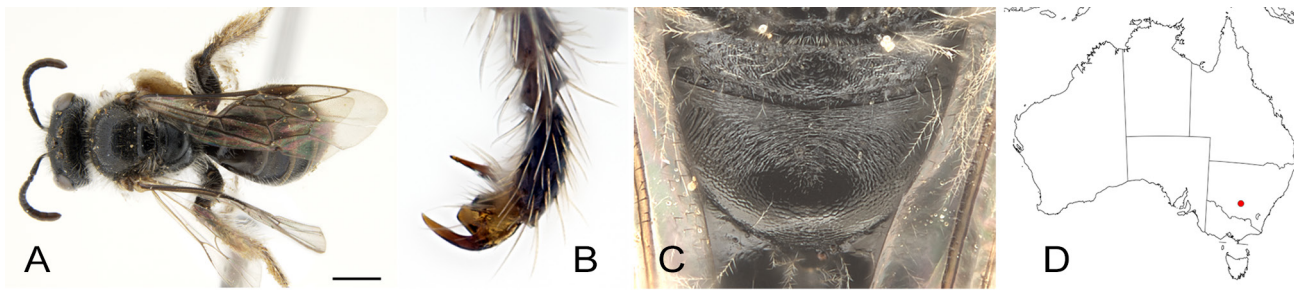


Figure 3. *Leioproctus* (*Euryglossidia*) *amblycladus* sp. nov. ♀: A, dorsal view, scale bar 1 mm; B, hind claw; C, propodeal triangle; D, collection locations.

*Leioproctus (Euryglossidia)**arenarius* sp. nov.

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Fig. 4

Holotype. ♀ 13 km S Wannoo, WA (26.930°S 114.625°E), 21–23 Aug 1985, T.F. Houston, on *Hakea*, WAM 10618.

Paratypes. 1♂ 9♀, same collection data as holotype, WAM 20828, 10619–27; 17♀, Mount Gibson Stn, WA (29.7°S 117.3°E), 21–29 Aug 2001, R. Leys, on *Acacia*, *Cassia* & *Hakea*, SAM 32-44656–72; 1♀, Badgingarra NP, WA (30.365°S 115.481°E), 10 Oct 2005, L. Packer, YUC.

Other specimens examined: 56♀, same collection data as holotype, WAM 10628–83; 5♀, Credo Stn, Emu Rock, WA (30.5°S 120.7°E), 1–6 Sep 2011, R. Leijs, on *Acacia*, SAM 32-44769–73; 2♀, 18km N Menzies, WA (29.581°S 121.163°E), 27 Sep 2005, L. Packer, YUC; 2♀, Eurardy HS, WA (27.568°S 114.657°E), 9 Oct 2005, L. Packer, YUC.

Diagnosis. Small, mostly black, scutum reticulate and dull; metasoma with satin sheen, less pronounced posteriorly, clypeus polished between close punctures, hair on clypeus closely branched, frons densely punctate to areolate, propodeal triangle without rugae, female hind tibial scopal hair open, white and pale brown.

Description of female. Body length *ca* 6.5 mm. Relative measurements: HW 100; HL 76; UFW 69; LFW 58; CL 35; FL 72; SL 30.

Inner orbits converge ventrally; mandible bidentate, smoothly curved; clypeus convex, supraclypeal area prominent with distinct dorsolateral and anterior faces; frontal carina weak and short; flagellum short, segments fl2–fl7 shorter than width; gena *ca* half as wide as compound

eye viewed laterally; inner hind tibial spur with 4–5 teeth as long as width of spur; claws with sharp subapical tooth.

Colouration. Black except flagellum dark brown dorsally, ventrally orange-brown on apical half, legs brown with anterior face of fore tibia orange-brown, mesosoma with very weak iridescent sheen, apical margins of metasomal terga bronze.

Pubescence. Hair on clypeus, paraocular areas and lower frons open, white, closely branched, 1.5×MOD; scutal hair pale brown, erect, openly-branched, 0.5–1.0×MOD; hair of mesepisternum white, plumose, ~2×MOD; hair of hind tibial scopa open, white, bipectinate on anterior half, pale brown, pectinate on posterior half; metasomal hair sparse dorsally apart from dark brown prepygidial fimbria; hair of metasomal sterna S2–5 open, erect, white, plumose with some crinkled tips, 2–3×MOD; apical fringes of S5, S6 dense, 2×MOD.

Sculpture. Punctures on clypeus, paraocular and supraclypeal areas mid-sized to large, $i < d$, interspaces polished, weakly reticulate; frons with contiguous, strong, mid-sized punctures; scutum strongly reticulate largely obscuring close punctures, $i = 1–4d$; scutellum less strongly reticulate, punctures mid-sized, $i < 0.5d$; propodeal triangle more coarsely reticulate with weak peripheral suture.

Description of male. Body length 5.0 mm. Relative measurements: HW 100; HL 80; UFW 70; LFW 54; CL 26; FL 123; SL 30.

Inner orbits ventrally convergent; mandible bidentate, smoothly curved; clypeus and supraclypeal area gently convex; frontal carina extending half way to median ocellus; flagellum of moderate length, segments fl3–10 longer than wide.

Colouration. As for female except flagellum ventrally yellow-brown, anterior faces of fore tibia and all tarsi yellow.

Pubescence. Hair of face as for female but longer, 2×MOD; hair of scutum sparse, erect, white, weakly

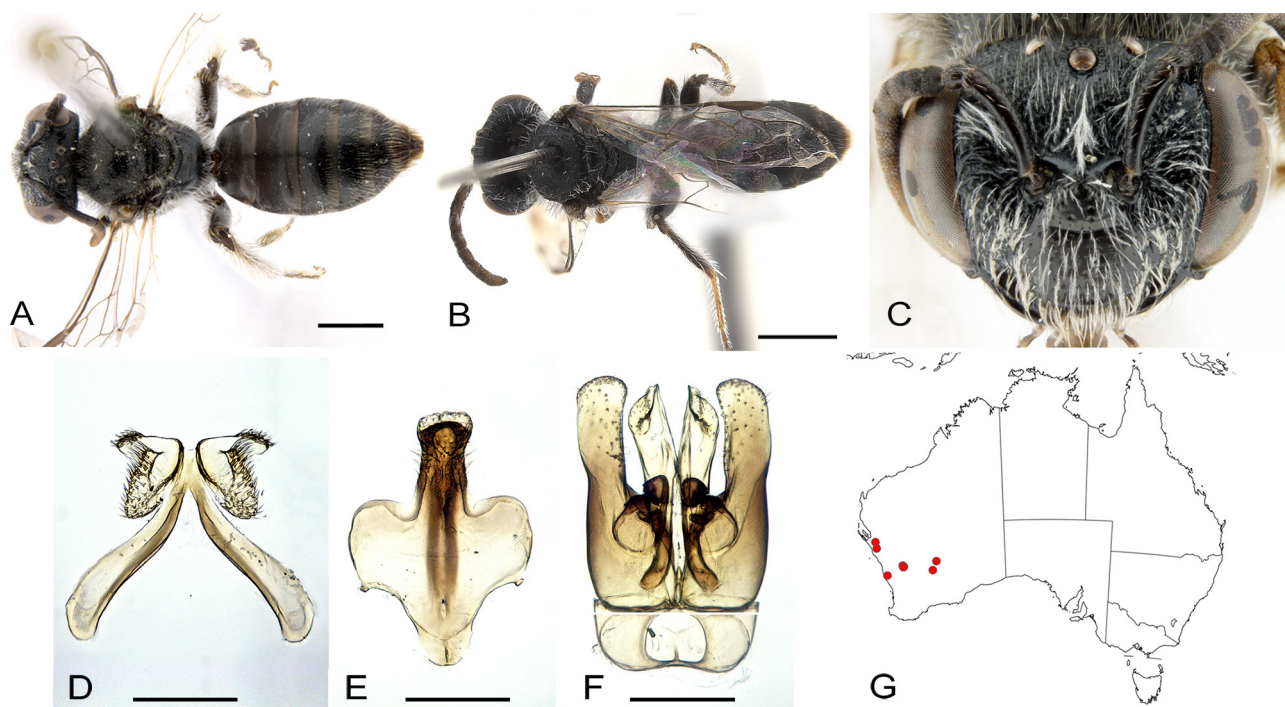


Figure 4. *Leioproctus (Euryglossidia) arenarius* sp. nov.: A, ♀ dorsal view; B, ♂ dorsal view; C, ♀ face; D–F, ♂ terminalia ventral views; G, collection locations. Scale bars: A, B, 1 mm; D–F, 200 µm.

branched, 1–1.5×MOD; hair of mesepisternum and sides of propodeum white, plumose, 3×MOD; hair on metasoma sparse, sternum S5 with white apical fringe, 0.5×MOD.

Sculpture. As for female.

Variation. In females, length of first abscissa of posterior vein of second submarginal cell varies between 0.5 and 1.0 times length of first submarginal cross vein and length of scutal hair ranges between 0.5 to 1.0×MOD. Intermediate values were observed, so it remains unclear whether this a single species or an unresolved species group.

Etymology. The specific epithet is a Latin adjective meaning associated with sand. While many species are known from sandy areas this is one that is known from a number of well separated sites.

Leiproctus (*Euryglossidia*)

arenastrus sp. nov.

urn:lsid:zoobank.org:act:9810904A-E3AB-4C3F-ADBE-1B7081569C01

Fig. 5

Holotype. ♂ Credo Stn, WA (30.494°S 120.673°E), 6 Sep 2011, R. Leijs, on *Acacia*, SAM 32-44775.

Paratypes. 1♀, same collection data as holotype, SAM 32-44776; 1♀, Credo Stn, Emu Rock, WA (30.431°S 120.638°E), 1 Sep 2011, R. Leijs, on *Keraudrenia integrifolia*, SAM 32-44774.

Diagnosis. Small, mostly black, metasoma with satin sheen, less pronounced posteriorly, frons densely punctate to areolate; scutum reticulate and dull, female hind tibial scopal hair open, white and pale brown, very like *arenarius* but female clypeus reticulate between punctures, male flagellum

not subgeniculate and shape of S8 differs. The females of *arenastrus* and *sarogaster* cannot be reliably separated until a greater number of specimens is available.

Description of male. Body length 5.5 mm. Relative measurements: HW 100; HL 80; UFW 70; LFW 53; CL 27; FL 155; SL 27.

Inner orbits ventrally convergent; mandible bidentate, smoothly curved; clypeus and supraclypeal area gently convex; frontal carina extending half way to median ocellus; flagellum of moderate length, segments fl3–fl10 longer than wide.

Colouration. As for female except apical half of flagellum ventrally yellow-brown, anterior face of fore tibia and all tarsi yellow.

Pubescence. Hair on clypeus, paraocular areas and lower frons open, white, closely branched, 2×MOD; hair of scutum sparse, erect, white, weakly branched, 1–1.5×MOD; hair of mesepisternum and sides of propodeum white, plumose, 3×MOD; hair on metasoma sparse, sternum S5 with white apical fringe, 0.5×MOD.

Sculpture. Punctures on clypeus, paraocular and supraclypeal areas mid-sized to large, $i < d$, interspaces polished, weakly reticulate; frons with contiguous, strong, mid-sized punctures; scutum strongly reticulate largely obscuring any punctures; scutellum less strongly reticulate, punctures mid-sized, $i < 0.5d$; propodeal triangle more coarsely reticulate with weak peripheral suture.

Description of female. Body length ca 6.5 mm. Relative measurements: HW 100; HL 76; UFW 68; LFW 60; CL 35; FL 72; SL 30.

Inner orbits converge ventrally; mandible bidentate, smoothly curved; clypeus convex, supraclypeal area prominent with distinct dorsolateral and anterior faces; frontal carina weak and short; flagellum short, segments fl2–fl7 shorter than width; gena ca half as wide as compound

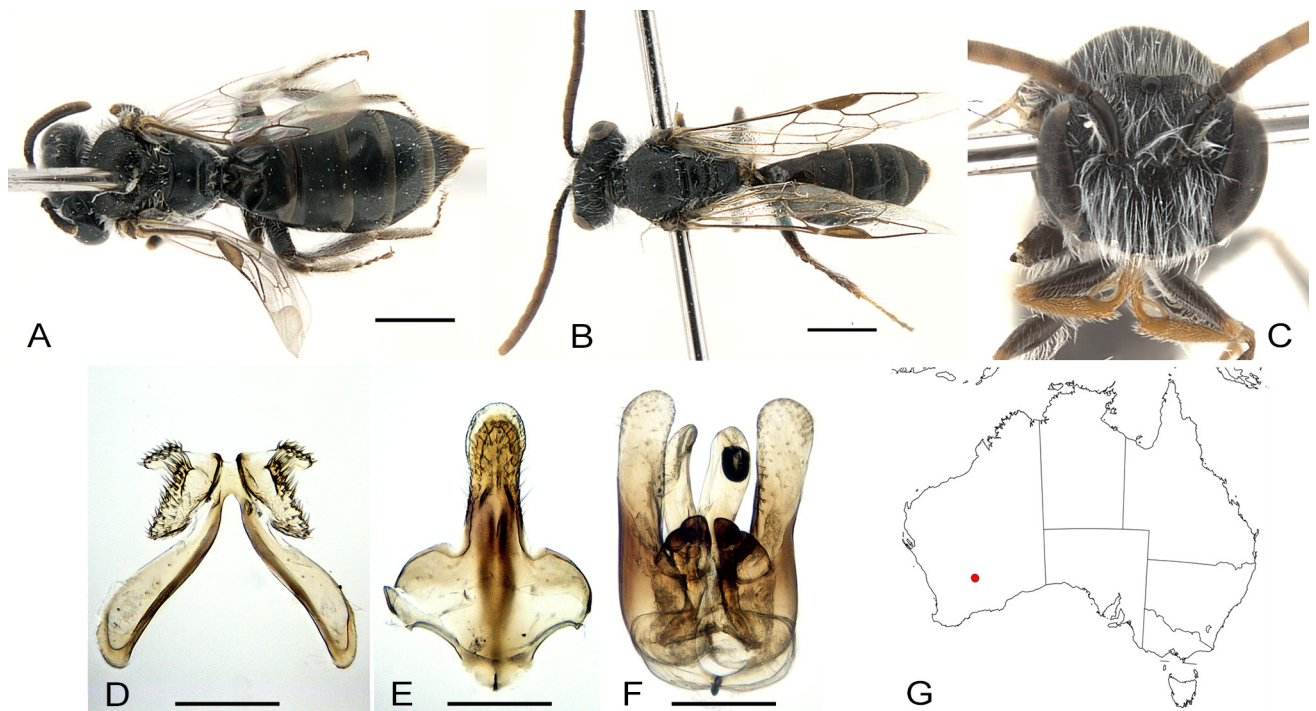


Figure 5. *Leiproctus* (*Euryglossidia*) *arenastrus* sp. nov.: A, ♀ dorsal view; B, ♂ dorsal view; C, ♂ face; D–F, ♂ terminalia ventral views; G, collection locations. Scale bars: A, B, 1 mm; D–F, 200 µm.

eye viewed laterally; inner hind tibial spur with 4–5 teeth as long as width of spur; claws with sharp subapical tooth.

Colouration. Black except flagellum dark brown dorsally, ventrally orange-brown on apical half, legs brown with anterior face of fore tibia orange-brown, all tarsi brown, mesosoma with very weak iridescent sheen, apical margins of metasomal terga bronze.

Pubescence. Hair on clypeus, paraocular areas and lower frons open, white, closely branched, $1.5 \times \text{MOD}$; scutal hair pale brown, erect, openly-branched, $0.5\text{--}1.0 \times \text{MOD}$; hair of mesepisternum white, plumose, $\sim 2 \times \text{MOD}$; hair of hind tibial scopa open, white, bipectinate on anterior half, pale brown, pectinate on posterior half; metasomal hair sparse dorsally apart from dark brown prepygidial fimbria; hair of metasomal sterna S2–5 open, erect, white, plumose with some crinkled tips, $2\text{--}3 \times \text{MOD}$; apical fringes of S5, S6 dense, $2 \times \text{MOD}$.

Sculpture. As for male.

Etymology. The specific epithet is a Latin adjective meaning resembling *arenarius*.

Leioproctus (Euryglossidia)

asperifrons sp. nov.

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Fig. 6

Holotype. ♀ 40 km S Menzies, WA (30.03°S 121.16°E), 27 Sep 2005, L. Packer, AMS K.396335.

Paratypes. 3♀, same collection data as holotype, 1♀ in AMS K.396336, 2♀ in YUC.

Diagnosis. Small, head and mesosoma black with weak brassy sheen, frons gently prominent medially, roughened except adjacent to inner orbits, scutum reticulate, hind basitibial plate without golden setae, propodeal triangle without rugae, metasoma satiny bronze; similar to *comosus* but punctures not visible on frons and supraclypeal area polished medially.

Description of female. Body length 6 mm. Relative head measurements: HW 100; HL 76; UFW 70; LFW 58; CL 27; FL 74; SL 29.

Inner orbits parallel; clypeus and supraclypeal area gently convex; mandible bidentate, smoothly curved; frontal carina extending just over half way to median ocellus; flagellum short, segments fl1–fl9 shorter than wide; gena a little over half as wide as compound eye viewed laterally; inner hind tibial spur with *ca* 4 teeth longer than width of shaft; claws

with sharp medial inner tooth.

Colouration. Head and mesosoma black except frons, scutum, part of scutellum, metanotum and propodeal triangle brassy, flagellum brown dorsally, mostly yellow-brown ventrally, tegulae transparent brown, legs dark brown, except base and part of front surface of fore tibia orange-brown, mandible black with dark red tip; metasoma dark brown with brassy tint, apical margins of terga smoother and paler but not producing a distinctly banded appearance; prepygidial fimbria light brown.

Pubescence. Hair of clypeus, paraocular area and gena open, white, finely branched $2 \times \text{MOD}$, interspersed with simple setae; hair of scutum white to pale brown, tightly branched, $1.0 \times \text{MOD}$; hair of mesepisternum white, closely branched, $2 \times \text{MOD}$, hair of hind tibial scopa sparse, white, weakly openly bipectinate on anterior margin, openly pectinate on posterior margin; metasomal hair sparse except for brown prepygidial fimbria, bands of white, open to close, erect hair, $2 \times \text{MOD}$, on apical $\frac{1}{3}$ of metasomal sterna S2–5, and dense, golden-brown, apical fringes on S5, S6, $1 \times \text{MOD}$.

Sculpture. Punctures of clypeus and lower paraocular areas mid-sized, $i=0.5\text{--}1.0d$, with polished, weakly reticulate interspaces; anterior face of supraclypeal area almost impunctate; frons medially coarsely roughened with strong reticulation obscuring small punctures, adjacent to inner orbits interspaces polished (Fig. 6B); punctures of scutum and scutellum small, $i=3\text{--}4d$, with reticulate interspaces; propodeal triangle more coarsely reticulate; metasomal terga with fine, satin lineo-reticulation, almost impunctate.

Male. Unknown.

Etymology. The specific epithet is a Latin noun in apposition referring to the roughened central area of the frons.

Leioproctus (Euryglossidia) australiensis

(Dalla Torre, 1896)

Fig. 7

Scapter bicolor Smith, F. 1862: 61. [junior primary homonym of *Scapter bicolor* Lepeletier, 1825].

Macropis australiensis Dalla Torre, 1896: 193. [*nom. nov.* for *Scapter bicolor* Smith, 1862].

Euryglossidia rectangulatus Cockerell, 1910: 359. **new synonymy.**

Leioproctus (Euryglossidia) australiensis—Michener, 1965: 68.

Leioproctus (Euryglossidia) rectangulatus—Michener, 1965: 69.



Figure 6. *Leioproctus (Euryglossidia) asperifrons* sp. nov. ♀: A, dorsal view, scale bar 1 mm; B, frons; C, inner hind tibial spur; D, collection locations.

Holotype. ♀ of *bicolor*, Australia, NHM Hym.17.a.291—examined using images from NHM portal; metasoma detached, glued to card, right foreleg, hind femur, tibia and tarsus missing.

Holotype. ♀ of *rectangulatus*, Victoria, 2 Jul 1901, NHM Hym.17.a.289—examined using images from NHM Portal.

Other specimens examined: 5♀, Castlereagh NR, NSW (33.686°S 150.759°E), 19 & 21 Sep 2001, 16 Sep 2002, M. Batley, on *Dillwynia sieberi*, AMS K.593242–7; 2♂, Cheltenham, NSW (33.75°S, 151.08°E), 12 & 27 Aug 1950, N.W. Rodd, AMS K.396233, K.540285; 2♂ 1♀, Kings Plains NP, NSW (29.582°S 151.389°E), 19 Sep 2000, M. Batley, on *Pultenaea*, AMS K.593248; 4♀ 1♂, Lake Macquarie SRA, NSW (33.03°S, 151.56°E), 1–8 Sep 2001 & 27 Aug 2003, J. Indsto, on *Dillwynia retorta*, AMS K.224756–57, 59–60, K.224820; 2♂ 2♀, Lane Cove, NSW (33° 48' 52" S, 151° 10' 11" E), 30 Jul–26 Aug 1944, N.W. Rodd, AMS K.396234–7; 4♂ 3♀, Pennant Hills, NSW (33.730°S 151.062°E), 8 Aug 2005, 13 & 23 Aug 2017, M. Batley, on *Dillwynia retorta*, AMS K.224594–6, K.361129, K.517352, 55, 56.

Diagnosis. Medium sized, head and mesosoma black, metasoma variable from clear orange-brown to infuscated red-brown (female) or dark brown (male), clypeus polished (female) or shiny (male) with open to sparse punctures, frons striate, female hind tibial scopa sparse with weakly branched hairs, male flagellum *ca* 1.5× head width.

Redescription of female. Body length 8.0 mm. Relative head measurements: HW 100; HL 80; UFW 70; LFW 67; FL 73; SL 41.

Inner orbits parallel; mandible bidentate gently curved; clypeus transversely convex; flagellum moderately long, fl4–fl9 slightly longer than wide; frontal carina extends halfway to median ocellus replaced by a deep sulcus for the remaining distance; inner hind tibial spur with *ca* 10 teeth as long as width of spur; claws simple.

Colouration. Head and mesosoma black, except apical

half of mandibles amber, tips darker, flagellum brown, paler ventrally, tegula transparent amber, all tibiae and fore and mid tarsi orange-brown with some darker infusions, remainder of legs dark brown; metasoma variable from orange-brown to dark brown with red-brown suffusions, T1 dark brown and T2 and T3 laterally with large, oval patches of dark brown; wings brown tinted.

Pubescence. Long simple, brown setae 2–3×MOD ventrally on mandible and sparsely distributed over clypeus; white to pale brown, plumose hair on lower paraocular areas, lower frons and gena, 2×MOD; hair on scutum and scutellum fine, golden brown, weakly branched or simple, 2–3×MOD, interspersed with a few dark brown setae; hair on mesosoma laterally white, plumose, *ca* 2×MOD; hair of hind tibial scopa sparse, mostly brown, simple but paler with some weakly pectinate branching on anterior margin; hair on metasomal terga sparse except for dark brown prepygidial fimbria; sterna with white, pectinate hair in rows across apical ¼ of each sternum, *ca* 4×MOD; sparse, weakly branched on S2, becoming denser, with increased branching from S3 to S5; S5,6 with dense apical fringe.

Sculpture. Clypeus with a sparse to open mixture of mid-sized and small punctures with polished, weakly reticulate interspaces; lower paraocular areas with small punctures *i*=1–3d; frons finely rugose-striate and finely reticulate with small punctures *i*=1–4d; scutum and scutellum pit-reticulate with distinct but shallow small punctures *i*=1–3d; propodeal triangle reticulate with weakly scrobiculate peripheral margin; metasomal terga with very few punctures except near prepygidial fimbria.

Redescription of male. Body length: 8.1 mm. Relative head measurements: HW 100; HL 82; UFW 68; LFW 59; FL 165; SL 32.

Inner orbits converge ventrally; mandible bidentate gently curved; clypeus transversely convex; flagellum long with all segments other than first almost twice as long as wide; claws cleft.

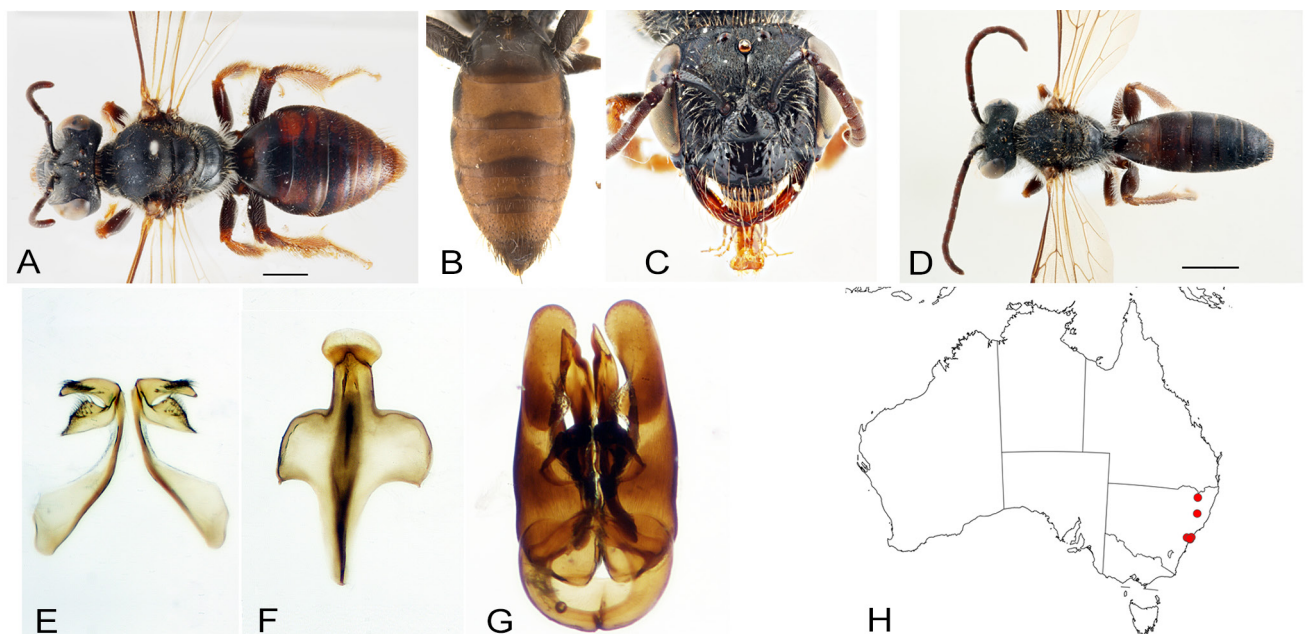


Figure 7. *Leioproctus* (*Euryglossidia*) *australiensis* (Dalla Torre): A, ♀ dorsal view; B, ♀ metasomal colour form; C, ♀ face; D, ♂ dorsal view; E–G, ♂ terminalia ventral views; H, collection locations. Scale bars: A, D, 1 mm; E–G, 500 µm.

Colouration. As for female except metasoma usually darker, sterna paler than terga.

Pubescence. As for female, without scopal hair on legs or metasomal sterna, except long setae on scutum and scutellum weakly branched and lateral hair on mesosoma somewhat longer.

Sculpture. As for female except lower face distinctly reticulate but shiny; clypeal punctures small, $i > 4d$; reticulation of frons, scutum and scutellum almost obscures the striae and punctures.

Leioproctus (Euryglossidia) baeckeeae (Rayment, 1948)

Fig. 8

Euryglossa baeckeeae Rayment, 1948: 248.

Leioproctus (Euryglossidia) baeckeeae (Cockerell)—
Michener, 1965: 68.

Holotype. ♂ Bolgart, WA (31.3°S 116.5°E), 3 Sep 1947, R. Erickson, on *Baeckea camphorosmae*, ANIC 32-153430—collector and flower mentioned in original description, not on label; right antenna, left fore and mid legs missing.

Other specimens examined: 1♂, same data as holotype, ANIC; 1♂, Boulder Rock, WA (33.721°S 124.163°E), 14 Aug 1994, T.F. Houston, on *Hakea*, WAM 20819; 2♂ 8♀, Mount Gibson Station, WA (29.7°S 117.3°E), 29 Aug 2001, R. Leijes, on *Acacia & Grevillea*, SAM 32-44746, 56–59, 61, 63, 64, 90, 91; 1♀, 10 km SW Paynes Find, WA (29.29°S 117.59°E), 29 Aug 1981, G.A. Holloway, AMS K.396107; 1♂ 6 km E Merredin, WA (31.480°S 118.330°E), 23 Sep 2005, L. Packer, YUC.

Diagnosis. Small, head and mesosoma black often with weak brassy sheen, metasoma banded orange and brown dorsally, paler ventrally, frons scabrous, scutum reticulate, propodeal triangle without rugae, hair of female hind tibial scopa sparse, sparsely branched posteriorly.

Redescription of male. Body length 5.3 mm. Relative head dimensions: HW 100; HL 78; UFW 68; LFW 55; CL 26; FL 166; SL 24.

Clypeus and supraclypeal area convex; inner orbits ventrally convergent; flagellum long, fl2–fl11 longer than wide; frontal carina extends halfway to median ocellus.

Colouration. Head and mesosoma black except: slight brassy sheen on frons, scutum, scutellum and occasionally clypeus; apex of mandible dark red; flagellum dark brown dorsally, yellow-brown ventrally; tegula transparent amber; all tibiae and distal ends of femora yellow-brown, tarsi darker, remainder of legs dark brown. Metasoma dark-brown dorsally with basal areas of T2–T4 yellow-brown, tergal apical margins transparent, metasomal sterna yellow-brown.

Pubescence. Hair of lower face close, white, tightly-branched, $1 \times \text{MOD}$, semi-adpressed on clypeus and in paraocular areas, erect on lower frons and gena; hair of scutum sparse; sides of mesosoma with open to sparse, white, plumose hair, $3\text{--}4 \times \text{MOD}$; metasomal hair sparse, except extreme (ventrally facing) lateral margins of T2–T4 with open patches of white hair and S4 & S5 with weak apical fringes, $1 \times \text{MOD}$.

Sculpture. Head and mesosoma strongly reticulate, metasoma lineo-reticulate; punctures of clypeus and supraclypeal area small, $i=1\text{--}2d$; frons dulled by a combination of strong reticulation, irregular vertical rugae and small punctures, $i < d$; punctures of scutum and scutellum small, indistinct, $i=1\text{--}2d$; propodeal triangle more coarsely pit-reticulate than elsewhere, anterior ends of peripheral suture with a shallow, wide scrobiculate sulci.

Description of female. Body length 5.6 mm; head width 1.6 mm. Relative head dimensions: HW 100; HL 82; UFW 72; LFW 62; CL 25; FL 68; SL 33.

Clypeus gently convex; inner orbits converging ventrally; flagellum short, segments fl1–9 wider than long; frontal carina extends halfway to median ocellus; inner hind tibial spur with 5 well separated teeth, longer than width of spur; claws simple; length of 1st abscissa of posterior margin of

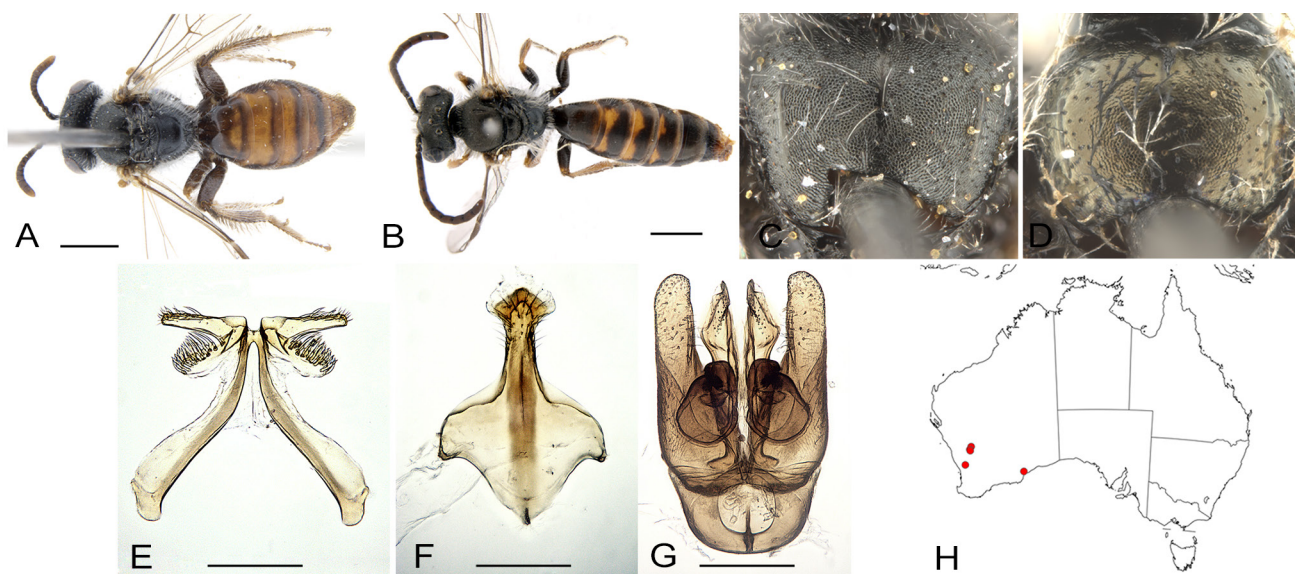


Figure 8. *Leioproctus (Euryglossidia) baeckeeae* (Rayment): A, ♀ dorsal view; B, ♂ dorsal view; C, ♂ scutum; D, ♂ variant scutum; E–G, ♂ terminalia ventral views; H collection locations. Scale bars: A, B, 1 mm; E–G, 200 µm.

second submarginal cell of forewing $0.75\times$ length of first submarginal crossvein.

Colouration. Head and mesosoma black except frons, scutum, scutellum and metanotum with a weak brassy sheen, flagellum dark brown dorsally, ventrally apical two-thirds yellow-brown, mandible dark red apically, amber subapically, tegula transparent amber, anterior faces of tibiae and basitarsi yellow-brown, remainder of legs dark brown. Metasomal T1–T5 orange-brown with diffuse dark brown apical band, T1 with dark suffusion basally, metasomal sterna mostly yellow-brown.

Pubescence. Hair on lower face open, white, tightly-branched, $2\times$ MOD; on scutum open, pale brown, erect, finely branched, $ca\ 1\times$ MOD, interspersed with longer, simple branched setae; hair of hind tibial scopa sparse, white, bipectinate on anterior margin, pectinate medially and brown, unbranched on posterior margin and near basitibial plate.

Sculpture. Clypeal punctures medium to large, $i=1-2d$, with polished or weakly reticulate interspaces; supraclypeal area impunctate except on lateral margins; punctures in paraocular areas small, $i\approx d$, with weakly reticulate interspaces; frons strongly sculptured with a combination of irregular vertical rugae, strong reticulation and small punctures, $i\approx d$; scutum strongly reticulate with indistinct, small punctures, $i=1-3d$; propodeal triangle more coarsely reticulate, peripheral suture indicated by broad, shallow, scrobiculate sulci extending about half way along suture; metasomal terga moderately lineo-reticulate.

Variation. Two male specimens with a reticulate but bright, brassy scutum, seemed initially as though they might have been a separate species, but close examination showed that the only detectable difference was the strength of the reticulation.

Leioproctus (*Euryglossidia*)

bracteatus sp. nov.

urn:lsid:zoobank.org:act:45A15A90-7710-4B19-AC5E-A91A0AF56F7B

Fig. 9

Holotype. ♀ 30 km N Bullfinch, WA (30.715°S 119.114°E), 7 Sep 1979, T.F. Houston *et al.*, on *Grevillea paniculata*, WAM 20742.

Paratype. 1 ♀, collection data as for holotype, WAM 20741.

Diagnosis. Mid-sized, black, scutum iridescent gold, polished between close punctures with close golden brown pubescence, metasoma polished with slight bluish sheen, pygidial plate narrow apically, inner hind tibial spur with 12 teeth half as long as width of shaft.

Description of female. Body length 7.7 mm. Relative head measurements: HW 100; HL 74; UFW 68; LFW 56; CL 29; FL 75; SL 35.

Inner orbits ventrally convergent; clypeus and supraclypeal area transversely convex; mandible bidentate, smoothly curved, upper face moderately wide; frontal carina extends more than half way to median ocellus; flagellum moderately long, all segments except fl2–fl4 as long or longer than wide; inner hind tibial spur with 12 teeth about half as long as width of spur; pygidial plate apically about as wide as MOD; claws with short, triangular basal tooth.

Colouration. Head and mesosoma black with a strong brassy sheen except on lower clypeus, flagellum dark brown dorsally, lighter ventrally, tegulae transparent brown, fore tibia and tarsus yellow-brown with darker suffusions, mid and hind tibiae and tarsi largely darkish brown; mandible with dark red tip and short amber section preapically; metasomal terga dark brown with bluish sheen, sterna brown;

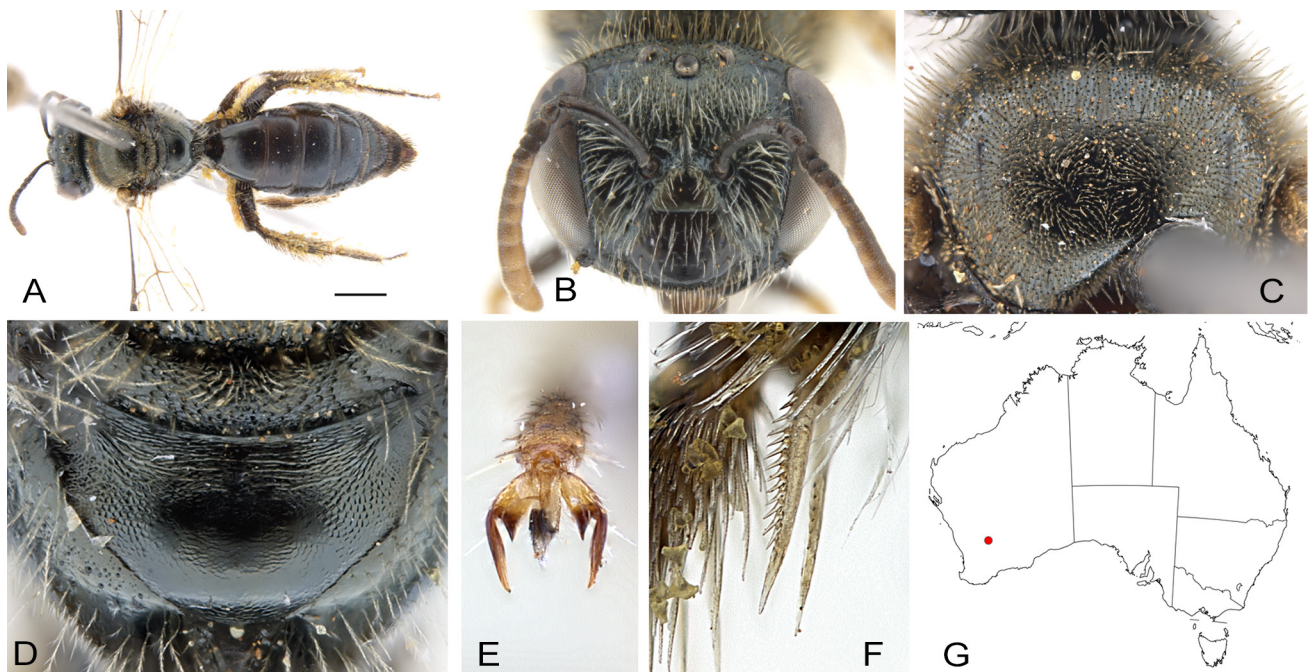


Figure 9. *Leioproctus* (*Euryglossidia*) *bracteatus* sp. nov. ♀: A, dorsal view, scale bar: 1 mm.; B, face; C, scutum; D, propodeal triangle; E, hind claw; F, inner hind tibial spur; G, collection locations.

prepygidial fimbria almost black.

Pubescence. Hair on clypeus sparse, white, finely branched on distal end, $2\times\text{MOD}$; on paraocular areas and lower frons open, white, finely branched along whole length, $2\times\text{MOD}$; on gena similar open hair, $1\times\text{MOD}$; on scutum close, golden brown, tightly branched, $0.5\times\text{MOD}$, interspersed with sparse, dark, weakly branched or simple setae, $1\times\text{MOD}$; hair on mesepisternum open, white, plumose, $2\times\text{MOD}$; hind tibial scopa open to sparse, with white bipectinate hair on anterior margin and dark brown weakly pectinate hair on posterior margin; metasomal terga with sparse hair, except for prepygidial fimbria; metasomal sterna S2–5 with close rows of erect, white, weakly pectinate hair, $2\times\text{MOD}$; S5, S6 with relatively weak apical fringes, $2\times\text{MOD}$.

Sculpture. Punctures on clypeus small, $i=3-4d$, with polished interspaces; anterior face of supraclypeal area polished, impunctate; frons with mid-sized punctures, $i<d$, with reticulate interspaces; punctures of scutum and scutellum small, $i<0.5d$ on scutum, $i=1-4d$ on scutellum; propodeal triangle weakly reticulate with fine transverse striae basally; metasomal terga lineo-reticulate but shiny.

Male. Unknown.

Etymology. The specific epithet is a Latin adjective meaning gilt, referring to the colour of the scutal integument.

Leioproctus (Euryglossidia)

brochellus sp. nov.

urn:lsid:zoobank.org:act:81B3A5A1-929D-4DCD-B816-5481A340BA89

Fig. 10

Holotype. ♂ *ca* 12 km NE Bungalbin Hill, WA (30.290°S 119.687°E), 11–18 Sep 1979, T.F. Houston, on *Commersonia crispata*?, WAM 20752.

Paratypes. 2♀, collection data as for holotype, WAM 20751, 53.

Diagnosis. Small, head and mesosoma black, metasoma brown, female mandible mostly orange, frons striate, scutum shiny with weak reticulation between open or sparse punctures, male face wide ($\text{HL}<70$), clypeus with rectangular medial projection on ventral margin, mandible long, subapical tooth absent, similar to *L. brochus* but scutum reticulate and more closely punctured, female metasoma less hairy.

Description of male. Body length 4.2 mm. Relative measurements: HW 100; HL 68; UFW 68; LFW 64; CL 24; FL 101; SL 27.

Head wide, inner orbits converging slightly ventrally; mandible unidentate, rutellum long with a narrow apical tooth; clypeus with blunt, rectangular projection medio-apically, width of projection $0.12\times$ clypeal width; gena broad, almost as wide as compound eye viewed laterally, without a projecting lobe; claws cleft.

Colouration. Head and mesosoma black, metasoma dark brown dorsally, orange-brown ventrally; mandible black with a short amber preapical section before red tip; flagellum dark brown dorsally, yellow-brown ventrally; legs brown except fore tarsus yellow-brown; tegulae transparent brown.

Pubescence. Other than the scopal hair, similar to female, except hair on face and mesosoma is less dense, scutal hair is sparse, white, $2\times\text{MOD}$ without interspersed dark setae and metasoma has only sparse hair with no fringes on S5,6.

Sculpture. Clypeal punctures small, $i\approx d$, with reticulate interspaces; frons finely striate without noticeable punctures; scutum with sparse, small punctures, $i=4-10d$, interspaces with reticulation strong near anterior and posterior margins, weaker medially; propodeal triangle reticulate, peripheral suture weak; metasomal terga lineo-reticulate, T1, T2 dull, remaining terga moderately shiny.

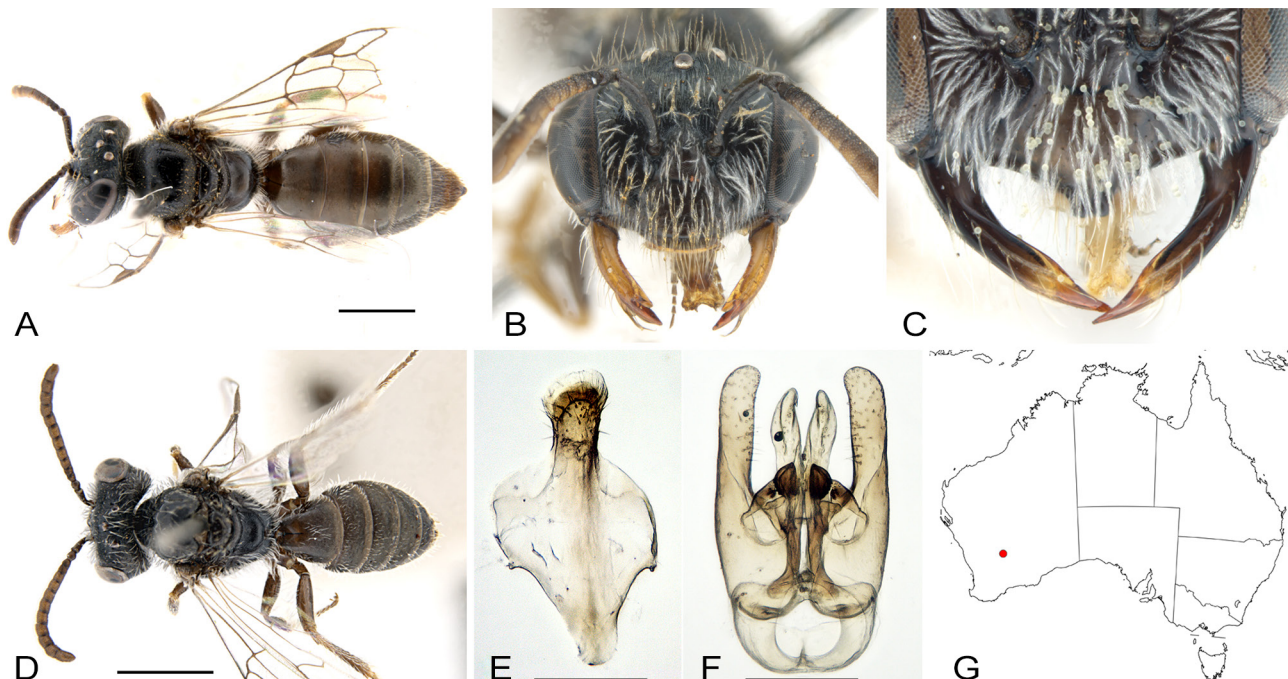


Figure 10. *Leioproctus (Euryglossidia) brochellus* sp. nov.: A, ♀ dorsal view; B, ♀ face; C, ♂ clypeus; D, ♂ dorsal view; E, ♂ S8 ventral view; F, ♂ genital capsule ventral view; G, collection locations. Scale bars: A, D, 1 mm; E, F, 200 μm .

Description of female. Body length *ca* 5.5 mm. Relative head measurements: HW 100; HL 73; UFW 67; LFW 62; CL 26; FL 69; SL 30.

Inner orbits gently convergent ventrally, head short; mandible bidentate, smoothly curved; clypeus longitudinally and transversely convex; flagellum short, all segments other than first and last wider than long; width of gena *ca* $\frac{2}{3}$ of width of compound eye viewed laterally; inner hind tibial spur with *ca* 6 fine teeth about half as long as width of spur; claws simple.

Colouration. Head black except clypeus and supraclypeal area brown; mesosoma black, metasoma mid to dark brown dorsally, somewhat lighter ventrally; mandible and labrum yellow-brown, mandible with dark red tip; flagellum dark brown dorsally, yellow-brown ventrally; legs brown except anterior face of fore tibia tarsus yellow-brown; tegulae transparent brown.

Pubescence. Hair on clypeus, paraocular areas and lower frons open, white, closely-branched, *ca* $2 \times \text{MOD}$; scutal hair sparse, with tightly-branched pale hair, $0.5 \times \text{MOD}$, around periphery and sparse, weakly branched, dark brown setae, $1.5 \times \text{MOD}$, over whole surface; sides of mesosoma with open, white, openly-branched hair, $2 \times \text{MOD}$; hair of hind tibial scopa open, white, bipectinate anteriorly becoming almost simple, transparent brown posteriorly; metasomal terga T4–6 with sparse, brown, almost simple hair merging into open, dark brown fimbria; metasomal sterna S2–4 with open rows of erect, white, weakly branched hair, S5 with dense, white apical fringe.

Sculpture. As for male except scutum with small punctures, $i=1-4d$.

Etymology. The specific epithet is a Latin adjective that is the diminutive of *brochus*, the name applied to the only other currently known species with a rectangular tooth on the male clypeus.

Leioproctus (*Euryglossidia*)

brochus sp. nov.

urn:lsid:zoobank.org:act:57C900B8-9D04-47C9-A14C-C54F25165F09

Fig. 11

Holotype. ♂ Lochada, WA (29.095°S, 116.547°E), 17 Sep 2009, R. Leijs, on *Calycopephus paucifolius*, SAM 32-40064.

Paratype. 1 ♀, collection data as for holotype, SAM 32-40065.

Diagnosis. Small, head and mesosoma black, metasoma brown, mandible mostly yellow (female) or amber (male), frons striate, scutum polished, sparsely punctate, male face wide ($\text{HL} < 70$), clypeus with rectangular medial projection on ventral margin, mandible long, subapical tooth absent, female metasomal T3–6 with adpressed white pubescence, similar to *L. brochellus* but female metasoma distinctly hairy, scutum polished and more sparsely punctured.

Description of male. Body length *ca* 5.1 mm. Relative measurements: HW 100; HL 60; UFW 66; LFW 63; CL 27; FL 85; SL 27.

Head wide, inner orbits slightly convergent ventrally; mandible unidentate, gently curved at end of acetabular groove (*ca* $0.2 \times$ length from base), rutellum very long with a narrow apical tooth; clypeus with blunt, rectangular projection medio-apically, width of projection $0.12 \times$ clypeal width; gena broad, almost as wide as compound eye viewed laterally, with blunt lobe on ventro-posterior corner; claws cleft.

Colouration. Head and mesosoma black, metasoma dark brown dorsally, orange-brown ventrally; basal half of mandible black, apical half pale amber with dark red tip, flagellum dark brown dorsally, bright orange ventrally; legs brown except tarsi and anterior face of fore tibia yellow; tegulae transparent brown.

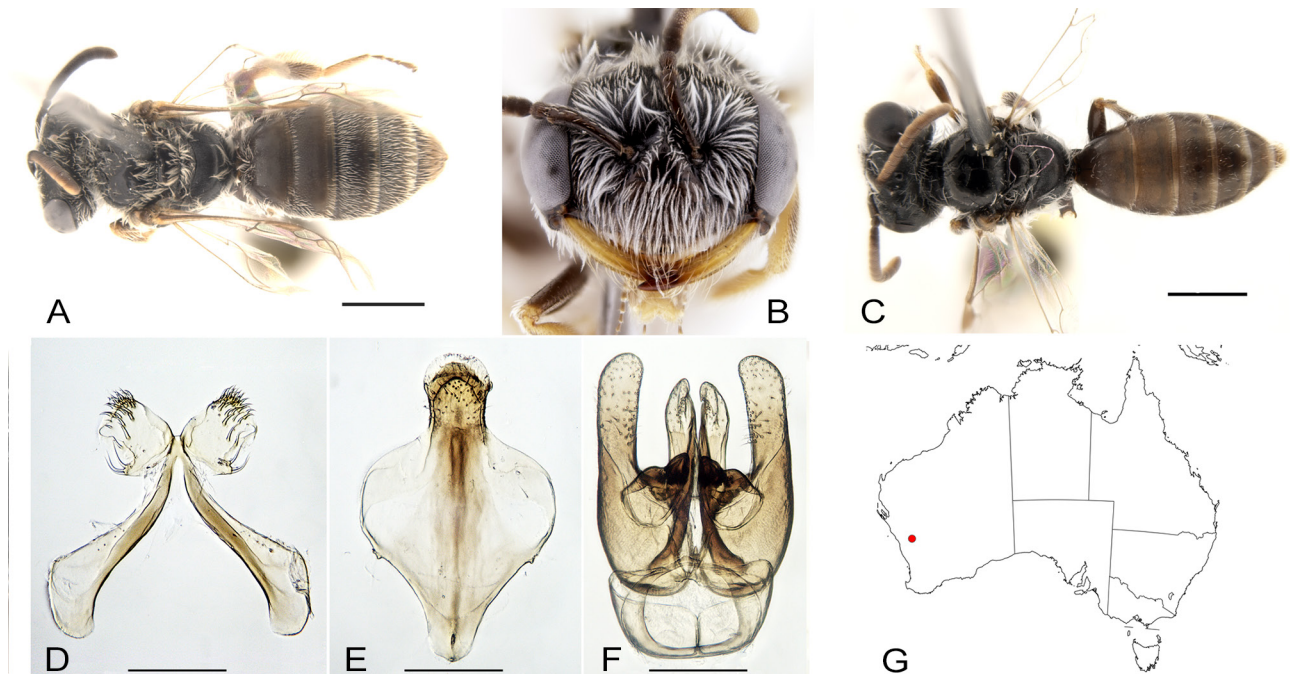


Figure 11. *Leioproctus* (*Euryglossidia*) *brochus* sp. nov.: A, ♀ dorsal view; B, ♀ face; C, ♂ dorsal view; D–F, ♂ terminalia ventral views; G, collection locations. Scale bars: A, C, 1 mm; D–F, 200 μm .

Pubescence. Long white, densely-branched hair $ca\ 2\times MOD$ is openly distributed over the lower face, with similar but shorter hair on upper frons, gena and vertex; scutum with sparse hair; sides and venter of mesosoma with plumose, white hair, $\leq 3\times MOD$; metasomal terga T3–5 and T2 laterally with open, adpressed, tightly-branched hair.

Sculpture. Punctures on clypeus, lateral faces of supraclypeal area and lower paraocular areas small, sparse with polished interspaces; frons finely striate with small punctures, $i=1-2d$; scutum and scutellum with sparse, tiny punctures and reticulate interspaces; propodeal triangle reticulate, peripheral suture weak; metasomal punctures shallow, mostly obscured by pubescence and lineo-reticulation.

Description of female. Body length $ca\ 5.1$ mm. Relative measurements: HW 100; HL 70; UFW 69; LFW 65; CL 25; FL 66; SL 31.

Inner orbits parallel, head short; mandible bidentate, smoothly curved; clypeus longitudinally and transversely convex; flagellum short, all segments other than first and last wider than long; width of gena $ca\ 2/3$ width of compound eye viewed laterally; inner hind tibial spur with $ca\ 6$ fine teeth about half as long as width of spur; claws simple.

Colouration. Head black, mesosoma black dorsally, dark brown ventrally, metasoma mid-brown dorsally, orange-brown ventrally; mandible bright orange with red tip, flagellum dark brown dorsally, yellow ventrally; legs brown except basitarsi, anterior face of fore tibia and hind basitibial plate yellow; tegulae transparent brown.

Pubescence. Semi-adpressed long white, densely-branched hair $ca\ 2\times MOD$ is closely and evenly distributed over the lower face, with similar but shorter hair on upper frons, gena and vertex; scutum and margins of scutellum with tightly-branched short hair; sides and venter of mesosoma with plumose, white hair, $\leq 3\times MOD$; metasomal terga T3–5 and T2 laterally with open, adpressed, tightly-branched hair; hind tibial scopa open, with white, bipectinate hair anteriorly becoming brown, pectinate posteriorly with a few simple brown setae near the basitibial plate; apical $1/4$ of metasomal sterna S2–5 with erect, white, weakly-branched hair, $3-4\times MOD$; S5, S6 with dense white apical fringes.

Sculpture. As for male except punctures on clypeus, lateral faces of supraclypeal area and lower paraocular areas large, dense with polished interspaces.

Etymology. The specific epithet is a Latin adjective meaning projecting, referring to the rectangular tooth on the male clypeus.

Leioproctus (Euryglossidia)

brunneipilosus sp. nov.

urn:lsid:zoobank.org:act:66CE2339-42A0-4C17-A3A9-37DF39EF8C9E

Fig. 12

Holotype. ♂ Mount Colah, NSW (33.676°S 151.135°E), 23 Aug 2004, M. Batley, on *Boronia ledifolia*, AMS K.361071.

Paratypes. 3♀ 6♂, Mount Colah, NSW (33.676°S 151.135°E), 23–27 Aug 2004, M. Batley, on *Boronia ledifolia*, AMS K.361072–76, 81–84.

Other specimens examined: 7♂, Mount Colah, NSW (33.676°S 151.135°E), 15 Aug 2005 & 26 Aug 2011, M. Batley, on *Boronia ledifolia* & *Grevillea buxifolia*, AMS K.224598–600; K.345833–35; 6♂, Marramorra NP, NSW (33.56°S 151.10°E), 29 Aug 1998, 10 & 21 Aug 2002, M. Batley, on *Boronia ledifolia*, *Eriostemon australasius* & *Zieria laevigata*, AMS K.182674–9, K.593232–27; 4♂, Nadgee Reserve, 6 km S Newtons Beach, NSW (37.43°S 149.95°E), 9 Sep 1985, R.W. Thorp, AMS K.396051, 52, K.95569, 70; 10♂, Turramurra, NSW (33.686°S 151.160°E), 28 Aug 2005 & 30 Aug 2017, M. Batley, *Boronia pinnata* & *Grevillea linearifolia*, AMS K.360548–55, K.517357, 58.

Diagnosis. Small, head and mesosoma black, metasoma dark brown (female) or banded orange and dark brown (male), tibiae and tarsi orange-brown with brown infuscation, frons densely punctate, propodeal triangle without rugae, female scutum densely punctate with dark golden-brown pubescence, hair of hind tibial scopa open.

Description of male. Body length $ca\ 5.4$ mm. Relative head measurements: HW 100; HL 80; UFW 69; LFW 54; CL 28; FL 145; SL 29.

Head with inner orbits converging ventrally; mandible bidentate, smoothly curved.

Colouration. Head and mesosoma black, metasomal T1 dark brown, T2–4 dark brown medially and orange-brown basally and apically, T5, T6 black (occasionally T5 orange-brown basally), tarsi and tibiae orange-brown with darker infusions; mandible brown with dark red tip; flagellum dark brown dorsally, dull orange-brown ventrally; tegulae transparent brown.

Pubescence. Hair on clypeus, lower paraocular areas and lower frons open white, plumose, $2\times MOD$, interspersed on clypeus with longer simple setae; hair on gena close, $1-2\times MOD$; hair on vertex weakly-branched, erect, $ca\ 2\times MOD$; scutal and scutellar hair sparse, erect, weakly-branched and long, $1.5-2\times MOD$; hair on mesothorax laterally, plumose, white, $\leq 3\times MOD$; hair on metasomal terga sparse, short, simple, lateral margins of T2–T4 with a little adpressed white hair; hair on metasomal sterna sparse apart from apical fringes on S4 & S5.

Sculpture. As for female except clypeus, scutum and scutellum weakly reticulate, punctures of clypeus, lower paraocular areas and scutum mid-sized, $i=1-2d$, and facial fovea not indicated by change of sculpture.

Description of female. Body length $ca\ 6.5$ mm. Relative head measurements: HW 100; HL 82; UFW 68; LFW 61; CL 28; FL 73; SL 32.

Head with inner orbits gently convergent ventrally; mandible bidentate, smoothly curved, with prominent outer ridge; clypeus longitudinally weakly convex medially, strongly convex near ventral margin; flagellum short, segments fl2–fl7 wider than long; gena about half as wide as compound eye viewed laterally; inner hind tibial spur with 4–6 oblique teeth longer than width of spur.

Colouration. As for male except metasoma black or dark brown, sometimes darker on apical half.

Pubescence. Hair on clypeus, lower paraocular areas and lower frons open white, plumose, $2\times MOD$, interspersed on clypeus with longer simple setae; hair on gena close, $1-2\times MOD$; hair on vertex weakly-branched, erect, $ca\ 2\times MOD$; scutal and scutellar hair close, semi-adpressed, golden brown, $\sim 1\times MOD$, interspersed with sparse, longer

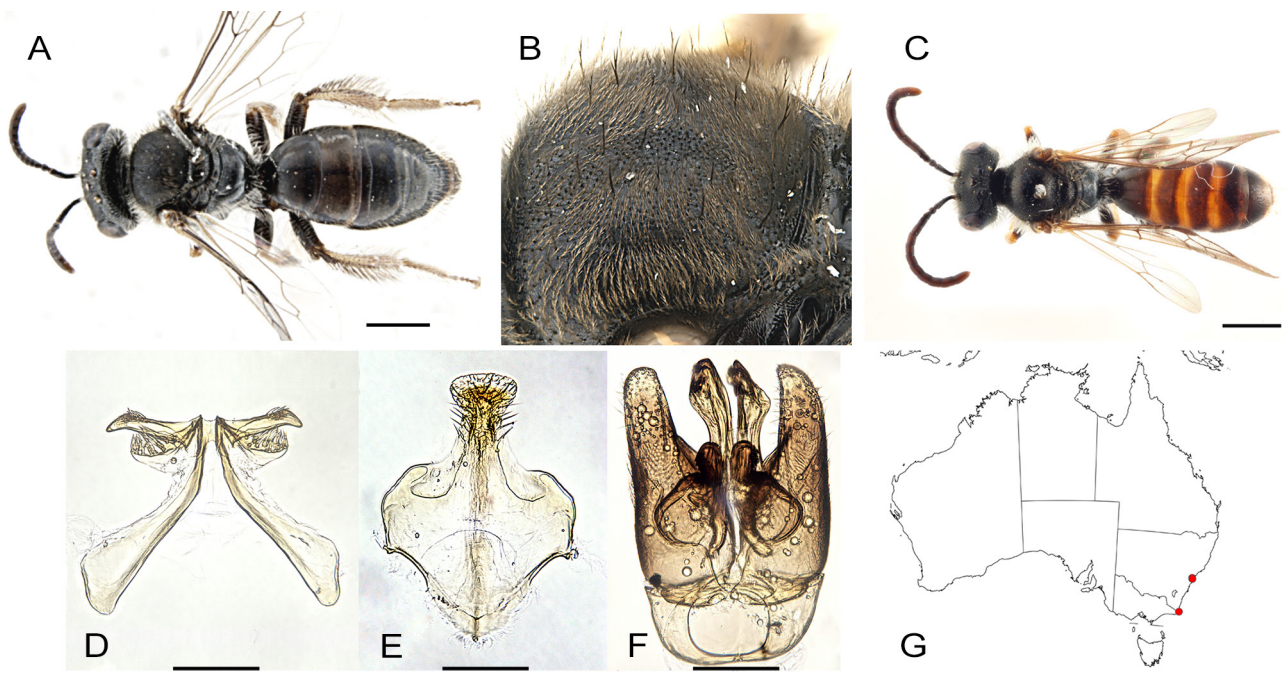


Figure 12. *Leioproctus* (*Euryglossidia*) *brunneipilosus* sp. nov.: A, ♀ dorsal view; B, ♀ scutum; C, ♂ dorsal view; D–F, ♂ terminalia ventral views; G, collection locations. Scale bars: A, C, 1 mm; D–F, 200 µm.

dark brown hairs; hair on mesothorax laterally, plumose, white, $\leq 3 \times \text{MOD}$; hair of hind tibial scopa open, pale brown on anterior margin becoming darker and less closely branched towards rear; hair on metasomal terga sparse, short, simple except prepygidial fimbria tightly branched, dark brown; apical half to one third of metasomal sterna S2–5 with pale erect hair, $2\text{--}3 \times \text{MOD}$; S5, S6 with dense, golden-brown apical fringes.

Sculpture. Head and mesosoma polished, clypeus and lower paraocular areas with strong, mostly small punctures, $i=5\text{--}10d$, with a few larger ones; frons densely punctate to areolate; punctures of scutum and scutellum small, dense, $i \leq d$; propodeal triangle reticulate with indistinct, fine transverse striae basally, peripheral suture indistinct; metasomal terga lineo-reticulate but shining, sterna reticulate.

Etymology. The specific epithet is a Latin adjective derived from words for brown and hairy and referring to the tomentum on the female scutum.

Leioproctus (*Euryglossidia*)

caesicitus sp. nov.

urn:lsid:zoobank.org:act:F5DCFFFE-E7ED-4D04-B63D-521EC43E8952

Fig. 13

Holotype ♀ Badgingarra NP, WA (30.365°S 115.481°E), 10 Oct 2005, L. Packer, AMS K.396337.

Paratypes. 5♀, collection data as for holotype, 1♀ in AMS K.396338, 4♀ in YUC.

Diagnosis. Head and mesosoma black, metasoma black or dark brown with translucent tergal apical margins, scutum openly punctate with polished interspaces, propodeal triangle striate to end of subhorizontal area, frons indistinctly striate,

distinguished from *striatulus* by wide face ($\text{HL} < 75$) and reticulation on T1, and from *mutabilis* by the polished interspaces on the clypeus and supraclypeal area.

Description of female. Body length *ca* 6.5 mm. Relative measurements: HW 100; HL 72; UFW 70; LFW 59; CL 26; FL 69; SL 28.

Inner orbits ventrally convergent; mandible bidentate, smoothly curved; clypeus convex; frontal carina not quite reaching median ocellus; flagellum short, segments fl1–fl9 shorter than wide; gena almost as wide as compound eye viewed laterally; inner hind tibial spur with *ca* 11 fine teeth, as long as width of spur medially, tapering to half as long towards either end; claws with sharp medial inner tooth.

Colouration. Head and mesosoma black except frons with a slight brassy sheen, metasoma predominantly dark brown with steel blue sheen on some terga, tergal apical margins distinctly bronze; sterna mostly mid-brown; legs dark brown; flagellum dark brown dorsally, mostly dull yellow-brown ventrally; mandible dark red apically with a short preapical region amber; prepygidial fimbria mid to dark brown.

Pubescence. Hair of clypeus, paraocular areas, lower frons and gena open, white, closely branched, $1\text{--}2 \times \text{MOD}$; hair of mesepisternum white, plumose, $2 \times \text{MOD}$; hair of hind tibial scopa white, open, bipectinate on anterior edge, pectinate elsewhere; hair on metasomal terga sparse, except for prepygidial fimbria; hair of sterna S2–S5 white, open, erect, weakly-branched, $2\text{--}3 \times \text{MOD}$; apical fringes of S5, S6 dense, $2 \times \text{MOD}$; lateral (ventrally facing) margins of T3–T5 with some adpressed white hair, $2 \times \text{MOD}$.

Sculpture. Punctures on clypeus, lower paraocular area and lateral surface of supraclypeal area mid-sized, $i < d$, with polished, weakly reticulate interspaces; frons with dense, small, $i < d$, with reticulate interspaces; punctures of scutum and scutellum small, $i=2\text{--}4d$, with polished interspaces; propodeal triangle with fine rugae radiating from central line of triangle; punctures of metasomal terga small, sparse, mostly obscured by reticulation.

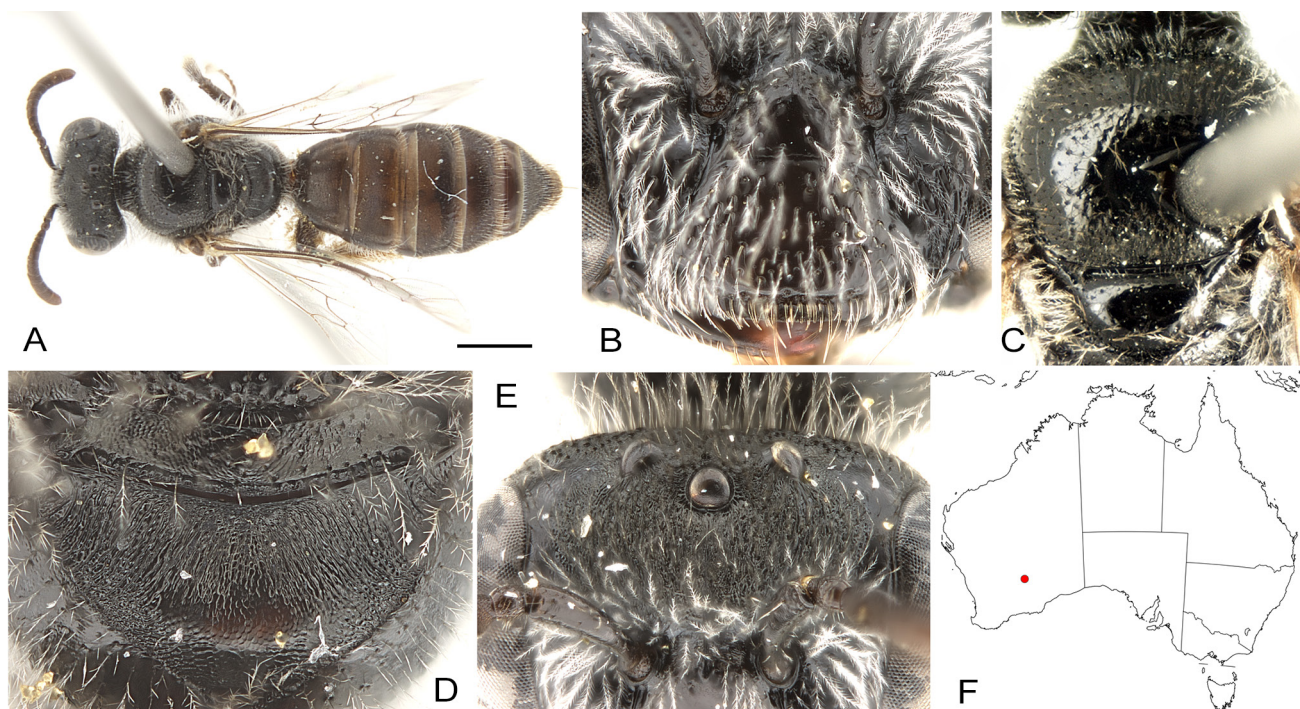


Figure 13. *Leioproctus (Euryglossidia) caesicitus* sp. nov. ♀: A, dorsal view, scale bar 1 mm; B, clypeus; C, scutum; D, propodeal triangle; E, frons; F, collection locations.

Variation. The strength of the radiating rugae on the propodeal triangle is variable with reticulation occasionally dominating.

Male. Unknown.

Etymology. The specific epithet is a Latin adjective meaning bluish, referring to the slight iridescent tint on parts of the metasoma.

Leioproctus (Euryglossidia)

calvus sp. nov.

urn:lsid:zoobank.org:act:F2099265-B598-4B5D-A039-E2C9E75149E6

Fig. 14

Holotype. ♂ Cranmore Park, WA (30.60°S 116.29°E), 19 Aug 1933, Fuller, ANIC.

Paratypes. 1♂, collection data as for holotype—metasoma missing, ANIC; 1♂, Guildford, WA (31.90°S 115.97°E), 1915, ANIC.

Diagnosis. Mid-sized, head, mesosoma and metasoma black with brassy sheen, ocellocular area depressed, tibiae and tarsi infuscated orange-brown, distinguished from *vitrifrons* and *chrysopsis* by the absence of sternal hair apart from medial patch on S6 and from *heterodoxus* by the unmodified hind leg.

Description of male. Body length 7.5 mm. Relative head measurements: HW 100; HL 81; UFW 67; LFW 52; CL 30; FL 187; SL 29.

Vertex elevated well above top of eyes; ocellocular and upper paraocular areas strongly depressed; inner orbits converging ventrally; clypeus and supraclypeal area gently convex; frontal carina extends $\frac{1}{3}$ of way to median ocellus;

mandible bidentate, with strong outer ridge; flagellum long, segments fl3–fl10 twice as long as wide; mid basitarsus not expanded; hind tarsus longer than hind tibia, with relative length of tarsal segments 100:33:17:11:23; claws cleft.

Colouration. Black with a brassy sheen, except flagellum, coxae, trochanters and most of femora dark brown, tibiae and basitarsi orange brown with dark brown suffusions, remainder of tarsi dark brown, wings with slight brownish tint.

Pubescence. Hair of clypeus and lower paraocular areas adpressed, dense, flattened, pale gold, $2\times\text{MOD}$; fringe on lower margin of mandible dense, white, $3\times\text{MOD}$; gena with ventral beard of white hair, $4\text{--}5\times\text{MOD}$; hair on scutum and scutellum open, brown, sparsely branched, $2\times\text{MOD}$; on sides of mesosoma open, white, plumose, *ca* $3\times\text{MOD}$; metasoma with sparse, mostly simple hair, S5 apically and S6 medially with open erect, simple hair, $1\text{--}2\times\text{MOD}$.

Sculpture. Punctures on clypeus small, $i\approx d$, with reticulate interspaces; front face of supraclypeal area reticulate, impunctate; frons roughly sculptured with irregular vertical rugae and reticulation; scutum and scutellum with strong reticulation obscuring small punctures; propodeal triangle reticulate and shiny with anterior half of peripheral suture marked by a wide, scrobiculate sulcus; metasoma strongly lineo-reticulate.

Female. Unknown.

Etymology. The specific epithet is a Latin adjective indicating that the metasomal sterna are almost bald.

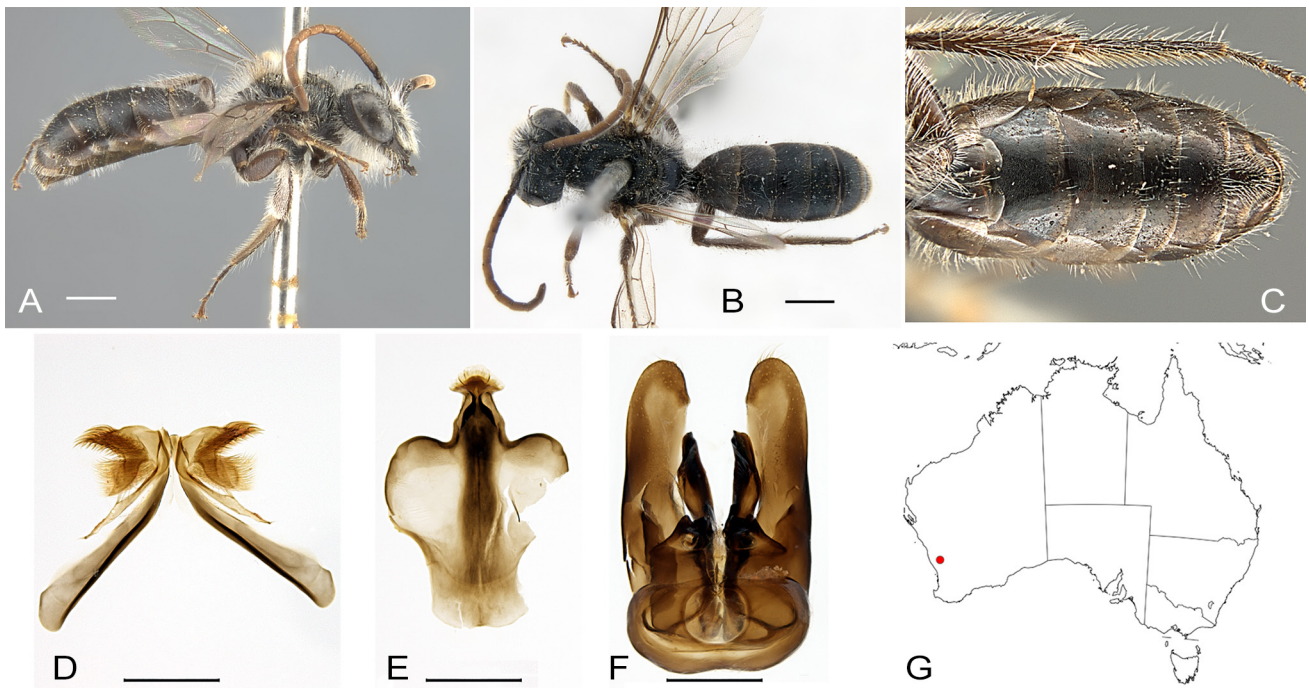


Figure 14. *Leioproctus* (*Euryglossidia*) *calvus* sp. nov. ♂: A, lateral view; B, dorsal view; C, metasoma ventral view; D–F, ♂ terminalia ventral views; G, collection locations. Scale bars: A, B, 1 mm; D–F, 500 μ m.

Leioproctus (*Euryglossidia*)
chrysoptis sp. nov.

urn:lsid:zoobank.org:act:E05D1AB7-2FE2-4059-949B-E3D901428CF2

Fig. 15

Holotype. ♂ 6 km ENE Warriendar, WA (29.113°S 117.242°E), 27 Aug 1981, T.F. Houston, on *Hakea preissii*, WAM 10585.

Paratypes. 5♂ 5♀ same collection data as holotype, WAM 10583–84, 86–93; 4♂, Mount Gibson Station, 93km NE Wubin, WA (29.72°S 117.17°E), 21–29 Aug 2001, R. Leys, SAM 32-44765–8; 1♂ 13 km NE Warriendar, WA (29.051°S 117.280°E), 28 Aug 1981, T.F. Houston, on *Hakea preissii*, WAM 10582; 2♂ 5 km SE Thundelarra, WA (28.925°S 117.165°E), 29 Aug 1981, T.F. Houston, on *Hakea preissii*, WAM 10594, 95; 4♂ 62 km E Hyden, WA (32.450°S 119.570°E), 4 Oct 1978, T.F. Houston & R. How, on *Hakea coriacea*, WAM 20743–46; 2♂ 7.5 km WSW Lake Cronin, WA (32.413°S 119.689°E), 19–26 Sep 1978, T.F. Houston *et al.*, on *Grevillea erectiloba*, WAM 20847, 48; 1♂ 75 km E Hyden, WA (32.450°S 119.709°E), 24–27 Oct 1985, T.F. Houston, on *Grevillea teretifolia*, WAM 20827.

Diagnosis. Large, weakly iridescent, male with depressed ocellular areas, female mesosoma laterally weak iridescent blue, male tibiae and tarsi orange, female legs dark brown or black, males distinguished from *calvus* by size and presence of sternal hair tufts, from *vitrifrons* by colour of clypeal hair and stronger sternal hair tufts, and from *heterodoxus* by the unmodified hind leg.

Description of male. Body length 7.7 mm. Relative head measurements: HW 100; HL 85; UFW 69; LFW 56; CL 32; FL 168; SL 32.

Inner orbits convergent ventrally; clypeus strongly convex; supraclypeal area raised with flat, triangular anterior face and distinct dorsolateral surfaces; ocellular area strongly depressed; ocelli raised well above surrounding areas; frontal carina extending 0.7×distance to median ocellus; mandible bidentate, smoothly curved; flagellum long, all segments longer than wide; gena slightly narrower than compound eye viewed laterally; metasomal sterna boat-shaped with pairs of hair tufts on S3, S4.

Colouration. Iridescent blue with brassy sheen, except tibiae and tarsi orange brown with dark brown suffusions, flagellum dark brown, wings with brownish tint.

Pubescence. Clypeus and lower paraocular areas densely covered with adpressed, iridescent gold hair, 1.5×MOD; hair on lower frons and adjacent paraocular areas erect, close, pale gold, tightly branched, 2×MOD; gena with a beard of similar pale gold hair, 4–5×MOD; scutal hair open, pale golden-brown, finely branched, 2–3×MOD; hair on mesepisternum, almost simple, 4×MOD; metasomal terga T1, T2 with sparse, erect, off-white hair sparse, 2×MOD; S3, S4 with a tuft of stiff white setae either side of mid-line.

Sculpture. Clypeus with dense, very small punctures, $i < 0.5d$; anterior face of supraclypeal area impunctate, polished, dorsolateral faces with small punctures and reticulate interspaces, $i = 0.5d$; frons with strong vertical rugae that largely obscure small to medium punctures with reticulate interspaces; scutum and scutellum strongly reticulate with indistinct small punctures, $i = 2–3d$; propodeal triangle reticulate with anterior half of peripheral suture forming a very wide but shallow scrobiculate sulcus; metasomal terga dulled by moderately strong lineo-reticulation.

Description of female. Body length 10.5 mm. Relative head measurements: HW 100; HL 80; UFW 71; LFW 61; CL 36; FL 84; SL 37.

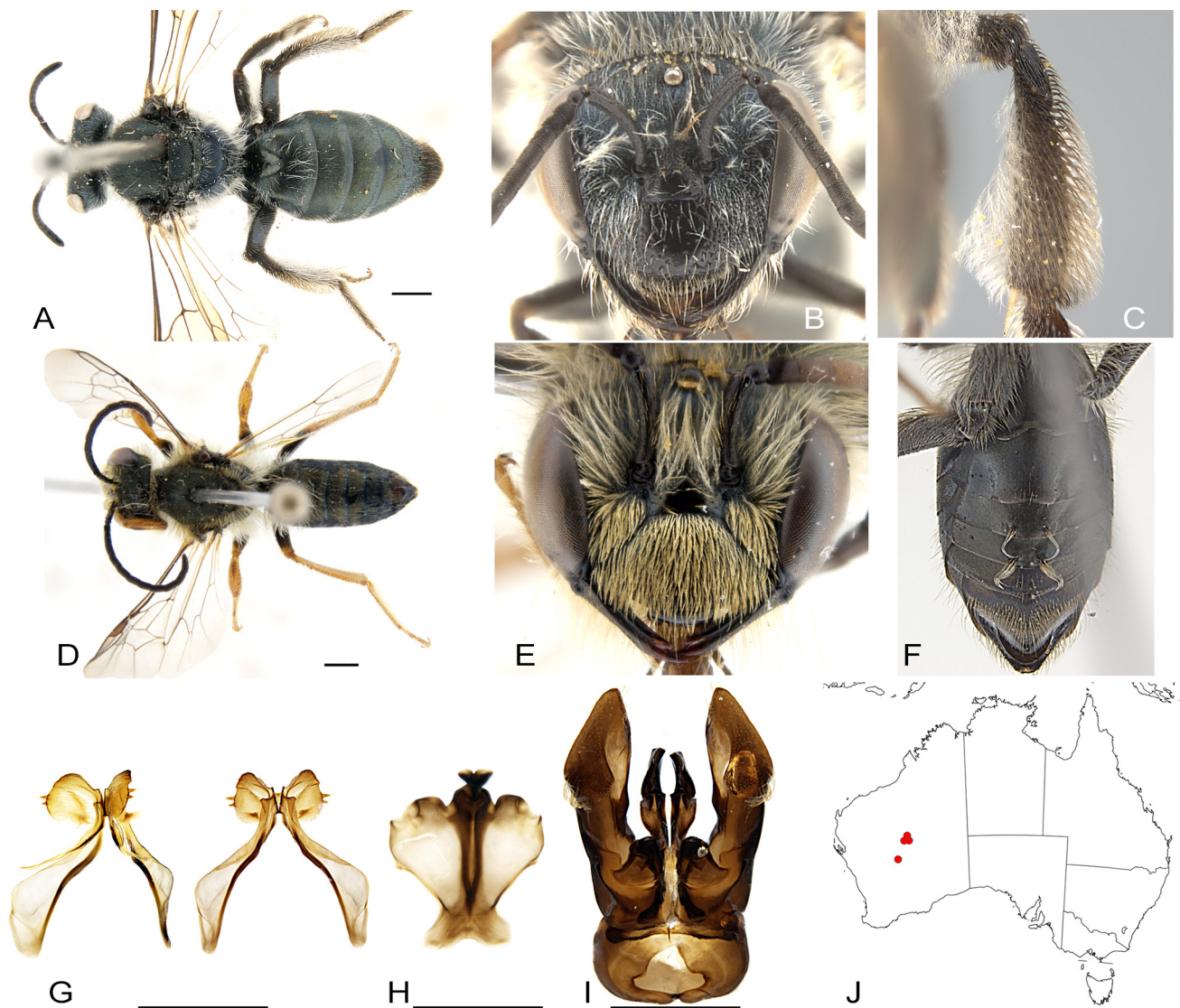


Figure 15. *Leioproctus (Euryglossidia) chrysopsis* sp. nov.: A, ♀ dorsal view; B, ♀ face; C, ♀ hind tibial scopa; D, ♂ dorsal view; E, ♂ face; F, ♂ metasoma ventral view; G, ♂ S7 oblique and ventral views; H, ♂ S8 ventral view; I, ♂ genital capsule ventral view; J, collection locations. Scale bars: 1 mm.

As for male except metasomal sterna not raised medially, inner hind tibial spur with 4 widely spaced curved teeth about twice as long as the width of the shaft.

Colouration. Frons, paracocular areas and whole mesosoma iridescent blue, legs dark brown, wings with brownish tint, metasomal terga black with a greenish iridescent sheen.

Pubescence. Clypeus with sparse simple setae, $1.5 \times \text{MOD}$, paracocular areas and lower frons with close, openly branched white hair, $2 \times \text{MOD}$; gena with open weakly branched white hair, $3 \times \text{MOD}$; scutal hair open, pale brown, finely branched, $0.5 \times \text{MOD}$, interspersed with dark simple setae, $2 \times \text{MOD}$; hair on mesepisternum white, open, $4 \times \text{MOD}$; hind tibial scopa with white bipectinate hair on anterior margin, close, dark brown, pectinate hair medially and brown, weakly branched pectinate hair on posterior margin; apical half of metasomal S2–S5 with sparsely branched stiff white hairs, $2\text{--}3 \times \text{MOD}$; prepygidial fimbria dense, dark brown.

Sculpture. Clypeal punctures vary from small, $i < 0.5d$ near basal and lateral margins to medium, $i = 4d$, apicomediaally,

interspaces polished; frons reticulate with strong small to medium punctures, $i \approx 0.5d$; scutum and scutellum strongly reticulate obscuring punctures; propodeal triangle reticulate, basally with short, irregular, longitudinal rugae, anterior third of peripheral suture forming a very wide but shallow scrobiculate sulcus.

Etymology. The specific epithet is a Latinised adjective based on Greek words for golden appearance referring to the clypeal pubescence of the male.

Leioproctus (Euryglossidia)

chrysopyga sp. nov.

urn:lsid:zoobank.org:act:99F0F14C-DA92-4570-8D66-B3CC37D58333

Fig. 16

Holotype ♂ 7 km N Wongawol, WA (26.06°S 121.94°E), 29–30 Jul 1983, T.F. Houston & R.P. McMillan, on *Calotris multicaulis*, WAM 11209.

Paratypes. 1♀ 9♂, collection data as for holotype, WAM 11203–8, 10–13.

Other specimens examined: 2♂, 37 km SW Glenayle, WA (25.474°S 121.771°E), 8–9 Aug 1983, T.F. Houston & R.P. McMillan, on *Helipterum charsleyae*, WAM 11214, 5; 1♂, 30 km NW Lorna Glen, WA (26.037°S 121.346°E), 10 Aug 1983, T.F. Houston & R.P. McMillan, WAM 11216; 1♂, 33 km WSW Leinster, WA (28.035°S 120.384°E), 11 Aug 1983, T.F. Houston & R.P. McMillan, on *Acacia*, WAM 11217.

Diagnosis. Small, head and mesosoma black, metasoma black with translucent tergal margins, frons reticulate with small close punctures, $i \approx d$, female prepygidial fimbria pale orange, hind basitibial plate with golden setae, male with dense, adpressed white hair below antennal sockets, except in supraclypeal area, very like *recurvatus* but from WA, female has slightly longer flagellum, male mid basitarsus straight not recurved.

Description of male. Body length 4.9 mm. Relative head measurements: HW 100; HL 74; UFW 64; LFW 50; CL 30; FL 122; SL 27.

Inner orbits strongly convergent ventrally, clypeus transversely convex, frontal carina extends $\frac{1}{4}$ of way to median ocellus; flagellum of moderate length, segments fl3–fl11 about as long as wide; mid basitarsus straight, about $\frac{3}{4}$ as long as mid tibia.

Colouration. Head and mesosoma black except flagellum dark brown dorsally, lighter brown ventrally, mandible black with dark red tip, tegulae transparent yellow-brown, legs mostly brown with fore tibia and all basitarsi yellow-brown or orange-brown, metasoma dark brown.

Pubescence. Clypeus and paraocular areas with dense, adpressed, tightly branched, white hair, $1 \times \text{MOD}$; scapes

with open cover of erect, white, tightly branched hair; hair on scutum sparse, erect, white, minutely branched, $2 \times \text{MOD}$; hair on metasoma sparse apart from weak apical fringes on S4, S5.

Sculpture. Clypeal punctures small, $i \leq d$, with reticulate interspaces; supraclypeal area reticulate, impunctate; frons irregularly roughened by a combination of punctures and reticulation; scutum and scutellum strongly reticulate with small punctures, scutum impunctate medially, $i = 2d$ towards margins; propodeal triangle more coarsely reticulate, peripheral suture indicated by a shallow, but moderately wide, scrobiculate sulcus.

Description of female. Body length 5.2 mm. Relative head measurements: HW 100; HL 76; UFW 70; LFW 60; CL 23; FL 70; SL 30.

Inner orbits convergent ventrally; clypeus and supraclypeal area gently convex; mandible bidentate, smoothly curved; frontal carina extends less than half way to median ocellus; flagellum short, segments fl2–fl9 shorter than wide; inner hind tibial spur with *ca* 5 teeth longer than width of spur; claws with sharp subapical tooth.

Colouration. Head and mesosoma black except flagellum dark brown dorsally, yellow-brown ventrally, mandible red-brown with dark red tip, tegulae transparent yellow-brown, legs mostly brown with fore tibia yellow-brown or orange-brown, metasoma dark brown dorsally with T5 apically and T6 yellow-brown, metasoma ventrally orange-brown with large black medial areas on S2, S3.

Pubescence. Hair on clypeus and lower paraocular areas close to dense, white, densely branched, $1 \times \text{MOD}$; on scutum open to sparse, erect, pale brown, minutely branched, *ca* $1 \times \text{MOD}$; on mesepisternum open, white, closely branched, $1 \times \text{MOD}$; hair of hind tibial scopa close, white, bipectinate

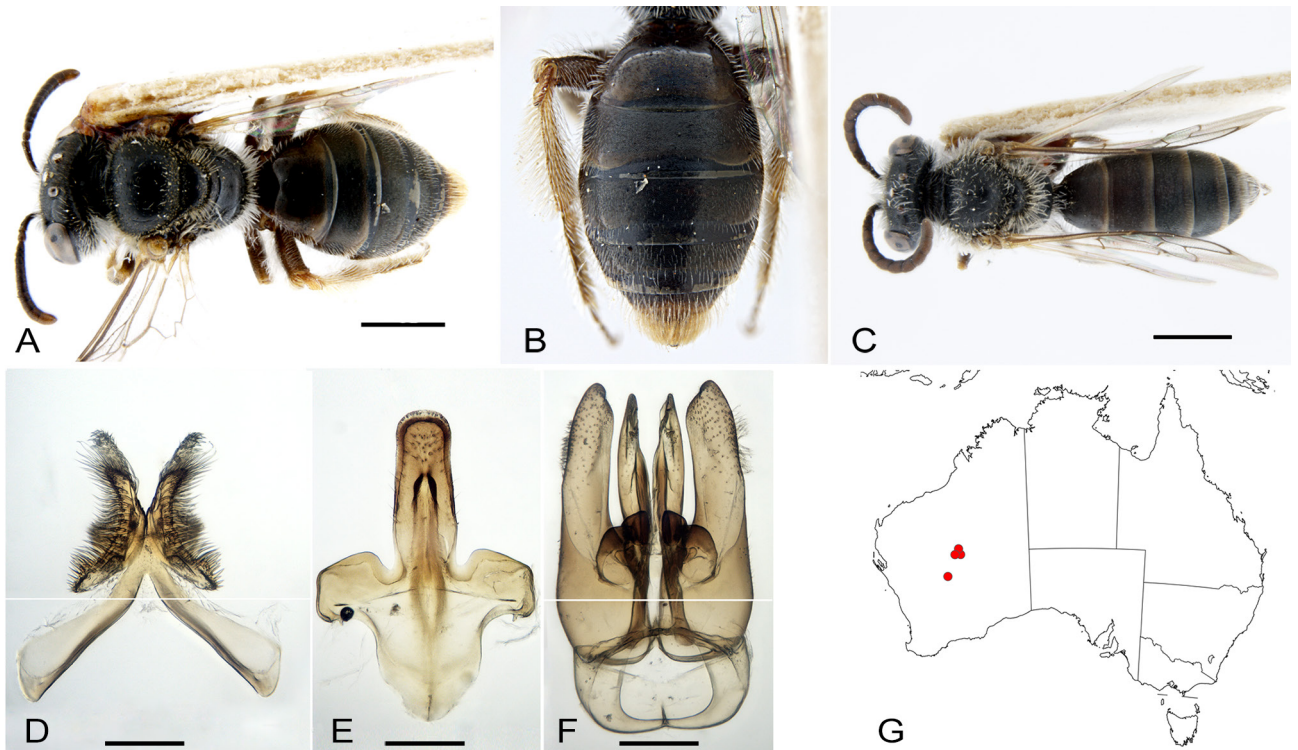


Figure 16. *Leioproctus* (*Euryglossidia*) *chrysopyga* sp. nov.: A, ♀ dorsal view; B, ♀ metasoma; C, ♂ dorsal view; D–F, ♂ terminalia ventral views; G, collection locations. Scale bars: A, C, 1 mm; D–F, 200 μm .

on anterior margin, folded bipectinate on posterior margin; metasoma dorsally with sparse hair, except for golden prepygidial fimbria; metasomal sterna S2–S5 with narrow rows of erect, white, openly pectinate hair, $2\times\text{MOD}$; S5 and S6 with dense apical fringes.

Sculpture. Punctures on clypeus small, mid-sized, $i=1-2d$, with reticulate interspaces; supraclypeal area medially impunctate and reticulate; frons strongly reticulate with indistinct small punctures, $i=1-2d$; scutum reticulate, impunctate medially, with small punctures near margins, $i=1-4d$; scutellum impunctate and polished except near margins; propodeal triangle more coarsely reticulate, peripheral suture indicated with short sulci antero-laterally; metasomal terga shiny, finely lineo-reticulate, punctures sparse and tiny.

Etymology. The specific epithet is a Latinised Greek noun in apposition meaning golden tail.

Leioproctus (Euryglossidia)

clivifrons sp. nov.

urn:lsid:zoobank.org:act:60D06E2A-CBF2-4024-9843-B6CD36B6A79B

Fig. 17

Holotype. ♂ 70 km NE Wubin, WA (29.70°S 117.09°E), 28 Aug 1981, G. A. Holloway AMS K.396323.

Paratypes. 2♀, collection data as for holotype, AMS K.396325, 6; 1♀, 65 km E Southern Cross, WA (31.261°S 120.027°E), 9 Aug 2008, R Leijds, SAM 32-44784.

Diagnosis. Moderately large, male ocellocular area depressed and flagellum long (FL>150), head (except

clypeus) and mesosoma of both sexes black with faint blue iridescence, metasoma black with faint iridescence (male) or orange brown with darker markings (female), male metasomal sterna with sparse hair, male mid and hind basitarsi orange-brown, unmodified. Females distinguished from *mastersi*, *purpurascens* and *pustulatus* by curly tipped hair on hind tibial scopa, and from *crystaliventris* by colour of legs and metasoma.

Description of male. Body length: 8.5 mm. Relative head measurements: HW 100; HL 76; UFW 71; LFW 56; CL 28; FL 190; SL 27.

Vertex elevated well above apex of compound eyes; inner orbits convergent ventrally; length of subantennal sutures equal to diameter of antennal socket; clypeus and supraclypeal area convex, prominent; frons angled at 30° to clypeus; sulcus below median ocellus narrow, dull; ocellocular area strongly depressed; flagellum long, segments fl2–fl11 a bit more than twice as long as wide; legs not significantly modified; claws cleft.

Colouration. Head and mesosoma black except legs dark brown with femora apically, tibiae, distitarsi and hind basitarsus orange-brown; metasoma faintly iridescent blue with T1 weakly brassy.

Pubescence. Hair on only male specimen worn, particularly on mesosoma. Hair that remains indicates: hair of clypeus and lower paraocular areas adpressed, dense, white, mostly simple, $2-3\times\text{MOD}$; fringe on lower margin of mandible close, white, $2-3\times\text{MOD}$; metasomal sterna without signs hair tufts or their sockets.

Sculpture. Clypeal punctures strong, mid-sized, $i\approx d$, with weakly reticulate interspaces; front face of supraclypeal area impunctate, shiny, reticulate; frons with indistinct medium punctures, strong reticulation and irregular, fine, vertical rugae, sculpture weak near top of eye; ocellocular

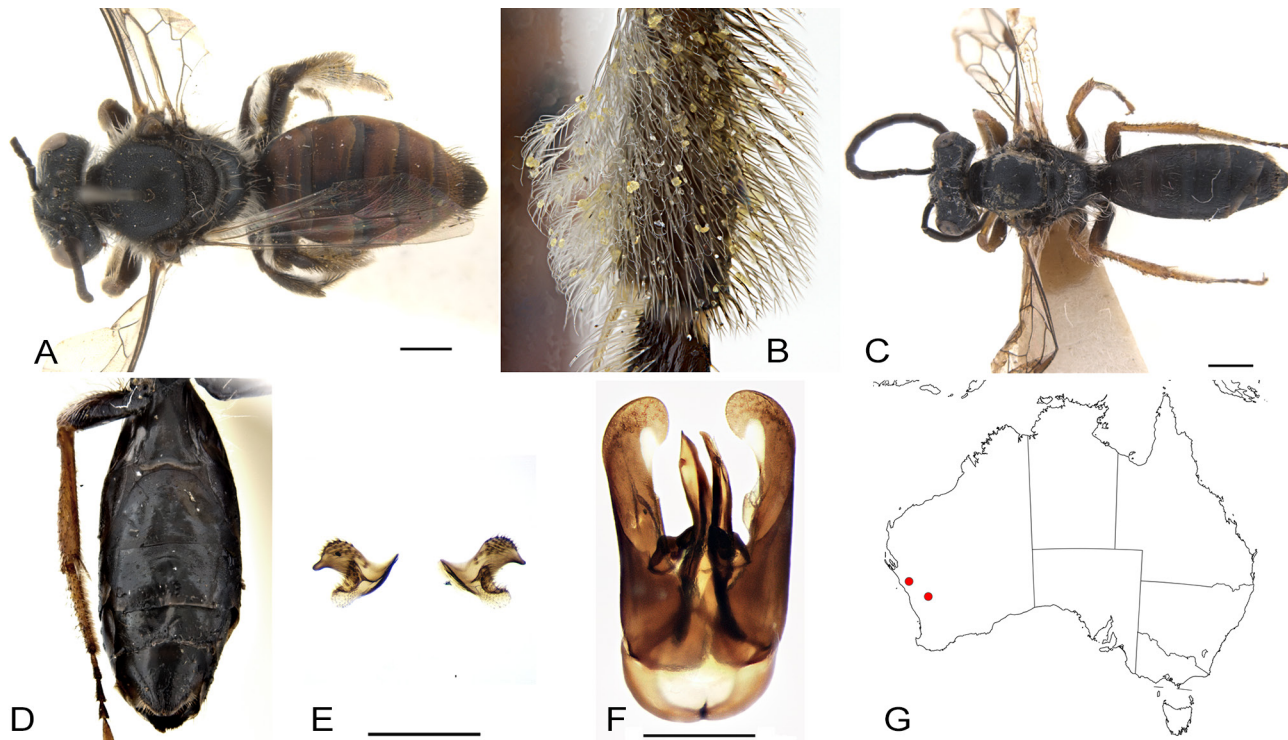


Figure 17. *Leioproctus (Euryglossidia) clivifrons* sp. nov.: A, ♀ dorsal view; B, ♀ hind tibial scopa; C, ♂ dorsal view; D, ♂ metasoma ventral view; E, ♂ S7 (part) ventral view; F, ♂ genital capsule ventral view; G, collection locations. Scale bars: A, C, 1 mm; E, F, 200 μm.

area striate; punctures of scutum and scutellum obscured by strong reticulation; propodeal triangle strongly reticulate with longitudinal rugae except medially, peripheral suture indicated by a narrow scrobiculate sulcus.

Description of female. Body length *ca* 8.5 mm. Relative head measurements: HW 100; HL 76; UFW 70; LFW 64; CL 31; FL 76; SL 36.

Inner orbits convergent ventrally; mandible bidentate; clypeus convex; frons weakly bigibbous; median carina extends half way to median ocellus, replaced by deep polished sulcus for upper half; ocellular area slightly depressed; flagellum moderately long, segments fl2–fl7 approximately as long as wide; gena more than half as wide as compound eye viewed laterally, inner hind tibial spur with 3–4 coarse, widely-spaced teeth longer than width of spur; claws with basal inner tooth

Colouration. Head iridescent blue except clypeus and supraclypeal area black; mesosoma iridescent blue except scutellum and metanotum black; legs dark brown with anterior face of foreleg orange-brown at distal end of femur and proximal end of tibia; flagellum dark brown dorsally, paler ventrally; tegula transparent dark brown; metasomal terga orange-brown with mid-brown apical margins and dark brown oval mark laterally on T2, sometimes with additional brown markings.

Pubescence. Clypeal hair sparse, white, plumose, $2\times\text{MOD}$ interspersed with simple setae; hair of lower paraocular and interantennal areas denser and more strongly branched, $2\times\text{MOD}$; on scutum open, pale brown, finely-branched, $1\times\text{MOD}$, interspersed with dark simple setae, *ca* $2\times\text{MOD}$; on sides of mesosoma plumose, white, $2\text{--}3\times\text{MOD}$; hair of hind tibial scopa close, white, bipectinate with crinkled tips on anterior margin, dark brown, pectinate medially, but unbranched near the basitibial plate; hair on metasomal terga sparse except for dark brown prepygidial fimbria; metasomal sterna S2–S5 with close, weakly branched, white hair, *ca* $3\times\text{MOD}$; S5, S6 with dense, apical fringes, $1.5\times\text{MOD}$.

Sculpture. Clypeal punctures strong, medium to large, $i=1\text{--}2d$, with polished interspaces; supraclypeal area polished, impunctate medially; punctures of lower paraocular areas small, $i<d$, interspaces shiny; frons with irregular vertical rugae and strong reticulation obscuring small punctures, sculpture weak adjacent to top of inner orbit where fovea are usually located; punctures of scutum and scutellum small, $i\approx d$, interspaces reticulate on scutum, shiny on scutellum; propodeal triangle reticulate but shiny, basal $\frac{1}{3}$ of peripheral suture with shallow, broad sulcus crossed by several rugae.

Variation. The colour of the female metasoma is variable, with additional irregular brown markings.

Etymology. The specific epithet is a Latin noun meaning “sloping forehead” and refers to the frons of the male.

Leioproctus (*Euryglossidia*)

comosus sp. nov.

urn:lsid:zoobank.org:act:4C4E5B34-A344-408D-86AF-FC2D957F1F5E

Fig. 18

Holotype. ♀ Mount Gibson Station, WA (29.768°S 117.395°E), 28 Aug 2001, R. Leys, on *Borya*, SAM 32-44700.

Paratypes. 3♀, same collection data as holotype, SAMA 32-44701–03.

Diagnosis. Small, head and mesosoma black with weak brassy sheen on frons and scutum, metasoma black, apical tergal margins translucent, frons with irregular sculpture but punctures visible, scutum closely punctate with reticulate interspaces and close short brown hair ($0.5\times\text{MOD}$), supraclypeal area strongly reticulate and dull, resembles *asperifrons* but scutal hair denser and punctures clearly visible on frons, *halictiformis* also has conspicuous scutal hair but propodeal triangle has basal rugae, scutal reticulation weak and prepygidial fimbria pale.

Description of female. Body length 5.8 mm. Relative head measurements: HW 100; HL 76; UFW 69; LFW 61; CL 26; FL 69; SL 30.

Inner orbits almost parallel; mandible bidentate, smoothly curved; clypeus convex, supraclypeal area prominent; frontal carina extends halfway to median ocellus; flagellum short, segments fl2–fl10 shorter than wide; gena less than half as wide as compound eye viewed laterally; inner hind tibial spur with 6 teeth almost twice as long as width of spur; claws with sharp medial tooth.

Colouration. Black with slight brassy sheen except flagellum dark brown dorsally, mostly yellow-brown ventrally, legs brown with anterior face of fore tibia yellow-brown, mesosoma dark brown, apical margins of metasomal terga translucent.

Pubescence. Hair on clypeus, paraocular areas and lower frons open, white to pale brown, $2\times\text{MOD}$, plumose on clypeus and lower frons, closely branched in paraocular area; scutal hair close, pale brown, erect, tightly-branched, $0.5\times\text{MOD}$, interspersed with longer, dark brown hair, both simple and branched; hair of mesepisternum white, plumose, $\sim 2\times\text{MOD}$; hair of hind tibial scopa open, white, bipectinate



Figure 18. *Leioproctus* (*Euryglossidia*) *comosus* sp. nov. ♀: A, dorsal view, scale bar 1 mm; B, scutum lateral view; C, clypeus; D, collection locations.

on anterior half, pectinate on posterior half; metasomal hair sparse dorsally apart from dark brown prepygidial fimbria; hair of metasomal sterna S2–S5 open, erect, white, weakly branched, $2\text{--}3\times\text{MOD}$; apical fringes of S5, S6 dense, tightly branched, $2\times\text{MOD}$.

Sculpture. Punctures on clypeus, mostly large, $i < d$, interspaces polished, interspersed with a few small punctures; supraclypeal area reticulate with small punctures, $i = d$; frons strongly reticulate with irregular vertical rugae and small punctures, $i = d$; scutum and scutellum densely covered with small punctures, $i = 0.5d$ and moderately reticulate interspaces; propodeal triangle more coarsely reticulate with a weak peripheral suture.

Male. Unknown.

Etymology. The specific epithet is Latin adjective meaning hairy and referring to the scutal pubescence.

Leioproctus (Euryglossidia)

conjunctus sp. nov.

urn:lsid:zoobank.org:act:5FAF6A0D-6CFA-4D38-84A0-B6B5F31971

Fig. 19

Holotype. ♂ 83 km WNW Wiluna, WA, 27–28 July 1983, T.F. Houston & R.P. McMillan, on *Ptilotus obovatus*, WAM 11218.

Diagnosis. Small, mostly black, scutum reticulate and dull; metasoma with satin sheen, frons coarsely scabrous, propodeal triangle without rugae, basitarsi yellow-brown basitarsi, first recurrent vein of forewing almost meeting first transverse cubital vein.

Description of male. Body length 5.2 mm. Relative head measurements: HW 100; HL 83; UFW 69; LFW 51; CL 27; FL 135; SL 28.

Inner orbits strongly convergent ventrally; clypeus transversely convex; mandible bidentate, smoothly curved; frontal carina extends half way to median ocellus; flagellum moderately long, all segments except first longer than wide; first recurrent vein of forewing interstitial with first submarginal crossvein; claws cleft.

Colouration. Black with faint brassy sheen, except flagellum dark brown dorsally, yellow brown ventrally, tegulae and wing veins transparent dark brown, all basitarsi, joints between femora and tibiae and parts of fore tibia yellow-brown.

Pubescence. Hair on clypeus and lower paraocular areas silvery white, semi-adpressed, minutely branched, $2\times\text{MOD}$; on lower frons and gena open, erect, white, plumose, $1.5\text{--}2\times\text{MOD}$; on scutum sparse, fine, white, erect, mostly simple, $1\times\text{MOD}$; on mesepisternum open, white, erect, plumose, $2\times\text{MOD}$; on metasoma sparse except the ventrally facing lateral margins of T2–T4 with adpressed white hair and S4 & S5 with weak apical fringes.

Sculpture. Punctures on clypeus and supraclypeal area small, $i < d$, with reticulate interspaces; frons strongly roughened, probably by a combination of strong reticulation and close punctures; scutum with strong reticulation obscuring small weak punctures; propodeal triangle reticulate, peripheral suture weakly indicated; metasomal terga with satin lineo-reticulation.

Description of female. Unknown

Etymology. The specific epithet is a Latin adjective meaning adjoining, referring to the forewing venation.

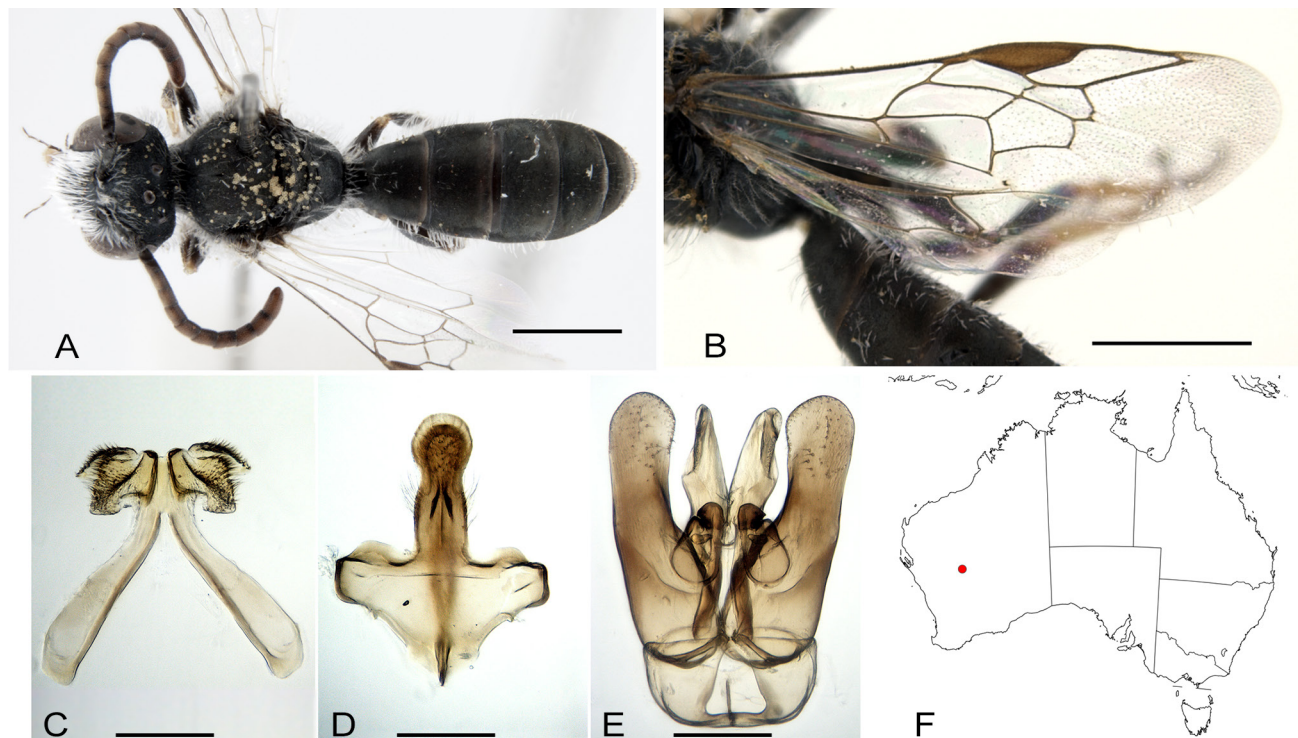


Figure 19. *Leioproctus (Euryglossidia) conjunctus* sp. nov. ♂: A, dorsal view; B, right forewing; C–E, terminalia ventral views; F, collection locations. Scale bars: A, B, 1 mm; C–E, 200 μm .

Leioproctus (*Euryglossidia*)*criniventris* sp. nov.

urn:lsid:zoobank.org:act:A3C62030-124C-4310-BFD0-2A4C8D29047A

Fig. 20

Holotype. ♂ 5 km SE Thundelarra, WA (28.925°S 117.165°E), 28 Aug 1981, T.F. Houston, on *Hakea preissii*, WAM 10697.

Paratypes. 2♀ 1♂, collection data as for holotype, WAM 10696, 8, 9.

Other specimens examined: 2♀, near Emu Rock, Forrestania, WA (32.457°S 119.401°E), 9–14 Oct 1979, T.F. Houston, on *Leptospermum erubescens* & *Acacia ligulata*, WAM 10700, 1; 1♂, 3 km WSW Burnabinmah, WA (28.783°S 117.367°E), 28 Aug 1981, T.F. Houston, on *Grevillea paniculata*, WAM 10702; 1♂, 6 km ENE Warriadar, WA (29.113°S 117.242°E), 27 Aug 1981, T.F. Houston, on *Hakea preissii*, WAM 10703.

Diagnosis. Large, weakly iridescent, male with depressed ocellular areas, female mesosoma laterally weak iridescent blue, male tibiae and tarsi orange, female legs dark brown or black, females are indistinguishable from *cristiventris*, but differ from those of *clivifrons* by the orange lower legs and from *korungensis* by a propodeal triangle with a long scrobiculate peripheral sulcus, males distinguished from those of *korungensis* by expanded mid basitarsus and from *cristiventris* and *clivifrons* by sternal hair pattern.

Description of male. Body length 10.5 mm. Relative head measurements: HW 100; HL 75; UFW 70; LFW 60; CL 26; FL 164; SL 25.

Head wide, inner orbits converging ventrally; ocellular area strongly depressed; vertex elevated well above top of eyes; subantennal sutures short, about as long as width antennal socket; clypeus convex; supraclypeal area

prominent; frons below median ocellus with narrow linear sulcus; mandible bidentate, with strong outer ridge; flagellum long, segments fl2–fl11 at least twice as long as wide; mid basitarsus broad, spatulate; hind tarsus about as long as hind tibia, with relative length of tarsal segments 100:35:25:15:25; claws cleft.

Colouration. Head, mesosoma and metasoma black with hints of iridescence; mandible brown with dark red tip; flagellum and tegulae dark brown; legs black proximally, tibiae and proximal ends of basitarsi dull orange-brown, remainder of tarsi dark brown; wings infuscate.

Pubescence. Hair of clypeus and lower paraocular areas adpressed, dense, white, slightly flattened, 2×MOD; fringe on lower margin of mandible dense, white, 2×MOD; gena with ventral beard of white hair, 4–5×MOD; hair on scutum and scutellum open, white, finely branched, 1×MOD; on sides of mesosoma open, white, finely branched, ca 5×MOD; metasomal terga with sparse to open, long white hair; subapical areas of S2–S5 with bands of erect, white, openly-branched hair, 3×MOD.

Sculpture. Punctures on clypeus small, $i \approx 0.5d$, with weakly reticulate, shiny interspaces; front surface of supraclypeal area impunctate with weak reticulation; strong reticulation on frons obscuring mid-sized punctures; otherwise as for female.

Description of female. Body length 10.4 mm. Relative head measurements: HW 100; HL 75; UFW 69; LFW 65; CL 28; FL 74; SL 35.

Lower inner orbits subparallel; clypeus convex, marginal area confined to median half of ventral edge; anterior face of supraclypeal area flat, triangular at an angle to clypeus; frontal carina extending more than half way to median ocellus; mandible bidentate, smoothly curved; length of flagellum moderate, segments fl3–fl10 longer than wide; width of mid basitarsus less than 0.49×length; inner hind tibial spur with 5 well-separated teeth, basal teeth twice as long as width of spur; claws with a large medial tooth.

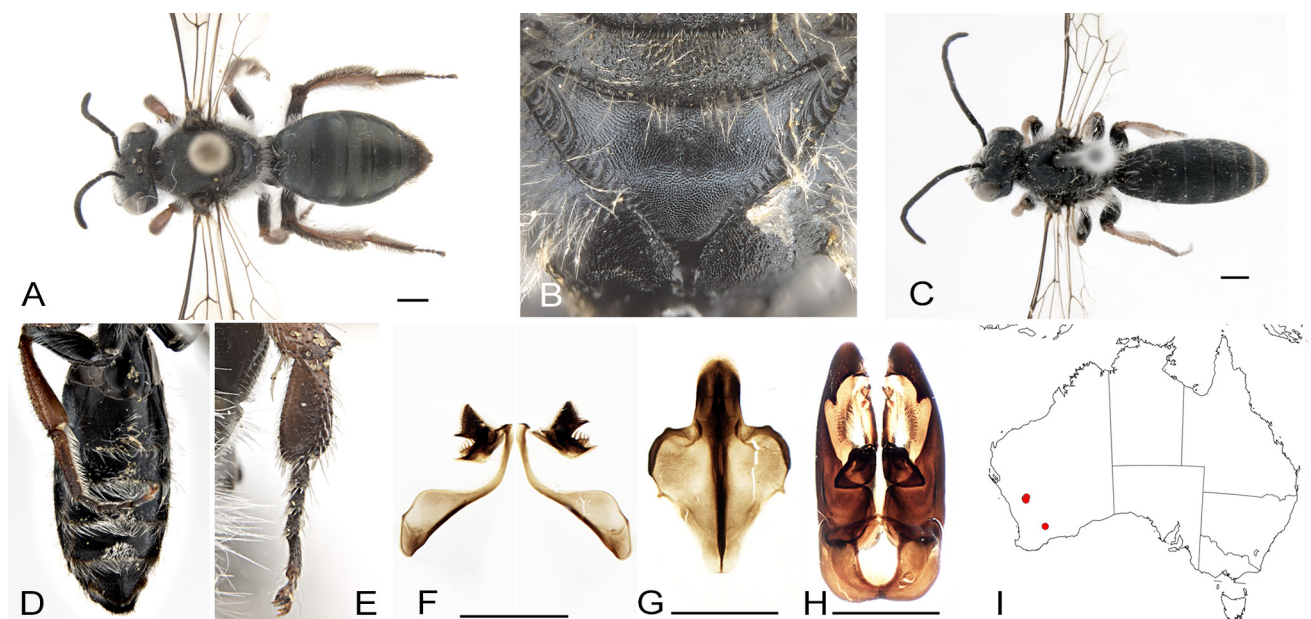


Figure 20. *Leioproctus* (*Euryglossidia*) *criniventris* sp. nov.: A, ♀ dorsal view; B, ♀ propodeal triangle; C, ♂ dorsal view; D, ♂ metasoma ventral view; E, ♂ mid basitarsus; F–H, ♂ terminalia ventral view; I, collection locations. Scale bars: 1 mm.

Colouration. Clypeus and supraclypeal area black; upper head and mesosoma iridescent blue except frons, scutum, scutellum and metanotum with brassy sheen; mandible brown with dark red tip; flagellum and tegulae dark brown; legs black proximally, tarsi, tibiae and distal ends of femora rich orange-brown; wings infuscate; metasoma iridescent blue with faint brassy sheen on T1, T2 and stronger sheen on T3–T5; prepygidial fimbria dark brown.

Pubescence. Hair on clypeus open to sparse, white, weakly branched, $2\times\text{MOD}$; in paraocular areas, on lower frons and gena open, white, plumose, $1\text{--}2\times\text{MOD}$; hair on scutum sparse, pale brown, weakly branched, $0.5\text{--}1\times\text{MOD}$, interspersed with longer, dark brown simple setae; hair of mesepisternum open, white, plumose, $2\times\text{MOD}$; hair of hind tibial scopa white, bipectinate on anterior margin, brown, pectinate elsewhere; metasoma dorsally with sparse hair, except for weak prepygidial fimbria of mostly simple hair; apical half of metasomal sterna S2–S4 with plumose white hair, $2\times\text{MOD}$; apical half S5 with almost simple pale brown hair and a dense apical fringe of similar hair, $2\times\text{MOD}$; apical half S6 with close pale brown, plumose hair.

Sculpture. Punctures on clypeus and lateral faces of supraclypeal area small to mid-sized, $i < d$, with polished interspaces; anterior face of supraclypeal area polished, impunctate; frons with shallow, mid-sized punctures, $i < d$, and reticulate interspaces; punctures on scutum obscured by strong reticulation; those on scutellum mid-sized, almost contiguous $i < d$; propodeal triangle reticulate with peripheral suture marked by a deep, wide, scrobiculate sulcus.

Etymology. The specific epithet is a Latin adjective meaning with a hairy venter.

Leioproctus (Euryglossidia)

cristativentris sp. nov.

urn:lsid:zoobank.org:act:90640E6F-D3C5-48ED-A9DD-408F7488FB5F

Fig. 21

Holotype. ♂, 70 km NE Wubin, WA (29.68°S 117.11°E), 28 Aug 1981, G.A. Holloway, AMS K.396316.

Paratypes. 7♀, same collection data as holotype, AMS K.396310–16; 2♂, Morowa District, WA (29.2°S 116.0°E), 9 Aug 1934, ANIC; 1♂, Durokoppin NR, WA (31.410°S 117.768°E), 12 Sep 1986, T.F. Houston, on *Leptospermum erubescens*, WAM 10613.

Other specimens examined: 2♀, 20 km NE Wubin, WA (30.02°S 116.81°E), 27 Aug 1981, G.A. Holloway, AMS K.; 2♀, 35 km SW Paynes Find, WA (29.34°S 117.35°E), 29 Aug 1981, G.A. Holloway, AMS K.396319, 29.

Diagnosis. Moderately large, black with weak blue iridescence, except clypeus black, tibiae and basitarsi orange-brown, male with depressed ocellular area, female hind tibial scopa largely brown; male with broad mid basitarsus and long hair tufts on metasomal sterna, female indistinguishable from *criniventris*, male distinguished from similar species by pattern hair on metasomal sterna and by terminalia.

Description of male. Body length: ca 10 mm. Relative measurements: HW 100; HL 73; UFW 69; LFW 57; CL 24; FL 175; SL 26.

Head wide, inner orbits converge ventrally; ocellular area strongly depressed; vertex elevated well above top of eyes; subantennal sutures short, about as long as width antennal socket; clypeus convex; supraclypeal area prominent; frons below median ocellus with triangular, polished sulcus; mandible bidentate, with strong outer

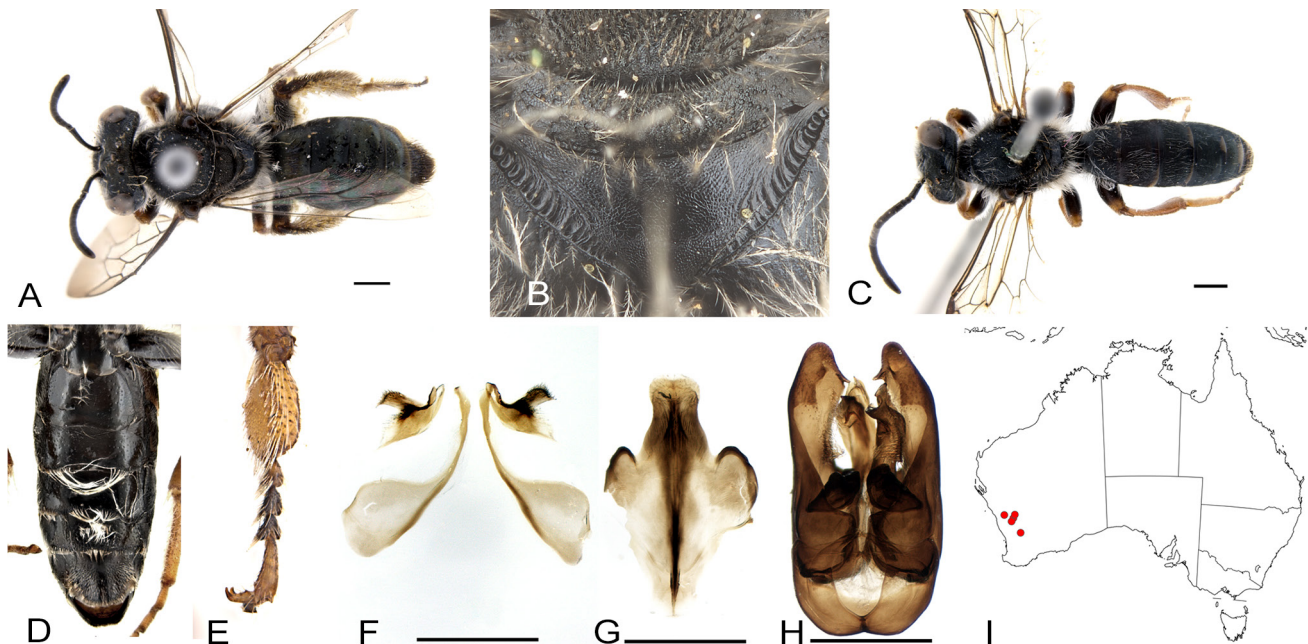


Figure 21. *Leioproctus (Euryglossidia) cristativentris* sp. nov.: A, ♀ dorsal view; B, ♀ propodeal triangle; C, ♂ dorsal view; D, ♂ metasoma ventral view; E, ♂ mid basitarsus; F–H, ♂ terminalia ventral view; I, collection locations. Scale bars: 1 mm.

ridge; flagellum long, segments fl2–fl11 twice as long as wide; mid femur with blunt ventral projection near distal end; mid basitarsus broad, spathulate; hind tarsus 1.8 times as long as hind tibia with relative length of tarsal segments 100:35:40:25:50; claws cleft.

Colouration. Clypeus black, remainder of head, mesosoma and metasoma weakly iridescent blue-green, except scutellum black, legs dark brown proximally, tibiae, tarsi and apices of femora orange-brown, flagellum dark brown dorsally, paler ventrally, tegula transparent dark brown, wings tinted brown.

Pubescence. Hair of clypeus and lower paraocular areas adpressed, dense, gold or pale yellow, simple, 2–4×MOD; fringe on lower margin of mandible dense, white, 4×MOD; hair on dorsal surfaces of supraclypeal area erect, white, plumose, 2×MOD; on gena white, closely branched, 1–2×MOD; on scutum and scutellum open, erect, plumose, white, 1.5–2×MOD; on sides of mesosoma open, plumose, white, 3–5×MOD; metasomal tergal hair sparse, white; sterna with tufts of erect, white, openly-branched hair apicolaterally on S3, S4, 4–5×MOD, medially on S5, 2×MOD; S5 with an apical fringe, longest medially.

Sculpture. Punctures of clypeus and lower paraocular areas small to medium, dense, $i < 0.5d$, with shiny interspaces; front face of supraclypeal area impunctate with weak reticulation; frons strongly reticulate between small, shallow punctures, $i = d$; scutum strongly reticulate with small, shallow punctures, $i \approx 2d$; propodeal triangle more coarsely reticulate with peripheral suture marked by a strong scrobiculate sulcus; metasomal terga finely reticulate.

Description of female. Body length 10.8 mm. Relative measurements: HW 100; HL 70; UFW 68; LFW 64; CL 28; FL 74; SL 33.

Head wide, inner orbits almost parallel; ocellocular area weakly depressed; mandible bidentate, smoothly curved; clypeus convex; flagellum moderately long, segments fl2–fl7 about as long as wide; gena more than half as wide as compound eye viewed laterally; inner hind tibial spur with *ca* 4 strong, oblique teeth, longer than width of spur; claws cleft.

Colouration. As for male except iridescence more pronounced and legs dark brown except tibiae, basitarsi and apices of femora red-brown.

Pubescence. Clypeal hair sparse, white, plumose, 2×MOD interspersed with simple setae, 3×MOD; hair of lower paraocular areas, lower frons and gena dense, white, plumose; of scutum and scutellum open, weakly-branched, 1×MOD, interspersed with dark simple setae, 2×MOD; on sides of mesosoma plumose, white, $\leq 4 \times \text{MOD}$; fore basitarsus with dense brush of stiff setae; hair of hind tibial scopa close, dark brown, pectinate except white, with complex branching on anterior margin, dark brown, unbranched near basitibial plate; hair on metasomal terga sparse apart from dark brown prepygidial fimbria; hair of metasomal sterna S2–S5 close, weakly-branched, 2×MOD; S5 with dense apical fringe, 2×MOD; S6 with similar hair medially.

Sculpture. Punctures on clypeus and lower paraocular areas medium, $i < d$, with polished interspaces; front face of supraclypeal area polished, impunctate; frons coarsely roughened by strong, contiguous, medium punctures on a finely, but strongly reticulate ground; fovea indicated by absence of punctures; scutum strongly reticulate, obscuring

weak, small punctures, $i = 2d$; scutellum with dense, small punctures, $i \leq d$ and weak reticulation; propodeal triangle moderately reticulate, peripheral suture marked by strong scrobiculate sulcus; metasomal terga finely reticulate.

Variation. Some females with dark brown basitarsi.

Etymology. The specific epithet is a Latin adjective meaning “with a tufted venter” referring to the male.

Leioproctus (*Euryglossidia*) *cygnellus* (Cockerell, 1905)

Fig. 22

Euryglossa cygnella Cockerell, 1905: 473.

Euryglossa cyanescens Cockerell, 1929: 215. **new synonymy.**

Leioproctus (*Euryglossidia*) *cygnellus* (Cockerell)—Michener, 1965: 68.

Leioproctus (*Euryglossidia*) *cyanescens* (Cockerell)—Michener, 1965: 68.

Euryglossidia (*Manocolletes*) *cyanescens* Cockerell—Engel and Gonzalez, 2022: 32.

Euryglossidia (*Cygnella*) *cygnella* (Cockerell)—Engel and Gonzalez, 2022: 32.

Holotype. ♂ of *cygnella*, Swan River, WA NHM Hym.17.a.263—examined using images from NHM Portal; missing segments 6–10 of left flagellum, left mid tibia and tarsus, right hind tarsal segments 2–5, metasoma glued to card.

Holotype. ♀ of *cyanescens*, Kojarena, WA., 6 Sep 1926, A. J. Nicholson, AMS K.95563.

Other specimens examined: 54♀ 2♂, 70 km NE Wubin, WA (29.68 °S 117.11°E), 28 Aug 1981, G.A. Holloway, AMS K.396238–93; 8♀, Carrabin, WA (31.38°S 118.65°E), 29 Oct 1985, R. Bejsak, AMS; 4♀, 15 km N Westonia, WA (31.198°S 118.759°E), 20 Sep 2004, M. Batley, on *Acacia*, AMS; 22♀, nr Emu Rock, WA (32.457°S 119.401°E), 9 Oct 1979, T.F. Houston, on *Acacia ligulata*, *Hakea preissii* & *Muehlenbeckia adpressa*, WAM 10723–44; 5♀ 3♂, 30 km N Bullfinch, WA (30.80°S 118.94°E), 7 Sep 1979, T.F. Houston *et al.*, on *Acacia aciphylla* & *Thryptomene tuberculata*, WAM 10745–52; 3♀, Uberin Rock, WA (31.00°S 116.98°E), 16 Sep 1984, T.F. Houston, on *Leptospermum*, WAM 10753–5; 3♀ Watheroo NP, WA (30.168°S 115.836°E), 3–5 Oct 1980, T.F. Houston, on *Acacia ligulata* & *Scholtzia parviflora?*, WAM 10756–58; 1♀ 1♂, 13 km S Watheroo NP, WA (26.930°S 114.625°E), 30 Jul 1985, T.F. Houston, on *Hakea*, WAM10761–62; 1♀, 22 km S Watheroo NP, WA (28.262°S 117.846°E), 6 Sep 1980, C.A. Howard & T.F. Houston, on *Keraudrenia integrifolia*, WAM 10765.

Diagnosis. Small, head and mesosoma black, metasoma bicoloured red- or orange-brown and black, scutum coarsely punctured, female hind tibial scopa sparse, with simple setae only, male flagellum more than twice as long as head width.

Redescription of male. Body length: *ca* 5.7 mm. Relative head measurements: HW 100; HL 76; UFW 70; LFW 54; CL 28; FL 215; SL 33.

Colouration. Head and mesosoma as for female except flagellum brown dorsally and orange-brown ventrally.

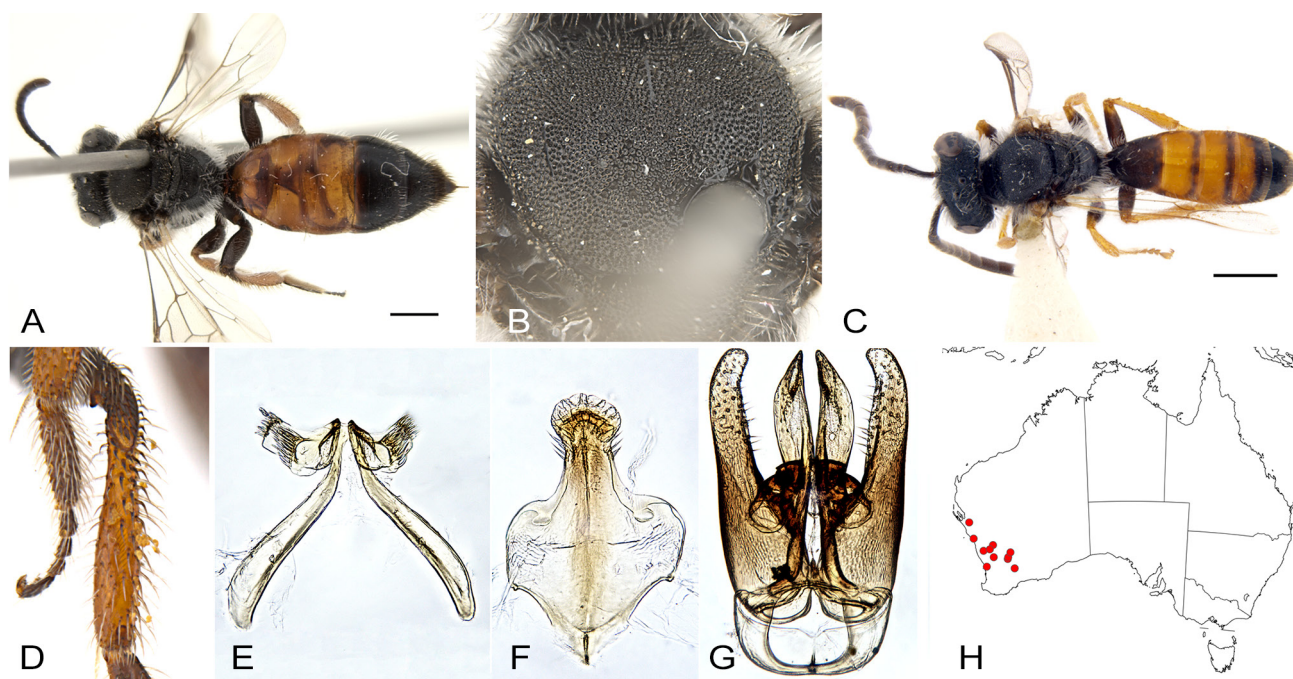


Figure 22. *Leioproctus (Euryglossidia) cygnellus* (Cockerell): A, ♀ dorsal view; B, ♀ scutum; C, ♂ dorsal view; D, ♀ hind tibia; E–G, ♂ terminalia ventral views; H, collection locations. Scale bars: A, C, 1 mm; E–G, 200 µm.

Metasoma variable in colour, with some specimens with T1–T3 orange-brown or red-brown and T4–T6 dark brown or black, while in other specimens T1 is dark and T2, T3 orange-brown with dark brown posterior bands.

Pubescence. Face below antennal sockets densely covered with adpressed white, closely branched hair $2\times\text{MOD}$, lower frons with similar hair but close and erect; scutum with sparse, fine, erect, almost simple pale setae, a mixture of finer setae $0.5\times\text{MOD}$ and coarser setae $2\times\text{MOD}$; sides of mesosoma with sparse, erect, plumose white hair $2\times\text{MOD}$ becoming a bit denser on propodeum; metasomal hair sparse apart from weak apical white fringes $<1\times\text{MOD}$ on S4, S5.

Sculpture. Clypeal punctures large, almost contiguous with reticulate interspaces; front surface of supraclypeal area closely punctate, polished; frons with strong, mid-sized punctures $i<d$ and strongly reticulate interspaces; scutum with almost contiguous punctures and polished interspaces; punctures open on scutellum, $i\approx d$; propodeal triangle reticulate with longitudinal rugae basally, lateral rugae curved to meet wide scrobiculate suture at 90° ; metasoma with fine lineo-reticulation, and sparse punctures.

Redescription of female. Body length *ca* 7.3 mm. Relative head measurements: HW 100; HL 80; UFW 67; LFW 61; CL 25; FL 90; SL 41.

Clypeus gently convex, supraclypeal area moderately protuberant, medial line carinate about half way to medial ocellus becoming a distinct sulcus for the upper half; inner hind tibial spur with 4–6 teeth as long as width of spur and claws with a sharp medial inner tooth.

Colouration. Head and mesosoma black with apex of mandible red, flagellum ventrally and tegula brown; legs black basally with tibiae and apices of femora orange-brown, tarsi brown; metasomal terga T1–T3 orange-brown or red-brown, T4–T6 black, all terga with a slight bluish sheen, T2 laterally with large black oval fovea (*sensu* Michener).

Pubescence. Clypeus, paraocular area and lower frons

with open white, closely-branched, erect or semi adpressed hair $1.5\times\text{MOD}$, interspersed, particularly on clypeus, with simple setae $1.5\times\text{MOD}$; scutum with open, fine, semi-adpressed, brown hair *ca* $0.3\times\text{MOD}$ and sparse dark brown almost unbranched setae $1.5\times\text{MOD}$; sides of mesosoma with open to sparse, erect, white, plumose hair $2\times\text{MOD}$ which becomes close to dense on the propodeum (but not the propodeal triangle); hind femoral scopa virtually absent; prepygidial fimbria black; metasomal sterna S2–S4 with sparse apical rows of white hair $2\times\text{MOD}$.

Sculpture. Clypeal punctures large, almost contiguous with polished interspaces; front surface of supraclypeal area impunctate, polished; frons with strong, mid-sized punctures $i<d$ and strongly reticulate interspaces; scutum with almost contiguous punctures and polished interspaces; punctures open on scutellum, $i\approx d$; propodeal triangle reticulate with strong longitudinal rugae basally, curving to meet peripheral suture; metasoma with fine lineo-reticulation, and sparse punctures becoming dense in the vicinity of the fimbria.

Leioproctus (Euryglossidia)

diloris sp. nov.

urn:lsid:zoobank.org:act:1FB092D7-CEEF-4A3C-8D70-7D45DF03E6EA

Fig. 23

Holotype. ♂ 60 km N Esperance, WA (33.361°S 121.699°E), M. Batley, on *Daviesia*, AMS K.360032.

Paratypes. 3 ♀ 2 ♂, collection data as for holotype, AMS K.360027–31; 1 ♀, 166 km W Esperance, WA (33.7°S 123.6°E), 16 Oct 1974, C.A. & T.F. Houston, SAM 32-44809.

Diagnosis. Small, head and mesosoma black, metasoma dull orange and brown, frons rugose-reticulate, clypeus weakly reticulate and sparsely punctate medially, scutum

strongly reticulate, propodeal triangle without rugae, like *australiensis* but female clypeus more gently convex, hind tibial scopa denser with more strongly branched hair, male terminalia differ from those of *australiensis*, female distinguished from *mastersi* by duller metasomal colour, triangular supraclypeal area and smaller, non-coalescent clypeal punctures.

Description of male. Body length 6.7 mm. Relative head measurements: HW 100; HL 85; UFW 65; LFW 52; CL 28; FL 190; SL 32.

Head wider than long with inner orbits converging ventrally; mandible bidentate, smoothly curved; flagellum long, segments fl2–fl11 almost twice as long as wide; claws cleft.

Colouration. Head and mesosoma black, metasoma dark brown with narrow yellow-brown bands basally on T2, T3; legs dark brown except anterior faces of fore and mid tibiae yellow-brown; mandible black with dark red apex; flagellum dark brown; tegula transparent brown.

Pubescence. Hair on clypeus sparse except close, white, semi-adpressed on lateral margins, <MOD; lower paraocular areas with close, white, semi-adpressed hair, ca 1×MOD; hair on gena erect, white, finely branched, 1–2×MOD; scutal hair sparse; scutellum with open, brown, unbranched setae, 2×MOD; mesosoma laterally with open, white, finely branched hair, 2×MOD; metasomal hair sparse.

Sculpture. Punctures on clypeus medium to small with reticulate but shiny interspaces, i=1–3d; remainder of face with small dense punctures, i≤d, distinct in lower paraocular areas becoming shallow and obscured by reticulation and fine vertical rugae on frons; scutum and scutellum strongly reticulate, scutum with indistinct small punctures, stronger on scutellum, i=1–2d; propodeal triangle reticulate, anterior ends of peripheral suture marked by broad scrobiculate sulci.

Description of female. Body length 7.5 mm. Relative measurements: HW 100; HL 76; UFW 68; LFW 62; CL 27; FL 73; SL 32.

Inner orbits gently convergent ventrally; mandible bidentate, smoothly curved; clypeus gently convex transversely; flagellar segments fl4–fl9 slightly longer than wide; inner hind tibial spur with 5–7 oblique teeth as long as width of spur; claws simple.

Colouration. Head and mesosoma black, except legs and flagellum dark brown; mandible apically dark red, short pre-apical region amber; tegula transparent brown; metasoma orange-brown with extensive dark brown markings, T2 with dark, oval marks laterally.

Pubescence. Hair on clypeus sparse, white, with open, short branching, 2×MOD; lower paraocular areas and gena with open, white hair, more closely branched, 2×MOD; scutal and scutellar hair open, dark brown, weakly branched or simple, 1–1.5×MOD; hair on the sides of mesosoma white, finely branched, ca 2×MOD; hair of hind tibial scopa open, brown, pectinate with long branches becoming weakly branched on the rear margin; metasomal hair sparse dorsally except for dense, dark brown prepygidial fimbria; apical margins of metasomal sterna S2–S4 with open rows of white, weakly branched hair, 2×MOD, S5 & S6 with dense, golden-brown apical fringes.

Sculpture. Clypeus with strong, large punctures, i=1–2d, with polished, but weakly reticulate interspaces; supraclypeal area medially shiny, lateral faces with small punctures; lower paraocular areas with medium to small punctures, i=1–3d, with reticulate interspaces; frons vertically rugose, with strong reticulation and close small punctures, i≈d; punctures of scutum and scutellum small, weak, obscured by strong reticulation; propodeal triangle more coarsely reticulate, peripheral suture weak with anterior ends with wide, weakly scrobiculate sulci; metasomal terga with scattered setiferous

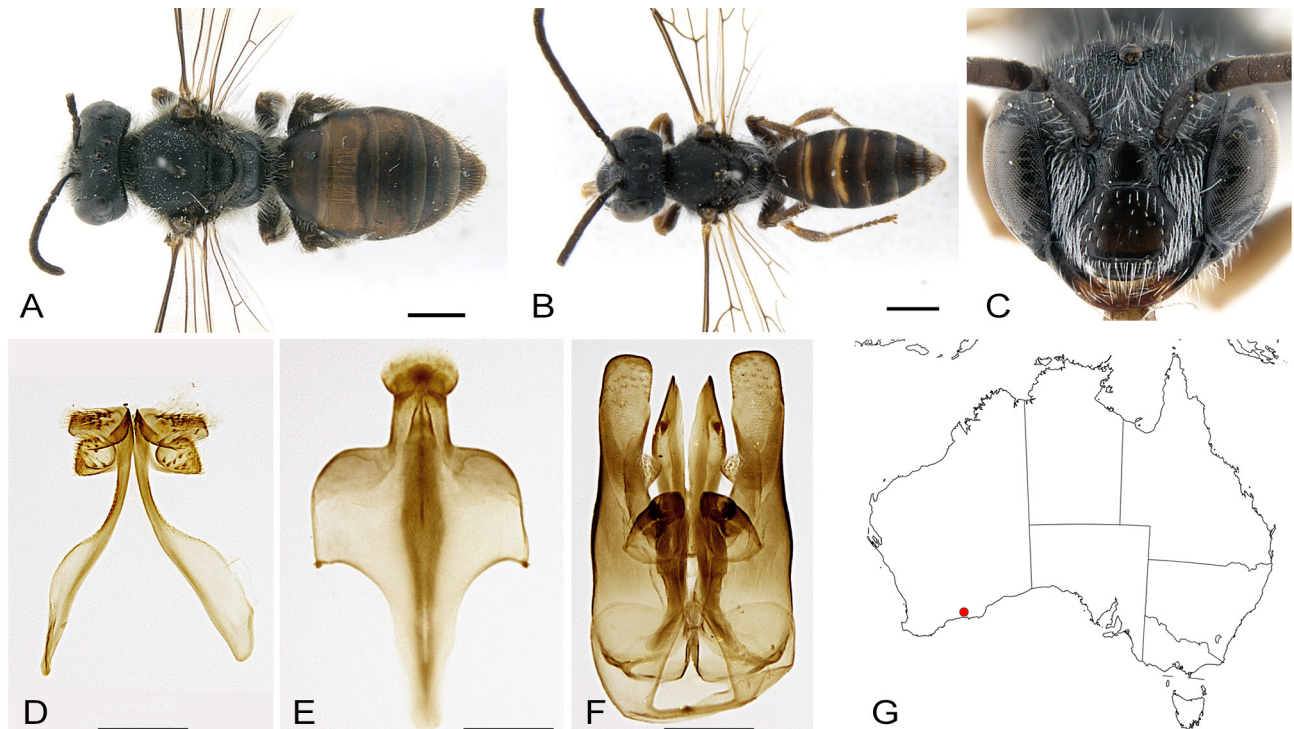


Figure 23. *Leioproctus* (*Euryglossidia*) *diloris* sp. nov.: A, ♀ dorsal view; B, ♂ dorsal view; C, ♂ face; D–F, ♂ terminalia ventral views; G, collection locations. Scale bars: A, B, 1 mm; D–F, 500 µm.

punctures, denser towards prepygidial fimbria.

Note. Morphologically similar to *australiensis* but so far known only from the opposite side of the continent. The species share similar male terminalia, colour of the female metasoma, clypeus shiny relative to other areas and sparsely hairy.

Etymology. The specific epithet is a Latin adjective meaning two-striped referring to the banding pattern on the male metasoma.

Leioproctus (Euryglossidia)

edentatus sp. nov.

urn:lsid:zoobank.org:act:837384D8-7887-49E1-A197-4165B28490A1

Fig. 24

Holotype. ♂, Glen Forrest, WA (31.911°S 116.099°E), 25 Aug 1976, S.M. Postmus, on *Hakea amplexicaulis*, WAM 12123.

Paratypes. 9♀ 3♂, same collection data as holotype, WAM 12108–18, 20.

Other specimens examined: 2♀ 10♂, same location and collector as holotype, 1 Aug & 24 Aug 1976, on *Hakea amplexicaulis* & *Hakea bipinnatifida* WAM 1219, 21, 24–33.

Diagnosis. Small, head and mesosoma black, metasoma brown dorsally, paler ventrally (particularly for male), anterior faces of tibiae and basitarsi yellow brown, frons striate (irregularly for female), clypeal punctures close with weakly (female) or strongly (male) reticulate interspaces, female claws simple without inner tooth.

Description of male. Body length 6.0 mm. Relative head measurements: HW 100; HL 76; UFW 66; LFW 54; CL 27; FL 164; SL 30.

Inner orbits ventrally convergent; clypeus and supraclypeal area gently convex, supraclypeal area without distinct lateral surfaces; frontal carina extends about $\frac{2}{3}$ of way to median ocellus; flagellum long, segments fl2–fl10 not quite twice as long as wide; gena *ca* half as wide as compound eye viewed laterally; claws cleft.

Colouration. Head and mesosoma black with a weak brassy sheen, except flagellum and tegula dark brown, legs dark brown with anterior faces of fore and mid tibiae and tarsi yellow-brown, apex of mandible dark red with short amber region pre-apically; metasoma dorsally dark brown, T3–T5 with bluish iridescent sheen, ventrally largely yellow-brown; prepygidial fimbria dark brown.

Pubescence. Hair on clypeus, paraocular areas, lower frons and scape erect, white, closely-branched, $2\times$ MOD; hair on scutum sparse, brown, minutely branched, $1-2\times$ MOD; hair on mesepisternum open, white, plumose, $3\times$ MOD; metasomal hair sparse.

Sculpture. Punctures on clypeus and supraclypeal area small, $i=2-5d$, with strongly reticulate interspaces; frons as for female except striae distinct around median ocellus; punctures on scutum small, $i=3-5d$; propodeal triangle reticulate, peripheral sulcus indistinct; metasomal terga finely reticulate.

Description of female. Body length 5.9 mm. Relative head measurements: HW 100; HL 76; UFW 68; LFW 60; CL 26; FL 82; SL 31.

Inner orbits nearly parallel; clypeus and supraclypeal area convex; mandible bidentate, smoothly curved; frontal carina extends *ca* half way to median ocellus; flagellum moderately short, segments fl1–fl8 shorter than wide; inner hind tibial spur distinctly shorter than outer spur, inner hind tibial spur

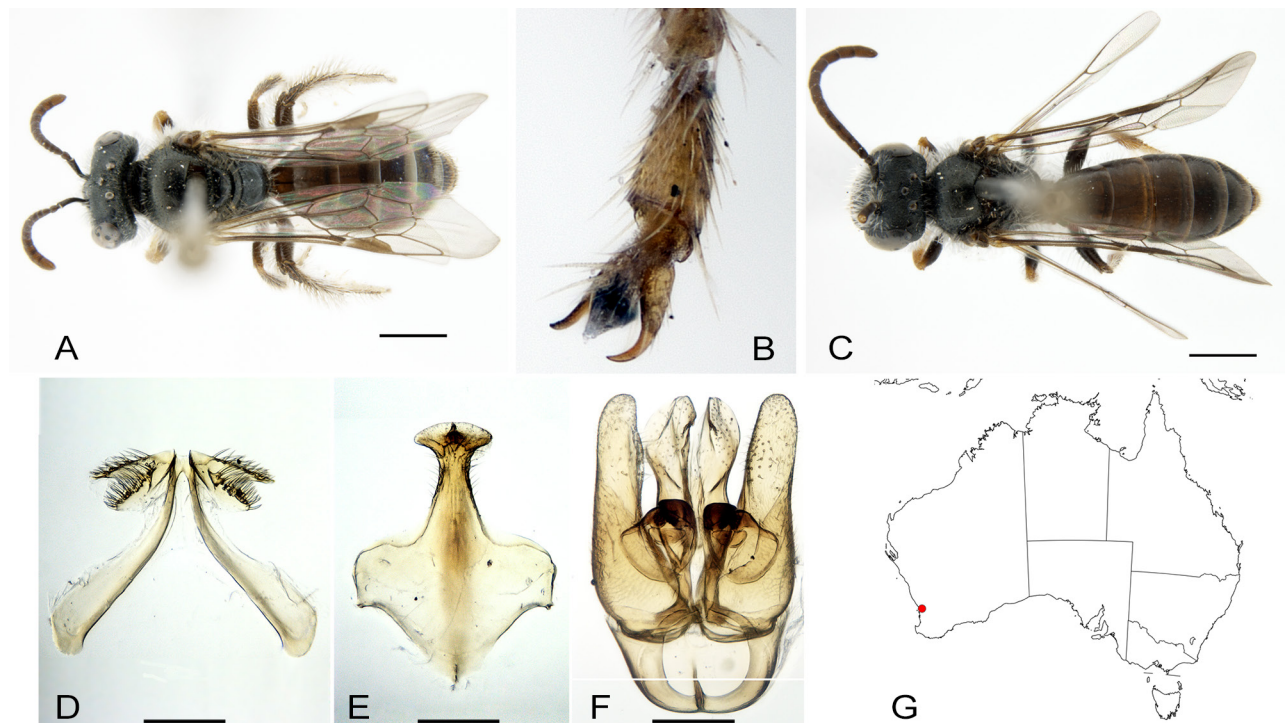


Figure 24. *Leioproctus (Euryglossidia) edentatus* sp. nov.: A, ♀ dorsal view; B, ♀ hind claw; C, ♂ dorsal view; D–F, ♂ terminalia ventral views; G, collection locations. Scale bars: A, C, 1 mm; D–F, 200 µm.

with 4 oblique teeth shorter than width of spur; claws simple.

Colouration. Head and mesosoma black with a weak brassy sheen, except flagellum and tegula dark brown, legs dark brown with anterior faces of fore and mid tibiae and tarsi yellow-brown, apex of mandible dark red with short amber region pre-apically; metasoma dark brown, T3–T5 with bluish iridescent sheen; prepygidial fimbria dark brown.

Pubescence. Hair on clypeus, paraocular areas, lower frons and gena open, white, openly-branched, $2\times\text{MOD}$; hair on scutum open to sparse, erect, brown, openly-branched, $0.5\text{--}1.0\times\text{MOD}$; hair on mesepisternum white, openly-branched, $ca\ 3\times\text{MOD}$; hair of hind tibial scopa sparse, white, weakly bipectinate on anterior margin becoming translucent brown, weakly pectinate on posterior margin; metasomal terga sparsely hairy with prepygidial fimbria reduced to a few short simple setae; hair on apical $\frac{1}{2}$ of metasomal sterna S2–5 erect, white, weakly pectinate, $2\text{--}4\times\text{MOD}$; S5 and S6 with dense apical fringes.

Sculpture. Clypeus and supraclypeal area with mid-sized and small punctures, $i=1\text{--}2d$, with weakly reticulate interspaces; frons strongly reticulate with weak punctures and irregular fine rugae; punctures on scutum and scutellum small, $i=3\text{--}5d$, with reticulate interspaces, weaker on scutellum; propodeal triangle more coarsely reticulate, peripheral sulcus shallow, scrobiculate along subhorizontal section; metasomal terga with satin lineo-reticulation.

Etymology. The specific epithet is a Latin adjective referring to the absence of an inner tooth on the claws of the female.

Leioproctus (*Euryglossidia*)

euscopatus sp. nov.

urn:lsid:zoobank.org:act:D70CE963-AF30-4140-AC04-E28E9E84D6BD

Fig. 25

Holotype. ♀, Mullion Range FR, NSW (33.177°S 149.177°E), 13 Sep 2002, M. Batley, on *Leucopogon microphyllus*, AMS K.396049.

Paratypes. 3♀, 2♂, same location as holotype, 13 Sep 2002, 27 Sep & 1 Oct 2005, AMS K.396048, K.361096, K.540352, K.362575 & K.220773.

Other specimens examined: 7♀ 12♂, Mount Tomah, NSW (33.544°S 150.421°E), 20–31 Jul & Aug 4–21, 1977, 19 Jul, 10 & 25 Aug 1978, N. W. Rodd, AMS K.396074–86, 88–91, 94, 95; 2♀, Haystack Ridge, NSW (33.52°S 150.41°E), 31 Jul 1978, N.W.Rodd, AMS K.396092, 3; 1♀, 3 km S Mount Wilson, NSW (33.51°S 150.36°E), 5 Aug 1978, N. W. Rodd, AMS K.396094; 1♀, Nadgee Reserve, NSW (37.34°S 149.94°E), 8 Sep 1985, R. W. Thorp, AMS K.95572; 1♀, Boulder Flat, NSW (30.571°S 152.269°E), 12 Oct 2001, P. Bernhardt, on *Trimenia moorei*, AMS K.396097.

Diagnosis. Mid-sized, head and mesosoma black, metasoma red-brown with darker suffusions (female), or dark red-brown (male), frons scabrous, scutum reticulate, propodeal triangle without rugae, hair of female hind tibial scopa close to dense, male clypeus with sparse, plumose hair, length $>\text{MOD}$, interspersed with longer dark setae.

Description of female. Body length $ca\ 7.5$ mm. Relative head measurements: HW 100; HL 80; UFW 75; LFW 61; CL 25; FL 85; SL 40.

Clypeus with wide marginal area; subantennal sutures long; mandible bidentate, smoothly curved; flagellum short, segments fl2–fl9 about as long as wide; gena, viewed laterally, narrower than compound eye; inner hind tibial spur with 4–6 teeth as long as width of spur; claws with large subapical inner tooth.

Colouration. Head and mesosoma black, metasoma red-brown with irregular dark brown suffusions, T2 laterally with large, dark marks; mandible with red-brown

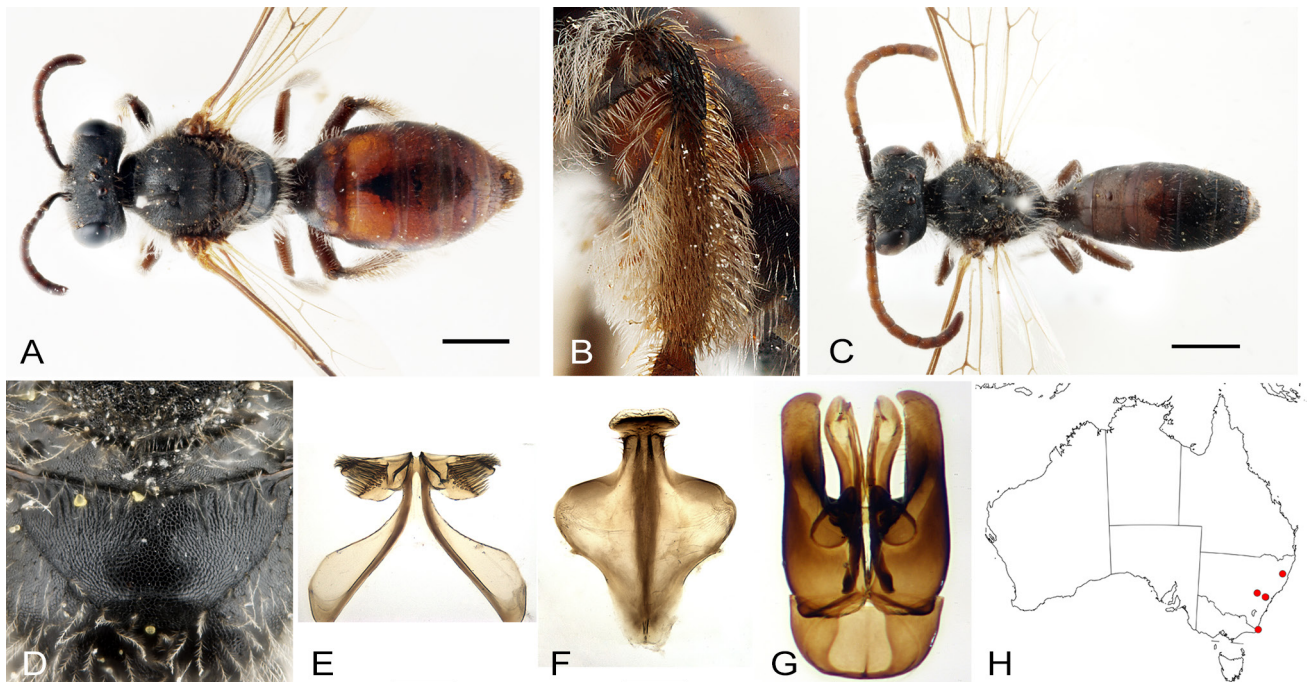


Figure 25. *Leioproctus* (*Euryglossidia*) *euscopatus* sp. nov.: A, ♀ dorsal view; B, ♀ hind tibial scopa; C, ♂ dorsal view; D, ♀ propodeal triangle; E–G, ♂ terminalia ventral views; H, collection locations. Scale bars: A, C, 1 mm; E–G, 200 μm .

tip; flagellum dark brown dorsally, paler ventrally; tegulae transparent brown.

Pubescence. Hair on clypeus, lower paraocular areas and lower frons open, white, plumose, 1–1.5×MOD, interspersed with dark, simple setae, ≤3×MOD; on upper frons fine, mostly simple; on gena open, white, plumose, 1×MOD; on scutum and scutellum brown, plumose, erect, *ca* 0.5×MOD, interspersed with sparse, simple setae, 2×MOD; on the sides of mesosoma white, plumose, *ca* 3×MOD; hair of hind tibial scopa close, white, bipectinate on anterior edge becoming dark brown, pectinate posteriorly with a few simple setae near the basitibial plate; prepygidial fimbria dark brown, apical half to one third of metasomal sterna S2–S4 with white, erect hair, 2–3×MOD, S5, S6 with dense, golden-brown, apical fringes.

Sculpture. Basal half to two thirds of clypeus with large, dense punctures and reticulate interspaces, towards ventral margin interspaces wider and shining; punctures on lower paraocular areas weak, small to mid-sized, *i*=*d*; on frons small, *i*≈2*d*, obscured by reticulation; on scutum and scutellum punctures obscured by strong reticulation; propodeal triangle weakly shining with coarser reticulation and a few rugae in anterolateral corners, peripheral suture indistinct; metasomal terga with sparse setiferous punctures becoming denser near fimbria.

Description of male. Body length *ca* 7.0 mm. Relative head measurements: HW 100; HL 82; UFW 70; LFW 53; CL 24; FL 160; SL 35.

Inner orbits converging ventrally, sub-antennal sutures about as long as interantennal distance, flagellum long with segments fl2–fl10 *ca* 1.5 times as long as wide, mandible bidentate, smoothly curved; tibiae and tarsi slender, claws cleft.

Colouration. Head and mesosoma black except tip of mandible red, metasoma, legs and flagellum orange-brown or dark brown, scape ventrally and anterior face of fore tibia yellow-brown and claws amber; tegulae transparent brown.

Pubescence. Hair of clypeus and lower paraocular areas white, open, tightly branched, >MOD, interspersed with simple, brown setae, 2–3×MOD; on frons fine, brown, mostly simple, 1×MOD; on scutum dark brown, erect, weakly-branched or simple, 2–3×MOD; on fore trochanter, femur and sides of mesosoma white, plumose, 3×MOD; metasomal hair sparse apart from apical fringes on S4, S5.

Surface sculpture. All surfaces of head and mesosoma strongly reticulate and dull; propodeal triangle as for female; metasoma and legs reticulate but weakly shiny.

Variation. Males from Mullion Range lack yellow brown on scape and fore tibia.

Etymology. The specific epithet is a Latin adjective referring to the relatively dense hind tibial scopa of the female.

Leioproctus (Euryglossidia) *flavimandibulatus* sp. nov.

urn:lsid:zoobank.org:act:4708B91C-3777-42F8-B652-D0CF309F9849

Fig. 26

Holotype. ♂ Mount Gibson, WA (29.750°S 117.403°E), 25 Aug 2001, R. Leys, on *Grevillea*, SAMA 32-44695.

Paratypes. 3♀ 5♂, collection data as for holotype SAM; 2♀, Lochada, WA (29.095°S 116.547°E), 17 Sep 2009, R. Leys, on *Calycopeplus paucifolius*, SAM 32-40054, 5; 2♀, Kadji Kadji, WA (29.099°S 116.313°E), 15 Sep 2009, R. Leys, on *Calycopeplus paucifolius*, SAM 32-40062, 3.

Diagnosis.

Small, black with brassy sheen on head and mesosoma, frons finely striate, scutum strongly reticulate, propodeal triangle without rugae, female mandible orange or yellow, female scutum with short, tightly branched dull gold hair, length male flagellum ≈ head width.

Description of male. Body length *ca* 5.5 mm. Relative measurements: HW 100; HL 72; UFW 62; LFW 50; CL 23; FL 105; SL 28.

Inner orbits ventrally convergent; mandible bidentate, smoothly curved; clypeus and supraclypeal area gently convex; frontal carina extending half way to median ocellus; flagellum moderately long, segments fl3–fl10 about as long as wide.

Colouration. Black with head and mesosoma weakly brassy, mandible black with dark red tip; flagellum dark brown dorsally, yellow-brown ventrally; legs dark brown except fore tarsus and anterior face of fore tibia yellow-brown, remaining tarsi with small areas of yellow-brown; metasoma black, with T5 brassy.

Pubescence. Hair of clypeus, supraclypeal and paraocular areas and lower frons close, white, finely branched, 2×MOD; hair on frons, vertex and scutum sparse, erect, with minute branching, 2×MOD; hair on mesepisternum and sides of propodeum white, finely branched, 3×MOD; hair on metasoma dorsally sparse, except for adpressed white hair on the ventrally facing, lateral margins of T2–T4; sterna S4, S5 have weak, white, apical fringes shortest medially.

Sculpture. Punctures of clypeus, paraocular and supraclypeal areas mid-sized, *i*≈*d*, with reticulate interspaces; frons, ocellular area and interocellar area finely striate, punctures small, shallow, *i*=1–2*d*; punctures of scutum and scutellum small, *i*=2–5*d*; propodeal triangle more coarsely reticulate, peripheral suture weak.

Description of female. Body length *ca* 6 mm. Relative measurements: HW 100; HL 71; UFW 66; LFW 59; CL 25; FL 59; SL 31.

Head wide, inner orbits ventrally convergent; mandible bidentate, smoothly curved; clypeus convex, supraclypeal area prominent with distinct dorsolateral and anterior faces; frontal carina strong, reaching half way to median ocellus; flagellum short, segments fl2–fl7 shorter than width; gena a little more than half as wide as compound eye viewed laterally; inner hind tibial spur with *ca* 7 teeth, half as long as width of spur; claws simple.

Colouration. Black with head and mesosoma weakly brassy, mandible orange with dark red tip; flagellum dark brown dorsally, orange-brown ventrally, legs dark brown proximally, tibiae and tarsi orange-brown with darker infuscation, metasoma black, with T4 & T5 brassy.

Pubescence. Hair of clypeus, supraclypeal and paraocular areas and lower frons close, white, tightly-branched, 2×MOD; scutum and scutellum with close, dull yellow-brown, tightly-branched tomentum, 0.5×MOD, interspersed with dark brown, erect setae; hair of mesepisternum white, minutely-branched, ~2×MOD; hair of hind tibial scopa

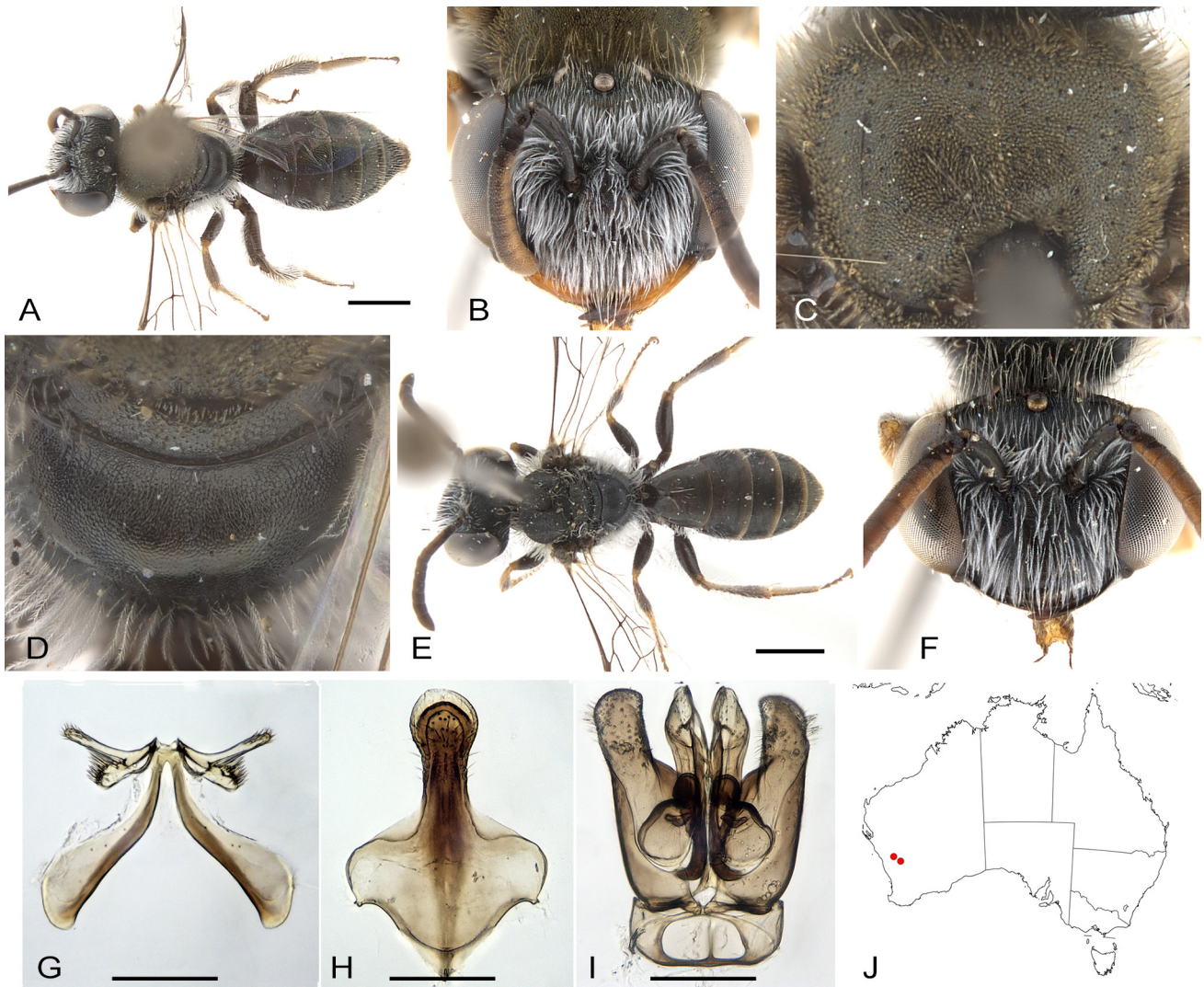


Figure 26. *Leioproctus* (*Euryglossidia*) *flavimandibulatus* sp. nov.: A, ♀ dorsal view; B, ♀ face; C, ♀ scutum; D, ♀ propodeal triangle; E, ♂ dorsal view; F, ♂ face; G–I, ♂ terminalia ventral views; J, collection locations. Scale bars: A, E, 1 mm; G–I 200 µm.

sparse, long, white, openly bipectinate with some wrinkled tips on anterior half, shorter, mid-brown, unbranched on posterior half; metasomal hair sparse dorsally apart from mid-brown prepygidial fimbria; hair of metasomal sterna S2–S5 open, white, erect, plumose, 2–3×MOD; apical fringes of S5, S6 dense, 2×MOD.

Sculpture. Punctures of clypeus, paraocular and supraclypeal areas mid-sized, $i < d$, with reticulate interspaces; frons, ocellocular area and interocellar area finely striate, punctures small, shallow, $i=1-2d$; punctures of scutum and scutellum mid-sized, $i=1-3d$; propodeal triangle more coarsely reticulate, peripheral suture weak.

Etymology. The specific epithet is a Latin adjective referring to the yellow mandible of the female.

Leioproctus (*Euryglossidia*)

flavipedatus sp. nov.

urn:lsid:zoobank.org:act:7A613652-C14D-4DF4-9F65-C7F44B15145F

Fig. 27

Holotype. ♂ Durokoppin NR, WA (31.410°S 117.768°E), 12 Sep 1986, on *Grevillea paniculata*, T.F. Houston, WAM 20713.

Paratypes. 5♀, 7♂ collection data as for holotype, WAM 20702–14.

Other specimens examined: ♀, Sandford Rocks, WA (31.233°S 118.767°E), 17 Sep 1984, R.P. McMillan, on *Hakea*, WAM 20829; 6♀, Minnivale, WA (31.139°S 117.181°E), L. Glauert, WAM 20795–800; 3♀, Wamenusking, WA (32.146°S 117.584°E), L. Glauert, WAM 20801–03; ♀, Dingo Rock Reserve, Wongan Hills, WA (30.862°S 116.973°E), 31 Aug 1991, R.P. McMillan, WAM 19144.

Diagnosis. Small, black with brassy sheen on head and mesosoma, frons finely striate, scutum strongly reticulate, propodeal triangle without rugae, fore basitarsus yellow-brown, female mandible mostly black and scutal hair sparse, weakly branched, male flagellum almost twice as long as head width.

Description of male. Body length 5.8 mm. Relative head measurements: HW 100; HL 80; UFW 66; LFW 53; CL 27; FL 180; SL 28.

Inner orbits convergent ventrally; clypeus transversely convex, longitudinally strongly convex close to marginal area; supraclypeal area smoothly convex; mandible bidentate, smoothly curved; frontal carina extends about half way to median ocellus; flagellum long, subgeniculate, segments fl2–fl11 longer than wide; width of gena $ca \frac{3}{4}$ as wide as compound eye viewed laterally; length of first abscissa of posterior margin of second submarginal cell of forewing less than half length of first submarginal crossvein; claws cleft.

Colouration. Head and mesosoma black except clypeus, supraclypeal area, frons, scutum and propodeal triangle weakly brassy, flagellum dark brown dorsally, yellow-brown ventrally, tegulae transparent brown, legs dark brown with fore tarsi yellow, anterior faces of fore and mid tibia dull yellow-brown or orange-brown, mandible with dark red tip and short amber section pre-apically, metasomal terga dark brown with translucent apical margins, metasomal sterna mostly yellow-brown.

Pubescence. (Hair on specimen may be worn.) Hair on clypeus, paraocular areas, lower frons and gena open to sparse, erect, white, closely branched $1-2 \times \text{MOD}$; on scutum sparse, white, simple, $2-3 \times \text{MOD}$; on mesepisternum open, white, closely branched, $2 \times \text{MOD}$; metasoma dorsally with sparse hair, except for weak prepygidial fimbria; metasomal sterna with sparse hair apart from weak apical fringes on S4 and S5.

Sculpture. Punctures on clypeus small, $i=1-2d$, with reticulate interspaces; supraclypeal area with small punctures laterally, impunctate but reticulate medially; frons with a combination of small punctures, $i=1-2d$, and strong reticulation; punctures on scutum small, $i=2-3d$, with reticulate interspaces; scutellum largely polished with some small punctures medially and reticulation along posterior margin; propodeal triangle more coarsely reticulate, with wide, scrobiculate sulcus weakly indicated in anterolateral

corners; metasomal terga as for female.

Description of female. Body length 6.0 mm. Relative head measurements: HW 100; HL 80; UFW 70; LFW 59; CL 28; FL 81; SL 35.

Inner orbits convergent ventrally; clypeus transversely convex, longitudinally strongly convex close to marginal area; supraclypeal area prominent, anterior surface slightly convex; mandible bidentate, smoothly curved; frontal carina extends about half way to median ocellus; flagellum short, segments fl2–fl8 shorter than wide; width of gena $ca \frac{3}{4}$ as wide as compound eye viewed laterally; length of first abscissa of posterior margin of second submarginal cell of forewing about half length of first submarginal crossvein; inner hind tibial spur with 6 teeth about as long as width of spur; claws simple.

Colouration. Head and mesosoma black except frons, scutum and propodeal triangle weakly brassy, flagellum dark brown dorsally, yellow-brown ventrally, tegulae transparent brown, legs dark brown with fore tarsi yellow, anterior faces of fore and mid tibia yellow-brown or orange-brown, mandible with dark red tip and short amber section pre-apically, metasomal terga with fine reticulation but shiny.

Pubescence. Hair on clypeus, paraocular areas, lower frons and gena open to sparse, erect, white, closely branched $1-2 \times \text{MOD}$; on scutum open, pale brown, minutely branched, $ca 1 \times \text{MOD}$, interspersed with a few longer, dark hairs; on mesepisternum open, white, closely branched, $2 \times \text{MOD}$; hind tibial scopa with sparse hair white, bipectinate on anterior margin, white or brown, openly pectinate on posterior margin; metasoma dorsally with sparse hair, except for weak prepygidial fimbria; metasomal sterna S2–S5 with rows of erect, white, openly pectinate hair, $2 \times \text{MOD}$; S5 and S6 with dense apical fringes.

Sculpture. Punctures on clypeus large, irregular in shape and unevenly distributed, $i=0.1-1d$, with polished

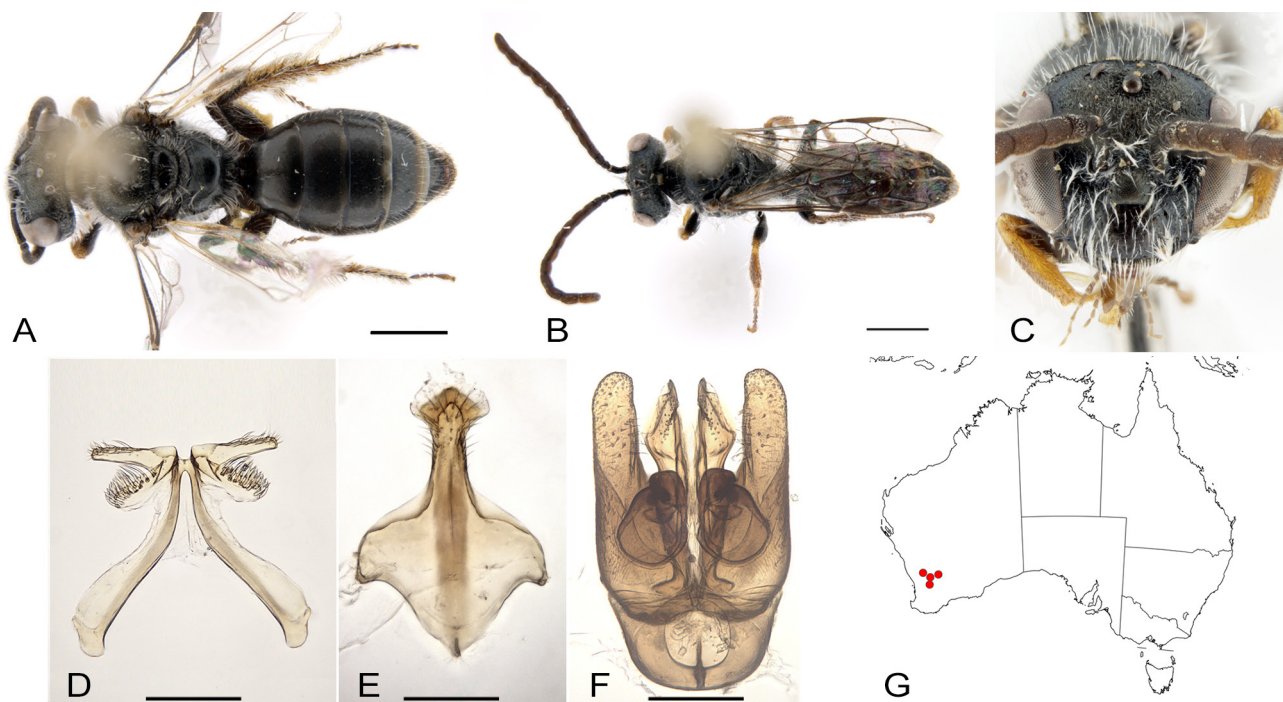


Figure 27. *Leioproctus (Euryglossidia) flavipedatus* sp. nov.: A, ♀ dorsal view; B, ♂ dorsal view; C, ♂ face; D–F, ♂ terminalia ventral views; G, collection locations. Scale bars: A, B, 1 mm; D–F, 200 µm.

interspaces; supraclypeal area with contiguous small punctures on lateral faces, almost impunctate, polished on anterior face; frons with a combination of small punctures, $i=1-2d$, vertical rugae and strong reticulation; punctures on scutum small, $i=1-2d$, with reticulate interspaces; scutellum largely polished with some punctures and reticulation medially and along posterior margin; propodeal triangle more coarsely reticulate, peripheral suture weakly indicated; metasomal terga with fine reticulation but shiny, any punctures sparse and tiny.

Etymology. The specific epithet is a Latin adjective referring to the yellow-brown fore basitarsus.

Leioproctus (*Euryglossidia*)

gaudii sp. nov.

urn:lsid:zoobank.org:act:1111E449-F913-4BF0-B70D-08BAE564A3A4

Fig. 28

Holotype. ♀ Cocoparra NP, NSW (34.129°S 146.195°E), 13 Sep 2011, on *Leptospermum divaricatum* (now *Gaudium divaricatum*), M. Batley, AMS K.361292.

Paratypes. 2♀, collection data as for holotype, AMS K.361293, 4.

Other specimens examined: 2♀, Cocoparra NP, NSW (34.19°S 146.24°E), 19–22 Sep 1980, N.W. Rodd, AMS K.396071, 2; ♀, 20 km S Rankins Springs, NSW (34.0°S 146.2°E), 23 Sep 1980, N.W. Rodd, AMS K.396073.

Diagnosis. Moderately large, head and mesosoma black, metasoma black with faint bluish or brassy iridescence, frons scabrous, scutum strongly reticulate, clypeal punctures large, $i=0.5d$, with polished interspaces, inner hind tibial spur with three well-spaced, long teeth.

Description of female. Body length *ca* 9.3 mm. Relative head measurements: HW 100; HL 80; UFW 71; LFW 63; CL 33; FL 77; SL 35.

Inner orbits parallel; mandible bidentate, smoothly curved; clypeus convex; flagellum moderately long, segments fl2–fl7 *ca* as long as wide; gena about as wide as compound eye viewed laterally; inner hind tibial spur with *ca* 3 coarse, widely-spaced teeth longer than basal width of spur; claws with subapical inner tooth.

Colouration. Black except metasomal T3–T5 faintly bluish, apical margins weakly bronze; tibiae and tarsi dark

brown with inner faces of fore and hind tibiae orange-brown; ventral surface of flagellum dark brown; tegulae transparent dark brown.

Pubescence. Hair on lower face sparse, white, weakly-branched, $2\times\text{MOD}$ interspersed with simple setae; hair on frons fine, mid brown, with a few minute branches, $1\times\text{MOD}$; lateral hair of mesosoma white, plumose, $3-4\times\text{MOD}$. Hind tibial scopal hair close, white or very pale brown, mostly pectinate, but bipectinate on anterior margin and simple near the basitibial plate. Hair on metasomal terga sparse apart from mid-brown hair of the prepygidial fimbria; hair of apical $\frac{1}{3}$ of metasomal sterna S2–S5 close, plumose, white, $2-3\times\text{MOD}$; apical fringes on S5, S6 dense, $2\times\text{MOD}$.

Sculpture. Clypeal punctures large, $i=0.5d$, medially with polished interspaces; anterior face of supraclypeal area impunctate; punctures of lower paraocular areas medium, dense, $i<d$; punctures on frons shallow, obscured by reticulation; punctures of scutum and scutellum small, weak, $i\approx d$, interspaces strongly reticulate; propodeal triangle more coarsely reticulate, anterolateral corners with broad shallow sulcus crossed by weak, curved rugae; metasoma finely lineo-reticulate with indistinct tiny punctures, tergal apical margins bronze.

Male. Unknown.

Etymology. The specific epithet refers to the flower from which the known specimens were collected. The small number of specimens means that the species may well visit other flowers, but the name serves to distinguish it from *amblycladus*, which was collected from *Grevillea* in a nearby area.

Leioproctus (*Euryglossidia*)

goonooensis sp. nov.

urn:lsid:zoobank.org:act:58D26C66-F333-41AF-9DF0-094113C1B970

Fig. 29

Holotype. ♂ Goonoo SCA, 6 km SW Mendooran, NSW (31.874°S 149.092°E), 5 Sep 2016, M. Batley, on *Boronia glabra*, AMS K.516788.

Paratypes. 5♂ collection data as for holotype, AMS K.516789–93; 1♀, Goonoo Forest, 8 km S Mendooran, NSW (31.88°S 149.08°E), 4 Sep 1976, G. Daniels, K.593228.



Figure 28. *Leioproctus* (*Euryglossidia*) *gaudii* sp. nov. ♀: A, dorsal view, scale bar 1 mm; B, scutum lateral view; C, inner hind tibial spur; D, collection locations.

Diagnosis. Mid-sized, black with slight brassy iridescence, metasomal terga with translucent apical margins, frons closely punctate to areolate, scutum strongly reticulate, propodeal triangle without rugae, resembles *arenarius* but larger, female scutal hair shorter, $0.5 \times \text{MOD}$ and mostly simple, male with dark flagellum and fore basitarsus and anterior lobes of male S7 shorter and more triangular.

Description of male. Body length 5.8 mm. Relative head measurements: HW 100; HL 90; UFW 65; LFW 51; CL 34; FL 140; SL 33; SW 7.

Inner orbits ventrally convergent; mandible bidentate, smoothly curved; clypeus and supraclypeal area transversely convex; frontal carina extending a little over halfway to median ocellus; flagellum moderately long, all segments longer than wide.

Colouration. Black except: frons, scutum, propodeum and metasoma slightly brassy, mandible dark red apically, short subapical region amber, tegula translucent brown, hind basitarsus yellow-brown, remaining tibiae and tarsi dark brown, marginal areas of metasomal terga weakly bronze.

Pubescence. Hair on clypeus, paraocular and interantennal areas close, silvery-white, finely branched, $2.5 \times \text{MOD}$; on gena close, erect, white, plumose, $2 \times \text{MOD}$; on scutum sparse, erect, brown, weakly branched, *ca* $2 \times \text{MOD}$; on sides of propodeum white, plumose, $2-3 \times \text{MOD}$; metasomal hair sparse except for white apical fringe, $2 \times \text{MOD}$ laterally, $1 \times \text{MOD}$ medially on sternum S5, and slightly shorter fringe on S4.

Sculpture. Integument dull with moderately strong reticulation except weaker on clypeus and supraclypeal area; clypeus and supraclypeal area with small punctures, $i=1-2d$ and weakly reticulate interspaces; frons areolate; scutal punctures small, $i=1-4d$ with strongly reticulate interspaces; propodeal triangle reticulate, peripheral suture weakly marked except for broad, scrobiculate sulcus along basal $\frac{1}{4}$; metasoma with

satin lineo-reticulation.

Description of female. body length 6.9 mm. Relative head measurements: HW 100; HL 71; UFW 66; LFW 58; CL 29; FL 76; SL 31.

Inner orbits ventrally convergent; mandible bidentate, smoothly curved; clypeus gently convex transversely convex, ventral $\frac{1}{3}$ more strongly convex longitudinally; frontal carina extending $\frac{2}{3}$ of the distance to median ocellus, upper $\frac{1}{3}$ replaced by a polished sulcus; flagellum of moderate length, segments fl4–fl9 about as long as wide.

Colouration. Black except frons, scutum, scutellum and metanotum slightly brassy, mandible dark red apically, tegula translucent brown, legs dark brown, metasoma dark brown.

Pubescence. Hair on clypeus open to sparse, white, plumose, $2 \times \text{MOD}$; paraocular area, lower frons and gena with open to close, similar hair; hair on scutum close, erect, brown, unbranched, $0.5 \times \text{MOD}$, interspersed with longer, dark setae; on sides of mesosoma open, white, openly branched, $2-3 \times \text{MOD}$; hair of hind tibial scopa white, openly branched, bipectinate with a few crinkled tips on anterior half, pectinate on posterior half; metasomal terga with sparse hair except for golden brown prepygidial fimbria; most of S2 and marginal areas of S3 & S4 with erect, white openly branched hair $2-3 \times \text{MOD}$, S5 with a white apical fringe $1 \times \text{MOD}$.

Sculpture. Clypeus and supraclypeal area with small punctures, $i=1-2d$ and weakly reticulate interspaces; frons areolate; scutal punctures small, $i=1-4d$ with strongly reticulate interspaces; propodeal triangle reticulate, peripheral suture indistinct; metasoma with satin lineo-reticulation.

Etymology. The specific epithet refers to the type locality.

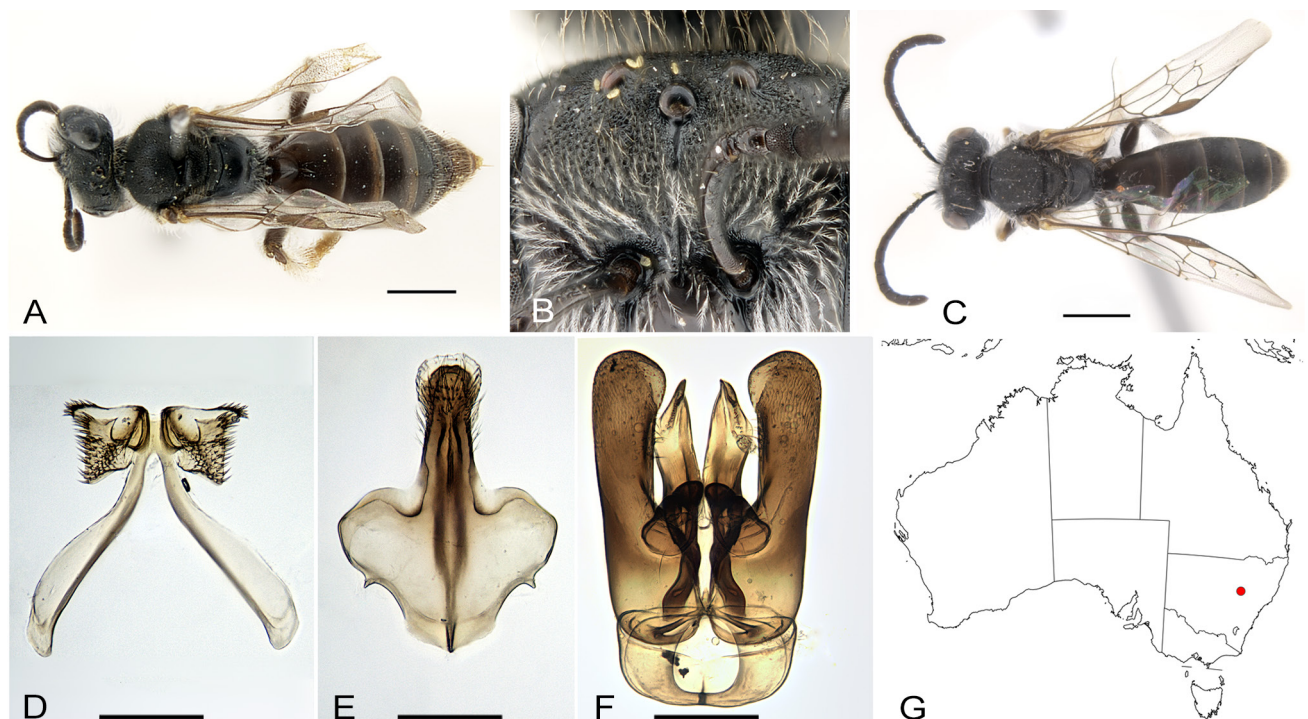


Figure 29. *Leioproctus (Euryglossidia) goonooensis* sp. nov.: A, ♀ dorsal view; B, ♀ frons; C, ♂ dorsal view; D–F, ♂ terminalia ventral views; G, collection locations. Scale bars: A, C, 1 mm; D–F, 200 μm .

Leioproctus* (*Euryglossidia*) *halictiformis
(Smith, 1879)

Fig. 30

Euryglossa halictiformis Smith, 1879: 15.

Leioproctus (*Euryglossidia*) *halictiformis*—Michener, 1965: 69.

Holotype. ♀ Swan River, WA, BMNH Hym.17.a.249—examined using Portal images and specifically requested images provided by NHM.

Other specimens examined: 4♀, Thundelarra Stn, Meleya Well, WA (28.959°S 117.200°E), 28 Aug–2 Sep 1981, T.F. Houston, *Angianthus micropodiodes*, WAM 10719–22.

Diagnosis. Small, head and mesosoma black, metasoma dark brown, frons areolate, scutum densely punctate with weakly reticulate interspaces and close cover of golden-brown hair (<1×MOD), propodeal triangle with short rugae basally, hind basitibial plate with golden setae.

Description of female. Body length 6.0 mm. Relative head measurements: HW 100; HL 70; UFW 69; LFW 61; CL 26; FL 58; SL 26.

Inner orbits subparallel, clypeus and supraclypeal area gently convex, mandible bidentate, smoothly curved, frontal carina extends less than half way to median ocellus; flagellum short, segments fl2–fl9 shorter than wide; inner hind tibial spur with 6 apically hooked teeth about as long as width of spur; claws with small, sharp, medial tooth.

Colouration. Head and mesosoma black except flagellum dorsally dark brown with fl10 orange-brown, ventrally yellow-brown, tegulae transparent amber, legs mostly mid-brown with yellow-brown basitarsi, hind basitibial plate densely covered with golden setae; apical half of mandible amber with dark red tip; metasomal terga dark brown to black

with translucent apical margins on T2, T3, sterna mottled brown; prepygidial fimbria pale yellow.

Pubescence. Hair on clypeus, supraclypeal area, paraocular areas, lower frons and gena close, white, closely branched, 1–2×MOD; hair on scutum open to close, brown, finely branched, <1×MOD, interspersed sparsely with similar setae *ca* 2×MOD; hair on mesepisternum open, white, plumose, 2×MOD; hind tibial scopa open, with white bipectinate hair on anterior margin and white pectinate hair on posterior margin; metasomal terga with sparse hair, except on ventrally facing lateral margins T2–T4 and pale yellow prepygidial fimbria; metasomal sterna S2–S5 with close rows of erect, white, weakly branched hair, 2×MOD; S5, S6 with relatively weak apical fringes, 2×MOD.

Sculpture. Punctures on clypeus small basally, mid-sized apically, $i < d$, with weakly to moderately reticulate interspaces; supraclypeal area similar with $i = 1-2d$; frons sculpture unusual and complex, interpreted by examination of marginal areas as mid-sized punctures, $i \leq d$, with moderately reticulate interspaces combined with vertical rugae; punctures on scutum and scutellum small, $i < 0.5d$; propodeal triangle reticulate, basally with longitudinal rugae; metasomal T1 polished and shiny, remaining terga reticulate.

Male. Unknown.

Leioproctus* (*Euryglossidia*) *heterodoxus
(Cockerell, 1916)

Fig. 31

Notocolletes heterodoxus Cockerell, 1916: 45.

Leioproctus (*Notocolletes*) *heterodoxus* (Cockerell)—Michener, 1965: 68.

Leioproctus (*Euryglossidia*) *heterodoxus* (Cockerell)—Michener, 2007: 152.

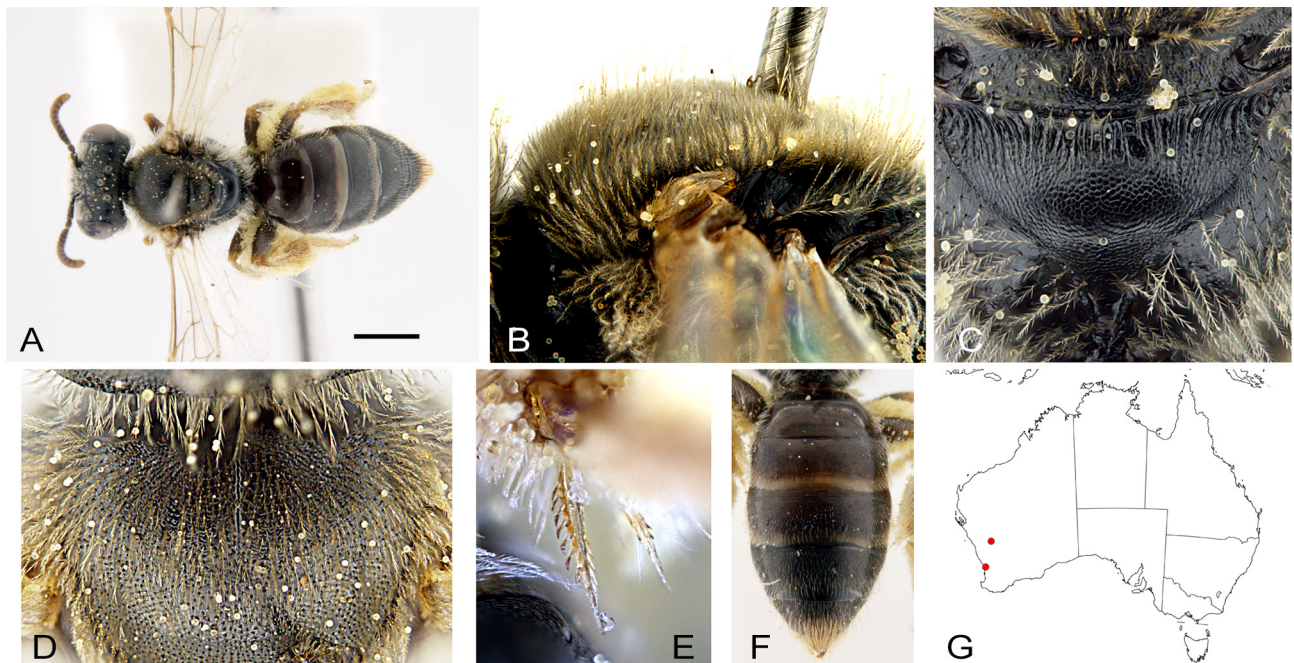


Figure 30. *Leioproctus* (*Euryglossidia*) *halictiformis* (Smith). ♀: A, dorsal view; B, scutum lateral view; C, propodeal triangle; D, scutum dorsal view; E, inner hind tibial spur ventral view; F, metasoma; G, collection locations. Scale bar: 1 mm.

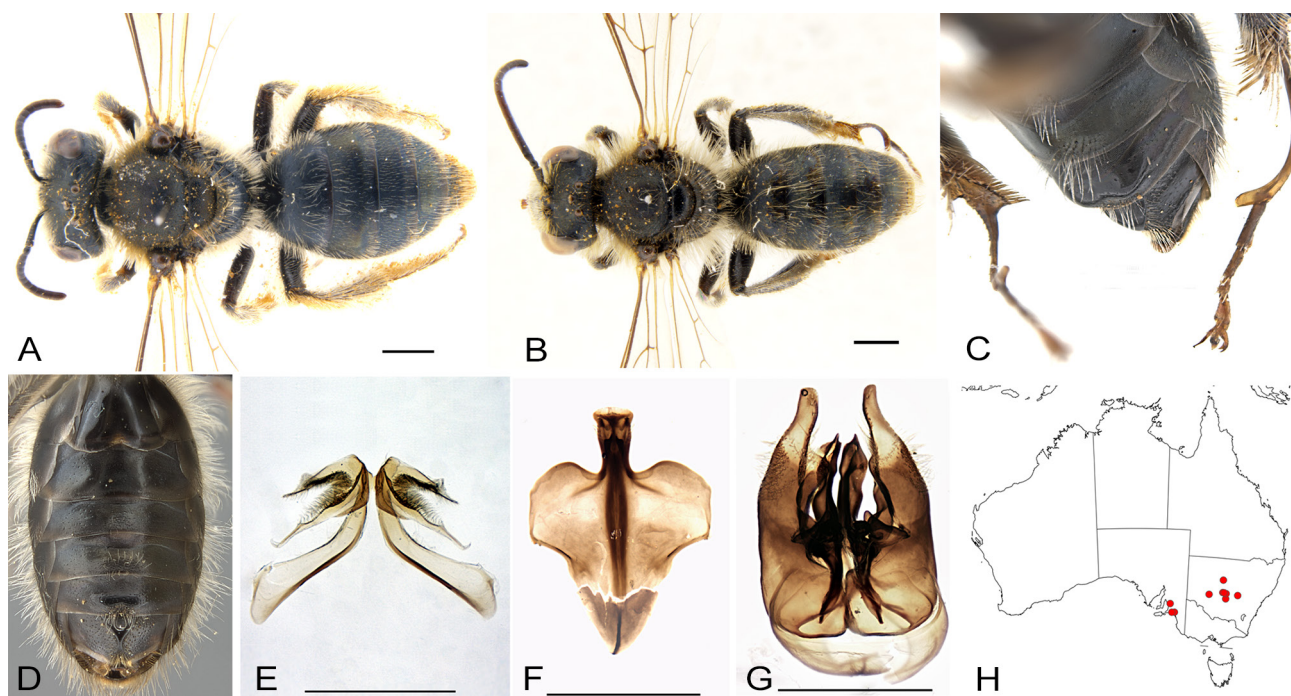


Figure 31. *Leioproctus (Euryglossidia) heterodoxus* (Cockerell): A, ♀ dorsal view; B, ♂ dorsal view; C, ♂ hind tarsi; D, ♂ metasomal sterna; E–G, ♂ terminalia ventral views; H, collection locations. Scale bars: 1 mm.

Holotype. ♂, Gawler District, SA (as Gawter D.S. Austr.), BMNH Hym.17.a.399—examined using NKM Portal images.

Other specimens examined: 2♀, 50 km W Mossgeil, NSW (33.3°S 144.1°E), 16 Sep 1980, N.W. Rodd, AMS K.593229, 30; ♀, 5 km W Euabalong West (33.0328°S 146.3461°E), 7 Oct 2006, M. Batley, on *Calotis*, AMS K. 361195; 3♂ ♀, 23 km W Parkes, NSW (33.1067°S 147.9387°E), 2 Sep 2007, M. Batley, on white daisy, AMS K.359901, 02, 38, 39; ♀, 33 km W Euabalong West, NSW (32.9500°S 146.0614°E), 3 Sep 2007, M. Batley, on *Cyphanthera albicans*, AMS K.359942; 2♂, 22 km S Mount Hope, NSW (32.9411°S 145.8786°E), 3 Sep 2007, M. Batley, on *Calotis*, AMS K.359943, 44; ♀, 3 km SW Cobar, NSW (31.5080°S 145.8022°E), 1 Sep 2013, M. Batley, on *Harmsiodoxa brevipes*, AMS K.447311.

Diagnosis. Moderately large, body length 9–10 mm, integument dull, black with weak green iridescence on parts of mesosoma and metasoma, head and thorax with open long hair, female hind basitibial plate with golden setae, male with strongly modified mid and hind basitarsi.

Description. The female has been described and the male terminalia figured by Houston, 1974.

Leioproctus (Euryglossidia) imitator (Rayment, 1959)

Fig. 32

Lysicolletes imitator Rayment, 1959: 327.

Leioproctus (Euryglossidia) imitator—Michener, 1965: 69.

Holotype. Location of male holotype unknown, but the original description includes a drawing of the distinctive male terminalia of this species and one of the male specimens

examined was collected within 3 km of the type locality.

Other specimens examined: 5♀ 12♂, Turrumurra, NSW (33.686°S 151.160°E), 23 Jul 2003, 30 Jul & 7 Aug 2004, 30 Jul 2006, M. Batley, on *Boronia ledifolia* & *Eriostemon australasius*, AMS K.361097–8, K.361109–17, K.291227–30, K.359846–7; 4♂ Heathcote NP, NSW (34.152°S 150.968°E), 31 Jul & 10 Aug 2001, M. Batley, on *Epacris microphylla* & *Leucopogon microphyllus*, AMS K.593196, K.593238, 39, 41; ♀ Marramarra NP, NSW (33.569°S 151.109°E), M. Batley, on *Eriostemon australasius*, AMS K.593240.

Diagnosis. Small, head and mesosoma black, metasoma dorsally dark brown, paler ventrally, frons areolate, scutum closely (male) or openly (female) punctate with reticulate interspaces, propodeal triangle without rugae, basally reticulation stretched horizontally in female.

Redescription of male. Body length 4.7 mm. Relative head dimensions: HW 100; HL 82; UFW 70; LFW 54; CL 30; FL 120; SL 31.

Clypeus convex and supraclypeal area elevated; scape not reaching median ocellus; frontal carina reaching half way from apex of supraclypeal area towards median ocellus; ocellular area slightly depressed; gena about as wide as eye; metanotum without a tubercle, about 1/3 the length of the horizontal part of propodeum; claws cleft with inner tooth slightly smaller than outer tooth.

Colouration. Head and mesosoma black, except flagellum, and mandible apically, brown, metasoma dorsally brown, becoming darker apically, ventrally yellow-brown, legs predominantly brown with anterior faces of fore and mid tibiae and tarsi yellow-brown.

Sculpture. Lower face shiny, reticulate with close punctures, i=1–3d; frons areolate with a suggestion of striae near the ocelli; scutum and scutellum reticulate dull with

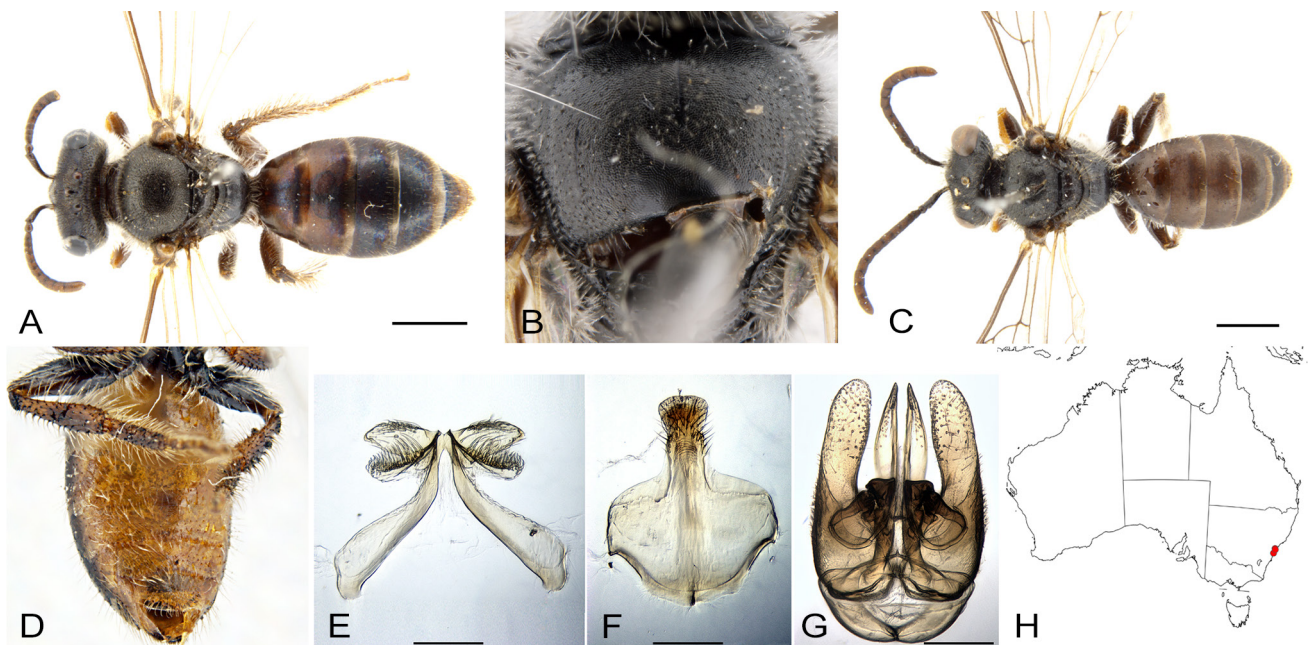


Figure 32. *Leioproctus* (*Euryglossidia*) *imitator* sp. nov.: A, ♀ dorsal view; B, ♀ scutum; C, ♂ dorsal view; D, ♂ metasoma ventral view; E–G, ♂ terminalia ventral views; H, collection locations. Scale bars: A, C, 1 mm; E–G, 200 µm.

close, fine punctures, $i=0.5-1d$; area of propodeum strongly reticulate; metasomal terga with fine lineo-reticulation, apical margins smoother.

Pubescence. Long, white, plumose hair, open on clypeus and paraclypeal areas and close on gena, frons with shorter, fine simple brown hair, longer on vertex; scutum with open, fine erect simple brown hair; mesosoma laterally and ventrally with open long, white plumose hair; metasomal sterna with weak rows of white, almost simple hair, most noticeable on S4–S6.

Description of female. Body length 5.8 mm. Relative head dimensions: HW 100; HL 84; UFW 72; LFW 59; SL 36; FL 70; CL 29.

Clypeus convex and supraclypeal area elevated; scape not reaching median ocellus; frontal carina reaching half way from apex of supraclypeal area towards median ocellus; ocellular area not depressed; gena about as wide as eye; metanotum without a tubercle, about $\frac{1}{3}$ the length of the horizontal part of propodeum; claws with subapical inner tooth; inner hind tibial spur pectinate with three slender teeth about twice as long as basal width of spur; metasomal terga convex, T2 laterally with large, almost circular fovea.

Colouration. Black, except frons, scutum and metasomal terga with faint bronze sheen, stronger on tergal margins; mandible dark red apically, preceded by small amber portion; flagellum apically dark brown; tegulae translucent brown; metasomal sterna S1–S3 mottled orange-brown and black; tarsi and anterior face of fore tibia brown.

Sculpture. As for male except scutum openly punctate, $i=1-2d$; scutellum sparsely punctate medially.

Pubescence. As for male except: scutal hair short, finely-branched interspersed with sparse, longer, simple dark hairs; hind tibial scopa open, white, mostly pectinate but bipectinate on anterior margin and weakly branched on the posterior margin, very pale brown on anterior margin but dark brown near basitibial plate; metasomal sterna

S2–S4 with rows of white, weakly-branched hair, S5 with moderately long fringe of dense, pale golden-brown hair; S6 with patch of similar hair.

Variation. Some females have metasoma all or partly black.

Remark. The pale metasomal sterna of males is not common in *Euryglossidia* and provides further confidence that the species can be correctly identified from the original description. The small differences between Rayment's description and the specimens examined can be ascribed to subjective terminology and/or intraspecific variation. The differences are: the body lengths of other specimens are all less than that reported for the type specimen; the supraclypeal area of males has close punctures, which may have been obscured by reticulation in the type; frontal carina extends only $\frac{1}{2}$ or $\frac{2}{3}$ of distance to the median ocellus; lineation on the scutum not particularly "delicate" and tegulae are brown not black.

Etymology. The specific epithet is a Latin adjective referring to the relatively pale metasomal sterna of the male.

Leioproctus (*Euryglossidia*)

impolitus sp. nov.

urn:lsid:zoobank.org:act:F24CD379-FB2A-458D-9176-1C826383B160

Fig. 33

Holotype. ♂ Orange Grove, WA (32.023°S 116.025°E), 10 Oct 1986, R. Peakall, on *Prasophyllum fimbria*, WAM 20772.

Paratypes. 13♀, Gooseberry Hill, WA (31.94°S 116.05°E), 9 Oct 1986, T.F. Houston, on *Petrophile striata*, WAM 10962–74.

Diagnosis. Small, integument black, mostly dull, frons areolate, propodeal triangle with basal rugae, male clypeus with sparse, short, adpressed setae, frons medially prominent with small polished area behind scape.

Description of male. Body length 4.8 mm. Relative head measurements: HW 100; HL 82; UFW 68; LFW 52; CL 33; FL 200; SL 28.

Inner orbits strongly convergent ventrally; mandible bidentate, smoothly curved; clypeus transversely convex; anterior face of supraclypeal area flat; flagellum subgeniculate, long, segments fl2–fl11 longer than wide; gena, viewed laterally, not as wide as compound eye; tarsi slender; claws cleft.

Colouration. Head and mesosoma black, except flagellum dark brown dorsally, paler ventrally, legs dark brown, paler at either end of fore and mid tibiae, tegula transparent dark brown; metasoma dark brown.

Pubescence. Clypeus with sparse, flattened, colourless setae, $1\times\text{MOD}$; lower paraocular areas with similar setae, but shorter and closer; lower frons and scapes with erect, plumose, pale brown hair, $1\times\text{MOD}$; scutum with a mixture of

sparse pale brown, plumose hair, $1\times\text{MOD}$, and dark brown, weakly branched hair, $2\times\text{MOD}$; scutellum along lateral margins, with rows of mid-brown, erect, weakly-branched hair, $2\times\text{MOD}$; metasomal hair sparse.

Sculpture. Head strongly and very finely reticulate except in paraocular areas and depressions behind scapes; clypeus and supraclypeal area with very small punctures, $i=4-5d$; frons coarsely areolate with a few short rugae converging on median ocellus; similar strong reticulation on the scutum and scutellum obscures sparse weak punctures; propodeal triangle also finely and strongly reticulate with several longitudinal rugae basally; metasoma strongly lineo-reticulate, apical margins of terga shiny.

Description of female. Body length 5.0 mm. Relative head measurements: HW 100; HL 76; UFW 70; LFW 57; CL 30; FL 68; SL 32.

Inner orbits converging ventrally; clypeus strongly convex; mandible bidentate, smoothly curved; frons medially prominent, bigibbous, upper half sub-horizontal in front of median ocellus; frontal carina extending half way to median ocellus, replaced by narrow sulcus; flagellum short, segments

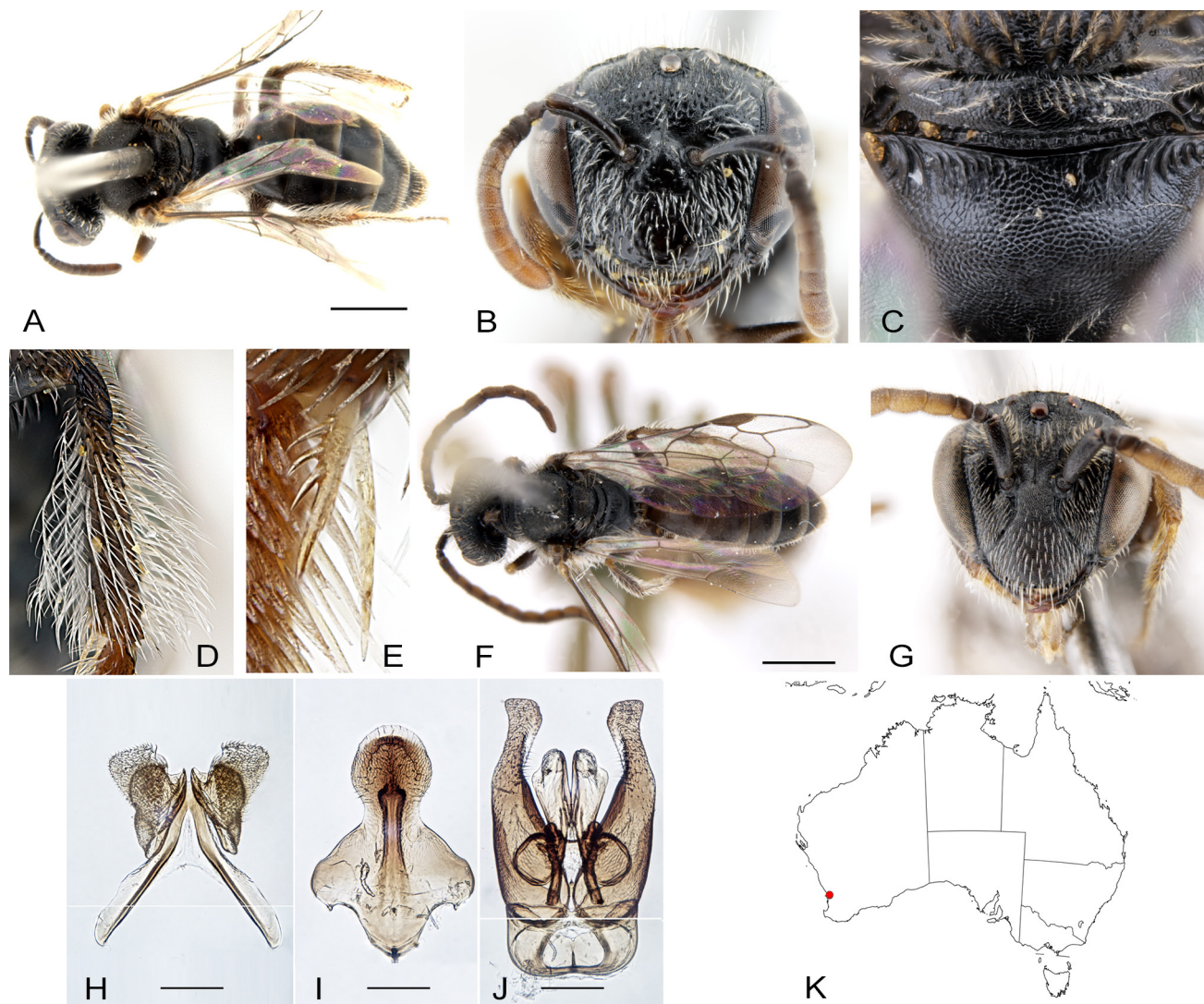


Figure 33. *Leioproctus (Euryglossidia) impolitus* sp. nov.: A, ♀ dorsal view; B, ♀ face; C, ♀ propodeal triangle; D, ♀ hind tibial scopa; E, ♀ inner hind tibial spur; F, ♂ dorsal view; G, ♂ face; H–J, ♂ terminalia ventral views; K, collection locations. Scale bars: A, F, 1 mm; H–J, 200 μm .

fl1–fl9 shorter than wide; width of gena a little less than width of compound eye viewed laterally; inner hind tibial spur with 3–4 teeth as long as width of shaft; claws with sharp medial inner tooth.

Colouration. Black except flagellum dark brown dorsally, mostly yellow-brown ventrally, tegulae transparent brown, legs dark brown with anterior faces of fore tibia and basitarsus yellow-brown, mandible black with dark red tip; metasomal terga with apical margins translucent, prepygidial fimbria dark brown.

Pubescence. Hair on clypeus sparse, mostly simple, transparent, $1\times\text{MOD}$; in paraocular areas and on gena open, white, finely branched $1\times\text{MOD}$; hair on mesepisternum sparse, white, plumose, $2\times\text{MOD}$; hair of hind tibial scopa open to sparse, white, openly bipectinate on anterior margin, openly pectinate on posterior half; metasomal terga with sparse hair except for dark brown prepygidial fimbria; metasomal sterna S2–S5 with open bands of white, weakly branched white hair on posterior half, $2\times\text{MOD}$, S5 with a dense, white apical fringe.

Sculpture. Clypeus with strong mid-sized punctures with polished interspaces, $i=0.2-1.0d$, including occasional contiguous groups; anterior face of supraclypeal area weakly reticulate, almost impunctate; frons areolate, area typically associated with facial fovea in ocellular region conspicuously shiny (Fig. 33B); punctures of scutum and scutellum small, $i=d$, with strongly reticulate interspaces; propodeal triangle more coarsely reticulate with short longitudinal rugae basally, peripheral suture indistinct; metasomal terga with fine, satin lineo-reticulation, almost impunctate integument.

Etymology. The specific epithet is a Latin adjective meaning rough, referring to the fine sculpture of many areas, particularly the scutum and scutellum.

Leioproctus (*Euryglossidia*)

korungensis sp. nov.

urn:lsid:zoobank.org:act:3EA03DED-E37E-4D57-9CA7-E7A5E0CA7A41

Fig. 34

Holotype. ♂ Helena Valley, WA (31.939°S 116.067°E), 4 Aug 1987, R. Peakall, on *Hakea lissocarpha*, WAM 10695.

Paratypes. 2♀, Crystal Brook, Lesmurdie, WA (32.013°S 116.033°E), Aug 1986, R. Peakall, WAM 10693, 94.

The sexes were associated by morphological similarity. Although collected 12 months apart, collection sites were separated by less than 9 km with suitable habitat between them. Shared features were leg colour, frons sculpture and length of sulci bordering the propodeal triangle. The combination makes it unlikely that they are separate species.

Diagnosis. Large, weakly iridescent, tibiae and tarsi orange-brown, male with depressed ocellular area, female mesosoma laterally weakly iridescent blue, male distinguished from *criniventris* by sparse hair on S2–S4, absence of expanded mid basitarsus and colour of clypeal hair, female distinguished from *cristativentris* and *criniventris* by weak peripheral suture of propodeal triangle.

Description of male. Body length 9.5 mm. Relative head measurements: HW 100; HL 73; UFW 68; LFW 54; CL 24; FL 172; SL 26.

Vertex elevated well above top of eyes; ocellular and upper paraocular areas strongly depressed; inner orbits converging ventrally; clypeus and supraclypeal area gently convex; frontal carina extends $\frac{2}{3}$ of way to median ocellus, changing to polished triangular sulcus; mandible bidentate; flagellum long, segments fl3–fl10 twice as long as wide; mid basitarsus not expanded; hind tarsus longer than hind tibia,

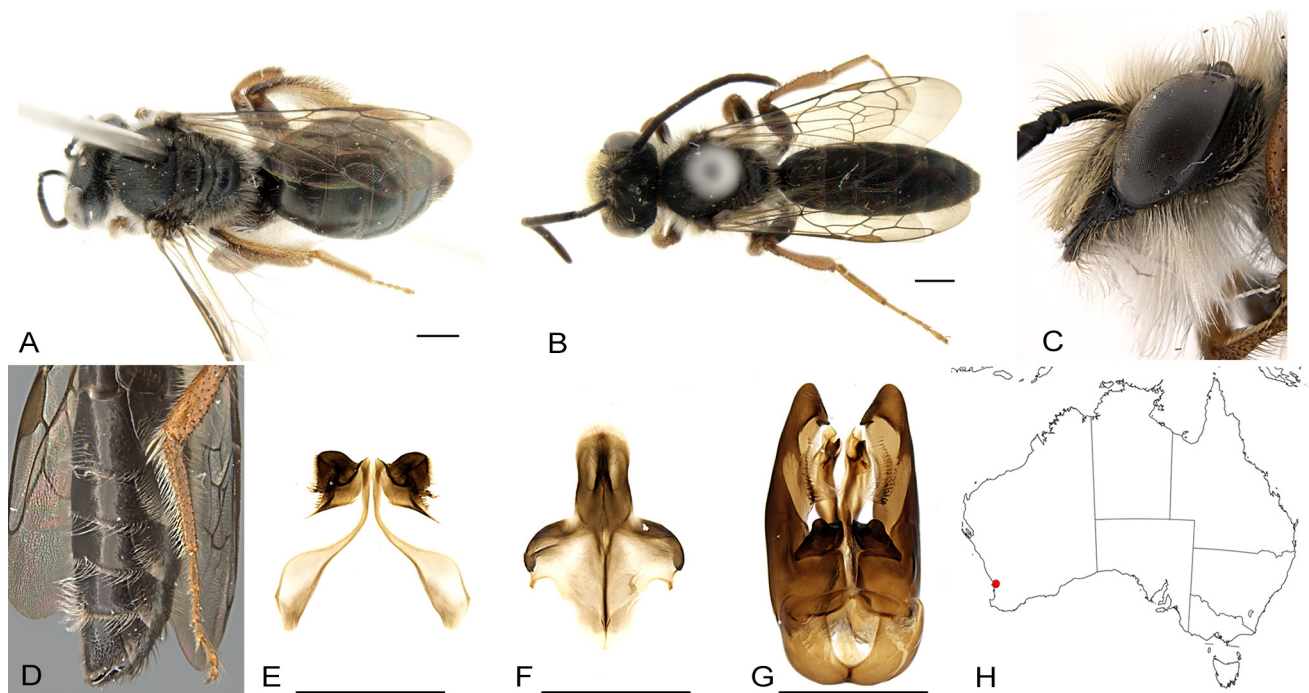


Figure 34. *Leioproctus* (*Euryglossidia*) *korungensis* sp. nov.: A, ♀ dorsal view; B, ♂ dorsal view; C, ♂ head lateral view; D, ♂ metasomal sterna; E–G, ♂ terminalia ventral views; H, collection locations. Scale bars: 1 mm.

with relative length of tarsal segments 100:37:27:17:25; claws cleft.

Colouration. Black with slight brassy sheen, except clypeus and supraclypeal area black, flagellum, coxae, trochanters and most of femora dark brown, tibiae and tarsi orange-brown with a few darker suffusions; wings with slight brownish tint.

Pubescence. Hair of clypeus and lower paraocular areas adpressed, dense, pale gold, $2\times\text{MOD}$; gena with ventral beard of white, plumose hair, $5\text{--}6\times\text{MOD}$; hair on scutum open, golden-brown, openly branched, $2\times\text{MOD}$, interspersed with dark simple setae; on scutellum dark brown; on sides of mesosoma open, white, plumose, $ca\ 3\times\text{MOD}$; metasoma with sparse, mostly simple hair dorsally, S2–S5 with sparse apical rows of erect of erect white hair, S5 medially with a patch of open, erect, white plumose hair.

Sculpture. Punctures on clypeus small, almost contiguous, with reticulate interspaces; front face of supraclypeal area rugoso-reticulate; frons dull, reticulate with fine, irregular vertical rugae; scutum and scutellum with strong reticulation obscuring small punctures; propodeal triangle reticulate and shiny with anterior half of peripheral suture indistinct, a short scrobiculate sulcus at anterior ends only; metasoma strongly lineo-reticulate.

Description of female. Body length 10.0 mm. Relative head measurements: HW 100; HL 72; UFW 66; LFW 65; CL 29; FL 80; SL 36.

Inner orbits parallel; clypeus convex; anterior face of supraclypeal area flat, triangular at an angle to clypeus; frontal carina extends half way to median ocellus, replaced above by wide, triangular, polished sulcus; mandible bidentate, smoothly curved; length of flagellum moderate, segments fl3–fl10 longer than wide; width of mid basitarsus less than $0.37\times\text{length}$; inner hind tibial spur with 5 well-separated teeth, basal teeth twice as long as width of spur; claws with a large medial tooth.

Colouration. Clypeus and supraclypeal area black; upper head and mesosoma weakly iridescent blue except frons, scutum, scutellum, metanotum and propodeal triangle with brassy sheen; mandible brown with dark red tip; flagellum and tegulae dark brown; legs black proximally, tarsi, tibiae and distal ends of femora rich orange-brown; wings infuscate; metasoma black with faint brassy sheen on T1, T2 and stronger sheen on T3–T5; prepygidial fimbria dark brown.

Pubescence. Hair on clypeus open to sparse, white, weakly branched, $2\times\text{MOD}$; in paraocular areas, on lower frons and gena open, white, plumose, $1\text{--}2\times\text{MOD}$; hair on scutum open, pale brown, weakly branched, $ca\ 0.5\times\text{MOD}$, interspersed with longer, dark brown, simple setae; hair of mesepisternum open, white, plumose, $2\times\text{MOD}$; hair of hind tibial scopa white, bipectinate on anterior margin, mid-brown, pectinate elsewhere; metasoma dorsally with sparse hair, except for weak prepygidial fimbria of mostly simple hair; apical half of metasomal sterna S2–S4 with plumose white hair, $2\times\text{MOD}$; apical half S5 with almost simple pale brown hair and a dense apical fringe of similar hair, $2\times\text{MOD}$; apical half S6 with close pale brown, plumose hair.

Sculpture. Punctures on clypeus mid-sized to large, $i\approx d$, occasionally contiguous, with weakly reticulate interspaces; frons with small punctures obscured by fine, irregular, vertical rugae and strong reticulation; scutum strongly

reticulate with small, weak punctures, $i\approx d$; scutellum with strong reticulation obscuring punctures; propodeal triangle reticulate with short anterior ends of peripheral suture with a narrow, poorly defined scrobiculate sulcus.

Etymology. The specific epithet refers to Korung NP, where the females were collected.

Leioproctus (Euryglossidia)

latipes sp. nov.

urn:lsid:zoobank.org:act:D642D6FA-23A3-4490-A734-72305AB32A17

Fig. 35

Holotype. ♂ Mount Colah, NSW (33.676°S 151.135°E), 12 Aug 2004, M. Batley, on *Boronia ledifolia*, AMS K.361100.

Paratypes. 2♂ 1♀, Lane Cove, NSW (33.818°S 151.160°E), 10 Aug 1947, N.W. Rodd, AMS K.396087, 98, 99; 2♂, Cheltenham, NSW (33.751°S 151.085°E), 27 Aug 1950, N.W. Rodd, AMS K.396100; 1♂, Hornsby, NSW (33.690°S 151.073°E), 9 Aug 2004, M. Batley, on *Boronia ledifolia*, AMS K.361099; 1♀, Roseville Chase, NSW (33.764°S 151.199°E), 18 October 2002, M. Batley, on *Acacia parramattensis*, AMS K.396050.

Diagnosis. Small, head and mesosoma black, metasoma banded dark brown and orange (male) or red-brown with darker suffusions (female), male fore tarsus broad, clypeus with short, adpressed silver hair, female distinguished from *euscopatus* by orange-brown tibiae, orange tegula and short, close scutal tomentum.

Description of male. Body length: *ca* 5.5 mm. Relative measurements: HW 100; HL 73; UFW 68; LFW 47; CL 28; FL 180; SL 30.

Inner orbits ventrally convergent; mandible bidentate, smoothly curved; clypeus transversely strongly convex; flagellum relatively long, segments fl2–fl10 *ca* $1.5\times$ as long as wide; gena, viewed laterally, not as wide as compound eye; fore tarsal segments ta2–ta4 chordate, wider than long, inner surface closely setose; claws cleft.

Colouration. Head and mesosoma black, except tibiae orange-brown with darker infusions, tarsi orange-brown basally becoming dark brown apically, mandible brown, apex dark red, flagellum mid-brown, tegula transparent orange-brown; metasomal terga basally orange-brown, apically dark brown, except basal half of T1 dark brown or black, occasionally T1 and/or T5, T6 entirely dark; metasomal sterna yellow-brown, often infuscate.

Pubescence. Hair on clypeus and lower paraocular areas pale gold, open, tightly-branched, adpressed, $0.5\text{--}1\times\text{MOD}$, interspersed with dark, simple setae, $1\text{--}2\times\text{MOD}$; on frons and gena brown, fine, erect, openly plumose to simple, $\sim 1\times\text{MOD}$; on scutum and scutellum brown, erect, weakly-branched, $2\times\text{MOD}$; longer on scutellum; on mesosoma laterally white, plumose, $2\text{--}3\times\text{MOD}$; metasomal hair sparse apart from apical fringes, $1\text{--}1.5\times\text{MOD}$, on sterna S5, S6.

Sculpture. Head and mesosoma strongly reticulate, obscuring any punctures; metasoma shiny with weak reticulation and scattered, tiny, shallow punctures; suture around propodeal triangle weakly defined.

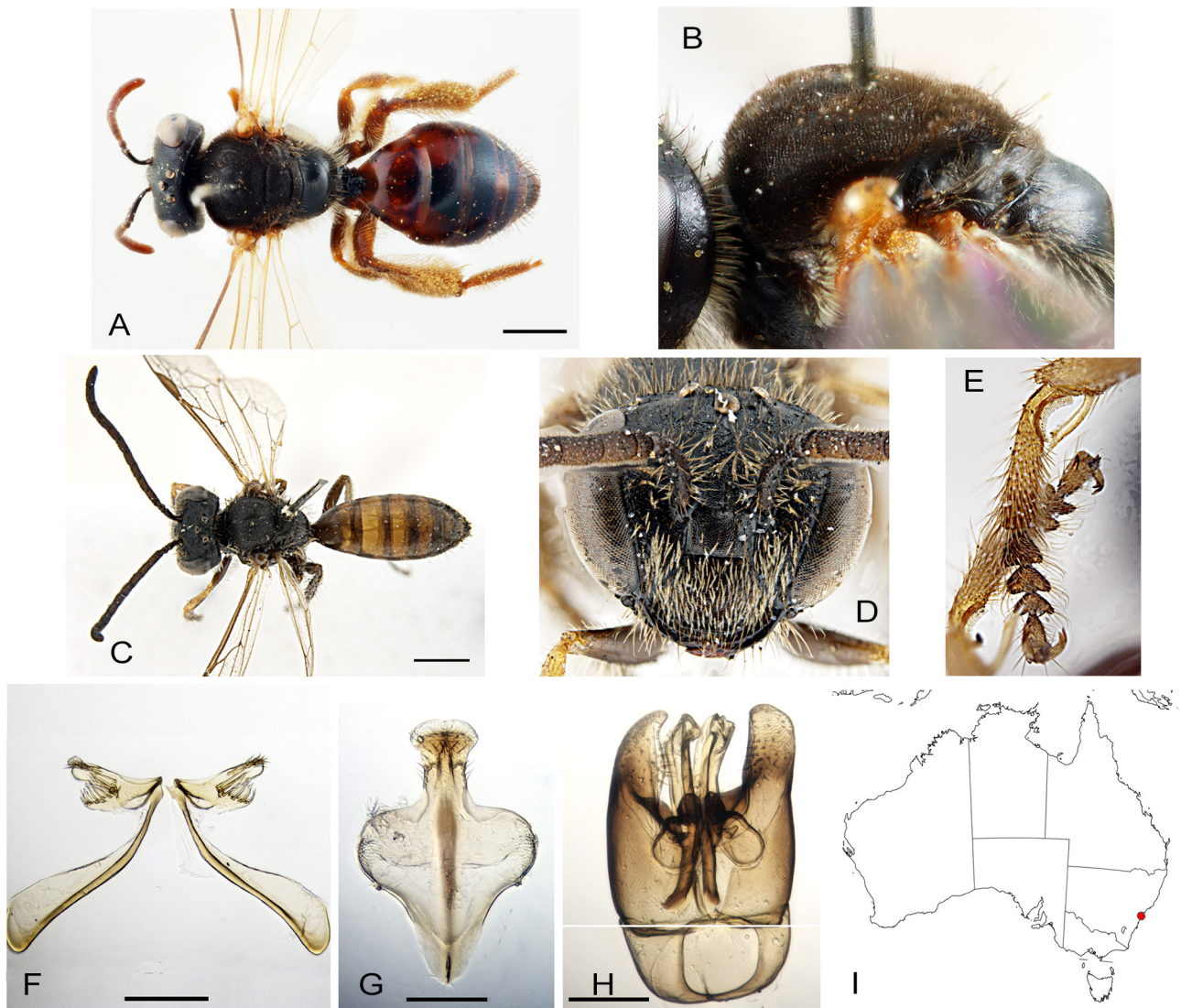


Figure 35. *Leioproctus* (*Euryglossidia*) *latipes* sp. nov.: A, ♀ dorsal view; B, ♀ scutal hair; C, ♂ dorsal view; D, ♂ face; E, ♂ fore tarsus; F–H, ♂ terminalia ventral view; I, collection locations. Scale bars: A, C, 1 mm; F–H 200 µm.

Description of female. Body length 6.7 mm. Relative head measurements: HW 100; HL 80; UFW 62; LFW 54; CL 24; FL 72; SL 44.

Clypeus transversely convex; mandible bidentate, smoothly curved; flagellum short, segments fl1–fl9 shorter than wide; inner hind tibial spur with 4–6 teeth as long as width of spur; claws with small, subapical inner tooth.

Colouration. Head and mesosoma black except mandible largely amber with dark red tip, flagellum dark brown dorsally, orange-brown ventrally, tegula amber, fore and mid tibiae, all tarsi orange-brown, wings tinted yellow; metasoma red-brown with irregular dark suffusions, T2 laterally with small, oval black marks.

Pubescence. Facial hair sparse, on lower paraocular areas golden, weakly branched, interspersed with longer simple setae; around antennal sockets white, closely branched, 1×MOD; upper frons with fine, mostly simple setae; hair on gena open, white, closely branched, 1–2×MOD; on scutum and scutellum erect, tightly branched, pale brown, very short, ~0.2×MOD; on sides of mesosoma sparse, white, plumose, ~3×MOD; hair of hind tibial scopa close, brown except white on anterior edge and a few simple stiff setae near the

basitibial plate; hair on metasomal terga sparse apart from brown prepygidial fimbria; metasomal sterna S2–S4 with white, plumose, erect hair, 2–3×MOD on apical half to 1/3; S5, S6 with dense golden-brown apical fringes.

Sculpture. Lower face shiny, frons strongly reticulate; punctures of clypeus strong, medium with polished interspaces, i=1–2d; supraclypeal area weakly reticulate, sparsely punctate medially, more closely on lateral faces; punctures of lower paraocular areas weak, small with reticulate interspaces, i=d; of frons small and weak with strongly reticulate interspaces, i≈2d; scutum and scutellum with strong reticulation obscuring punctures; propodeal triangle more coarsely reticulate, peripheral suture weak; metasomal terga with a few scattered setiferous punctures becoming denser towards fimbria.

Etymology. The specific epithet is a Latin noun formed from the words for broad and foot referring to the four distal segments of the fore tarsus.

*Leioproctus (Euryglossidia)**macalpinei* sp. nov.

urn:lsid:zoobank.org:act:BD02CA8D-9FCA-4021-896A-4114A2E450D0

Fig. 36

Holotype. ♂ 4 km NE Doyles Creek, NSW (32.513°S 150.809°E), 19 Aug 2005, M. Batley, on *Acacia buxifolia*, AMS K.361127.

Paratypes. 5♂ 1♀, same collection data as holotype, AMS K.361126, K.224620–4.

Other specimens examined: 6♂, same collection data as holotype, AMS K.224616,17, 25–28; 4♂, 4 km NE Doyles Creek, NSW (32.513°S 150.809°E), 22 Aug 2005, M. Batley, on *Acacia buxifolia* AMS K.224640–43; 1♀, Warrumbungles NP, NSW (31.29°S 149.00°E), 26 Sep 1976, G. Daniels, AMS K.396327; ♂ Doyles Creek, NSW (32.51°S 150.82°E), 28 Aug 1996, D.K. McAlpine, AMS K.396328; 2♀ 2♂, 2 km SSE Jerrys Plains, NSW (32.499°S 150.891°E), 19 Aug 2005, 16 Aug 2006, M. Batley, on *Acacia buxifolia*, AMS K.359851–2, K.224636–37; 6♂, ♀ Dubbo, NSW (32.2°S 148.6°E), 24 Aug 1925, W.W. Froggatt, on *Acacia*, ANIC.

Diagnosis. Moderate size, integument black, weakly iridescent, wings brownish, legs dark brown, male upper paraocular and ocelocular areas very weakly depressed, length flagellum slightly less than 2×HW, sternal hair sparse, female inner hind tibial spur with 3–4 stout, curved teeth, clypeal punctures large, dense, $i < d$.

Description of male. Body length: *ca* 7.5 mm. Relative measurements: HW 100; HL 80; UFW 64; LFW 52; CL 28; FL 185; SL 27.

Inner orbits converge ventrally; mandible bidentate, smoothly curved; clypeus and supraclypeal area gently convex; subantennal suture 1.3× as long as width of antennal socket; frontal carina strong, extending *ca* half way to median ocellus; flagellum long, length of segments fl3–10, $>1.5 \times$ width.

Colouration. Upper face, scutum, mesepisternum and propodeal triangle weakly brassy; metasoma black with greenish sheen; legs dark brown; flagellum dark brown dorsally, paler ventrally.

Pubescence. Hair on clypeus and lower paraocular area semi adpressed, pale gold, mostly simple, 2–3×MOD; on upper paraocular and interantennal areas erect, white, plumose, 2–3×MOD; on frons sparse and fine; on gena close, white, $\leq 4 \times$ MOD, forming a beard; on scutum and scutellum erect, brown, mostly simple, 2–3×MOD; on sides of mesosoma white, plumose, 4×MOD; metasomal hair sparse except S4, S5 apically with rows of open, white hair.

Sculpture. Clypeal punctures strong, medium to large, $i < d$, with strongly reticulate interspaces; supraclypeal area medially impunctate, reticulate but moderately shiny; punctures in paraocular areas medium, $i < d$; frons with small, weak punctures, $i \approx d$, mostly obscured by reticulation; punctures of scutum and scutellum mid-sized, $i \approx d$; propodeal triangle with rugae baso-laterally, curving to meet to peripheral suture perpendicularly.

Description of female. ♀ Body length *ca* 8 mm. Relative measurements: HW 100; HL 80; UFW 65; LFW 62; CL 30; FL 74; SL 34.

Inner orbits parallel; mandible bidentate, smoothly curved; clypeus convex; subantennal suture 1.3× as long as width of antennal socket; supraclypeal area prominent, with dorsolateral and anterior surfaces of roughly equal area;

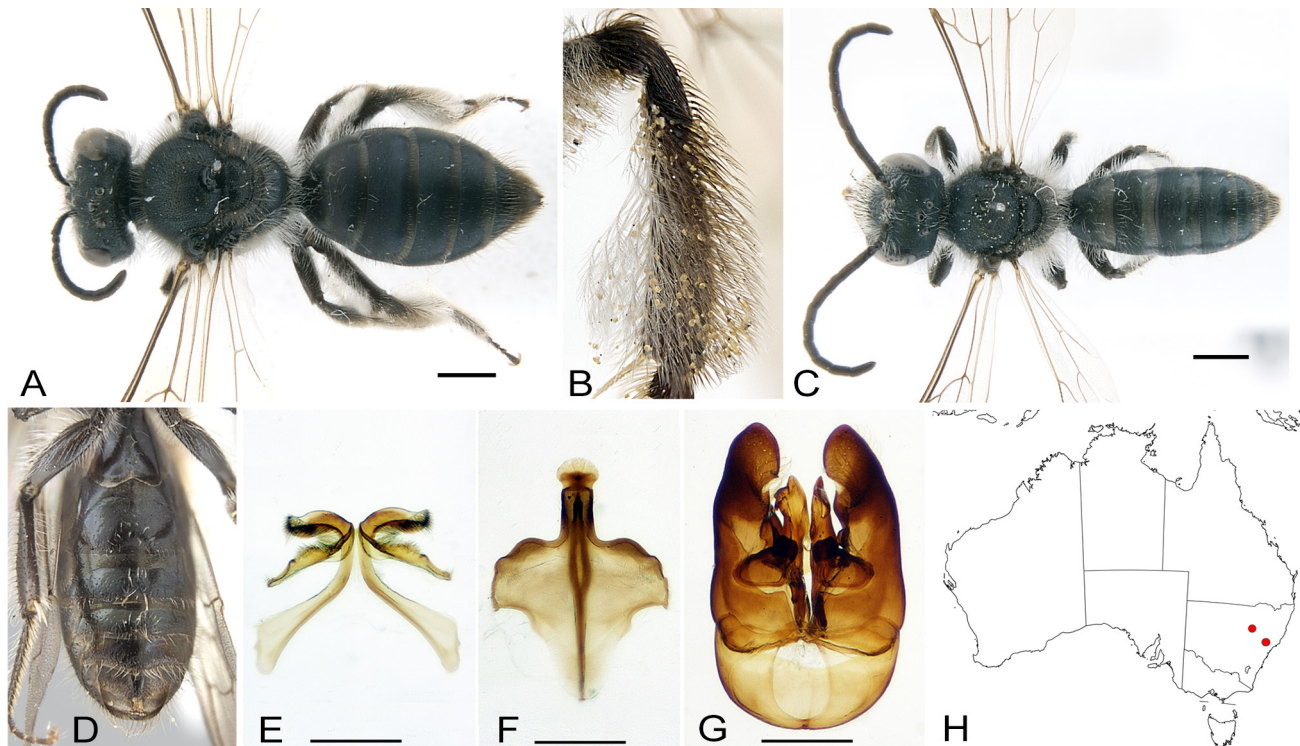


Figure 36. *Leioproctus (Euryglossidia) macalpinei* sp. nov.: A, ♀ dorsal view; B, ♀ hind tibial scopa; C, ♂ dorsal view; D, ♂ metasomal sterna; E–G, ♂ terminalia ventral views; H, collection locations. Scale bars: A, C, 1 mm, E–G, 500 μ m.

frontal carina strong, reaching about half way to median ocellus; flagellum moderately long, segments fl2–fl7 *ca* as long as wide; gena more than half as wide as compound eye viewed laterally; inner hind tibial spur with 3–4 stout, curved teeth almost twice as long as width of spur; claws with a sharp subapical tooth.

Colouration. Upper face, scutum (except medially), mesepisternum and propodeal triangle weakly brassy; metasoma black with bronze sheen, except tergal margins brown; legs dark brown; flagellum dark brown dorsally, paler ventrally.

Pubescence. Clypeal hair open, golden-brown, weakly-branched, 2×MOD, interspersed with simple setae; hair on paraocular and interantennal areas, white, plumose, 2×MOD; on frons fine, dark brown, 1×MOD; on mesosoma laterally white, plumose, *ca* 3×MOD; hair of hind tibial scopa close, white, bipectinate on anterior margin, mid-brown, pectinate on posterior margin with simple setae near the basitibial plate; metasomal hair sparse except brown prepygidial fimbria, apical 1/3 of metasomal sterna S2–S5 with close, erect, plumose, white hair, 2–3×MOD, S5, S6 with dense, plumose apical fringes, *ca* 1.5×MOD.

Sculpture. Clypeal punctures strong, medium to large, *i*<*d*, with strongly reticulate interspaces; supraclypeal area medially impunctate, reticulate but moderately shiny; punctures in paraocular areas medium, *i*<*d*; frons with small, weak punctures, *i*≈*d*, mostly obscured by reticulation; punctures of scutum and scutellum mid-sized, *i*≈*d*; propodeal triangle with rugae baso-laterally, curving to meet to peripheral suture perpendicularly.

Etymology. The specific epithet is a Latin noun in the genitive case honouring Dr D.K. McAlpine who collected the first specimen at Doyles Creek and who provided the author with advice and encouragement.

Leioproctus (*Euryglossidia*)

macropunctatus sp. nov.

urn:lsid:zoobank.org:act:03FFA64C-C236-4C85-83A3-4E5C94C49B40

Fig. 37

Holotype. ♀ Yanchep, WA (31.500°S 115.685°E), 5 Sep 1962, A.M. Douglas, on *Hakea*, WAM 10782.

Paratypes. 14♀, same collection data as holotype, WAM 10776–81, 83–90.

Diagnosis. Small, black, frons with strong, irregular rugae, scutum strongly reticulate, clypeal punctures large, irregularly distributed with reticulate interspaces, scutal hair open, mid to dark brown.

Description of female. Body length 6.4 mm. Relative head measurements: HW 100; HL 89; UFW 74; LFW 69; CL 30; FL 82; SL 39.

Inner orbits parallel; clypeus gently convex transversely, longitudinally strongly convex near ventral margin; supraclypeal area prominent; mandible bidentate, smoothly curved; frontal carina extends more than half way to median ocellus; flagellum moderately short, segments fl2–fl7 shorter than wide; gena not quite as wide as compound eye viewed laterally; inner hind tibial spur with 4 strong oblique teeth about as long as width of spur; claws with small subapical tooth.

Colouration. Head and mesosoma black except flagellum ventrally and tegula dark brown; metasoma dark brown; wings brownish.

Pubescence. Hair of clypeus, paraocular areas, lower frons and gena open, white, plumose 1–2×MOD, interspersed on clypeus with simple setae; hair of scutum open, mid brown,

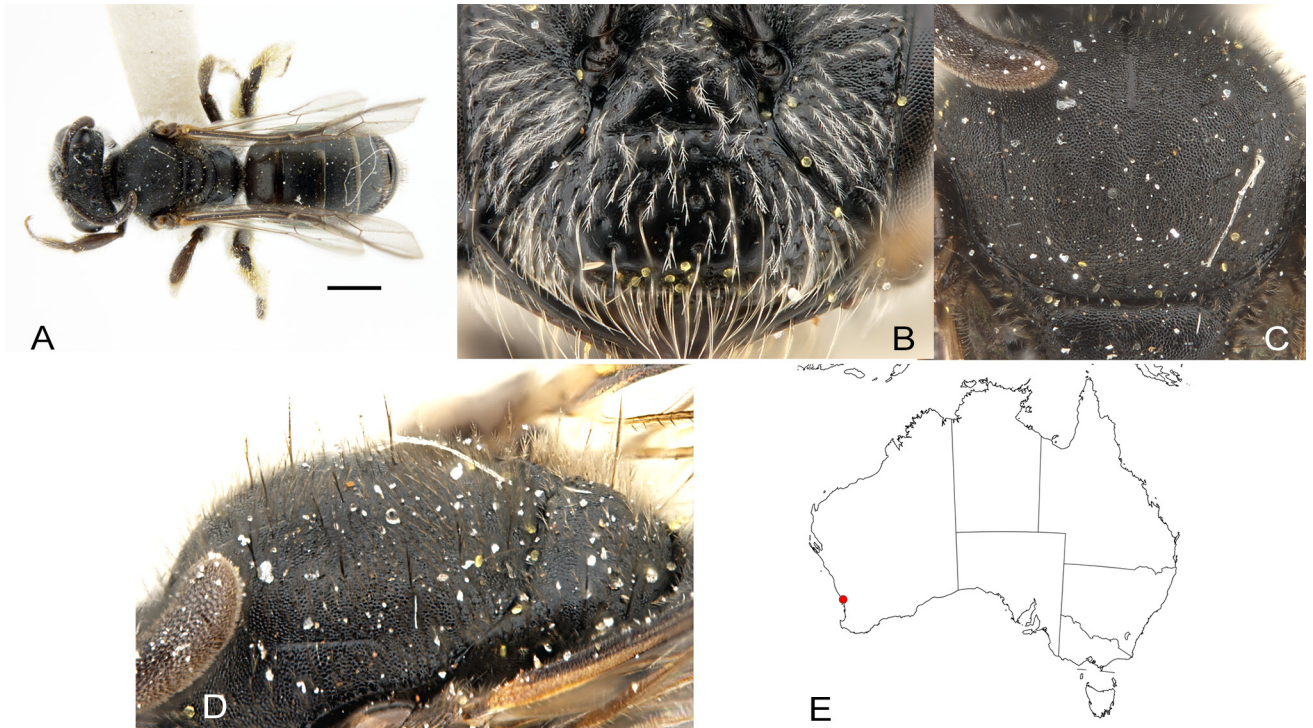


Figure 37. *Leioproctus* (*Euryglossidia*) *macropunctatus* sp. nov. ♀: A, dorsal view, scale bar 1 mm; B, clypeus; C, scutum; D, scutal hair; E, collection location. Scale bar: 1 mm.

plumose, $ca\ 0.5\times MOD$, interspersed with longer, dark simple setae; hair of mesepisternum open, white, plumose, $2\times MOD$; hair of hind tibial scopa open, white, bipectinate on anterior margin, brown, pectinate weakly branched on posterior margin; metasomal hair sparse dorsally apart from open, dark brown, weakly branched prepygidial fimbria, ventrally apical $\frac{1}{3}$ of metasomal sterna S3–S5 with open, white, weakly branched pectinate hair, $2\times MOD$; S5 with dense apical fringe $2\times MOD$, S6 with similar hair apico-medially.

Sculpture. Punctures on clypeus large, variable in size, $i=0.2-1d$, with reticulate interspaces; supraclypeal area and lower paraocular areas similar but including some small punctures; frons with strong irregular vertical rugae obscuring punctures and reticulation; scutum and scutellum strongly reticulate with small, shallow punctures, $i=2d$; propodeal triangle more coarsely reticulate, broad anterolateral sulci indistinctly indicated; punctures on metasomal terga small and sparse.

Male. Unknown.

Etymology. The specific epithet is a Latin adjective referring to the coarse sculpture of the clypeus.

Leioproctus (Euryglossidia) mastersi (Cockerell, 1929)

Fig. 38

Euryglossidia mastersi Cockerell, 1929: 215.

Leioproctus (Euryglossidia) mastersi—Michener, 1965: 69.

Holotype. ♀ K.G. Sound, WA, AMS K.48327.

Other specimens examined: 4♀, Badgingarra, WA (30.365°S 115.481°E), 4 & 10 Oct 2005, L. Packer, YUC.

Diagnosis. Medium sized, head and mesosoma black, metasoma red-brown with variable dark suffusions, frons coarsely rugose, clypeus and supraclypeal area prominent, polished, clypeus with large irregularly spaced punctures, frequently coalescent, apex of supraclypeal area broad.

Redescription of female. Body length 9.3 mm; head width 2.5 mm. Relative head dimensions: HW 100; HL 80; UFW 70; LFW 65; FL 66; SL 35; CL 27.

Clypeus and supraclypeal area protuberant, medial line carinate halfway to medial ocellus becoming a deep triangular sulcus below median ocellus; inner hind tibial spur with 9–11 teeth slightly shorter than width of spur; claws simple and stout.

Colouration. Head and mesosoma black except mandible with apex dark red and a short amber region pre-apically, flagellum, legs and tegulae dark brown; metasoma red-brown with variable dark areas, T2 laterally with a large black oval mark.

Pubescence. Clypeus with sparse, colourless simple setae, lower frons with open white, closely-branched hair, $1.5\times MOD$; scutum with open, mostly simple pale hair $ca\ 0.3\times MOD$, interspersed with dark brown unbranched setae, $1\times MOD$; sides of mesosoma with open to sparse, white, plumose hair, $2-3\times MOD$; hair on anterior half of hind femoral scopa open, white, pectinate with long branches, on posterior half translucent brown, pectinate to simple; prepygidial fimbria brown; apical half of metasomal sterna S2 & S3 with sparse, erect, weakly branched, pale brown hair, $1\times MOD$.

Sculpture. Clypeal punctures medium to large with polished interspaces, mostly unevenly distributed, $i=1-4d$, frequently contiguous, forming irregular channels; front surface of supraclypeal area impunctate, polished; frons with small punctures $i<d$ and strong vertical rugae near the ocelli; scutum with small punctures, $i<d$ and strong reticulation; propodeal triangle reticulate with weak, broad sulci at the anterior ends of the peripheral suture; metasoma with fine lineo-reticulation, and sparse punctures becoming dense in the vicinity of the fimbria.

Male. Unknown.

Leioproctus (Euryglossidia) *mungoensis* sp. nov.

urn:lsid:zoobank.org:act:D1CC1FBC-0AA7-427B-B139-68254EA064C9

Fig. 39

Holotype. ♂ Mungo NP, NSW (33.491°S 143.101°E), 26 Aug 2017, J. Tann, AMS K.517235.

Paratypes. 2♀, 2♂ same collection data as holotype, AMS K.517232–34, 36.

Other specimens examined: 5♂ South Australia, A.P. Burgess SAM 32-44786–88, 90.

Diagnosis. Mid-sized, black with iridescent sheen, wings brownish, scutum with close long hair, $ca\ 2\times MOD$ (female) or $2-3\times MOD$ (male), metasoma dorsally with sparse, but conspicuous long hair, frons striate (weak and irregular in male), propodeal triangle with a few short rugae



Figure 38. *Leioproctus (Euryglossidia) mastersi* (Cockerell). ♀: A, dorsal view, scale bar 1 mm; B, clypeus; C, inner hind tibial spur; D, collection locations. Scale bar: 1 mm.

basolaterally, male distinguished from *heterodoxus* by smaller size, unmodified hind leg and flagellum shorter than $1.5 \times \text{HW}$, female distinguished by size and short peripheral sulcus of propodeal triangle.

Description of male. Body length *ca* 7 mm. Relative measurements: HW 100; HL 76; UFW 65; LFW 48; CL 32; FL 120; SL 28.

Inner orbits ventrally convergent; mandible bidentate, smoothly curved; clypeus convex; frontal carina reaching $\frac{3}{4}$ of distance to median ocellus; flagellum moderately short, fl3–fl10 slightly longer than wide; gena about half as wide as compound eye viewed laterally.

Colouration. Black with brassy sheen except on clypeus and supraclypeal area, legs and flagellum dark brown, paler ventrally; apical margins of metasomal terga translucent brown; mandible with dark red apex.

Pubescence. Hair of clypeus and lower paraocular area silver, flattened, adpressed, $3 \times \text{MOD}$; hair of upper paraocular area and interantennal area white, plumose, $2\text{--}3 \times \text{MOD}$; hair of lower gena, scutum and mesepisternum white, erect, almost simple, $3 \times \text{MOD}$; hair on metasoma sparse, simple or very finely branched; sterna without close or dense fringes.

Sculpture. Punctures on clypeus and lower paraocular areas small, dense, $i < d$; anterior surface of supraclypeal area impunctate, weakly reticulate; frons dull, strongly reticulate with weak, fine vertical rugae; scutum strongly reticulate obscuring any punctures; propodeal triangle more coarsely reticulate, anterior ends of peripheral suture with broad scrobiculate sulci; punctures of metasomal terga very small, sparse.

Description of female. Body length *ca* 7.5 mm. Relative measurements: HW 100; HL 75; UFW 71; LFW 62; CL 28; FL 73; SL 31.

Inner orbits ventrally convergent; mandible bidentate, smoothly curved; clypeus convex; frontal carina reaching $\frac{3}{4}$ of distance to median ocellus; flagellum short, segments fl2–fl7 shorter than width; gena about half as wide as compound eye viewed laterally; inner hind tibial spur with *ca* 7 teeth as long as width of spur; claws with large, sharp median tooth.

Colouration. Black with brassy sheen except on clypeus and supraclypeal area, legs and flagellum dark brown, paler ventrally; apical margins of metasomal terga translucent brown; mandible with dark red apex; prepygidial fimbria and dense setae on hind basitibial plate golden brown.

Pubescence. Hair of clypeus and lower paraocular area pale golden-brown, weakly-branched, $2 \times \text{MOD}$, interspersed with slightly longer simple setae; hair of upper paraocular area and lower frons pale, plumose, $2 \times \text{MOD}$; hair of scutum pale golden brown, erect, closely branched, $2 \times \text{MOD}$, interspersed with longer, darker simple setae; hair of mesepisternum pale gold, plumose, $3 \times \text{MOD}$; hair of hind tibial scopa open, white, bipectinate on anterior margin, pale gold, pectinate medially fading to white on posterior margin; metasomal terga with open to sparse cover of fine, weakly branched hair, $1 \times \text{MOD}$; hair of the prepygidial fimbria dense, golden brown, pectinate, $2 \times \text{MOD}$; hair of metasomal sterna S2–S5 close, erect, openly-branched, white, $2\text{--}3 \times \text{MOD}$; apical fringes of S5, S6 dense, $2 \times \text{MOD}$.

Sculpture. Punctures on clypeus and lower paraocular areas mid-sized, $i = 1\text{--}2d$, with weakly reticulate interspaces; anterior surface of supraclypeal area impunctate, weakly reticulate; frons dull, strongly reticulate with weak, fine vertical rugae; punctures of scutum mid-sized, $i \approx 2d$, with strongly reticulate interspaces; scutellum with small punctures, $i < d$, and reticulate interspaces; propodeal triangle more coarsely reticulate, anterior ends of peripheral suture with broad scrobiculate sulci; punctures of metasomal terga

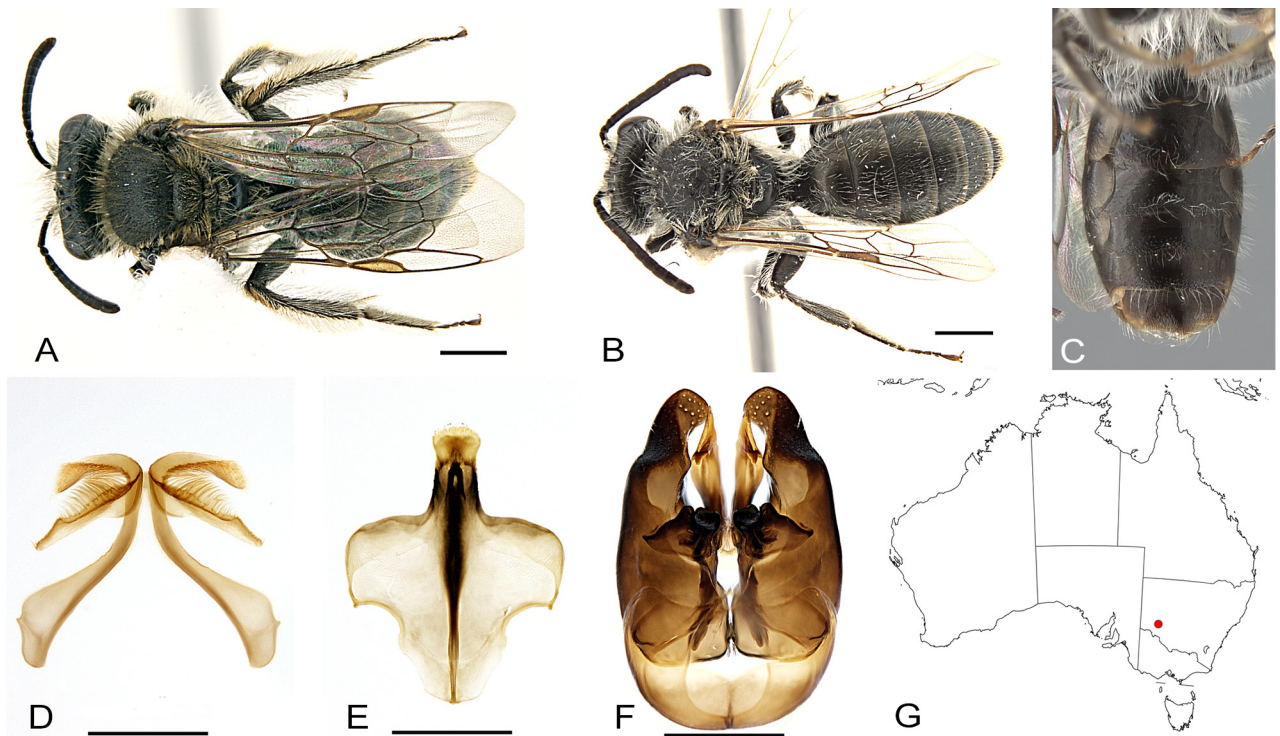


Figure 39. *Leioproctus* (*Euryglossidia*) *mungoensis* sp. nov.: A, ♀ dorsal view; B, ♂ dorsal view; C, ♂ metasomal sterna; D–F, ♂ terminalia ventral views; G, collection locations. Scale bars: A, B, 1 mm; D–E, 500 μm .

very small, sparse, largely obscured by reticulation.

Etymology. The specific epithet is a Latin adjective referring to the collection location for the known specimens.

Leioproctus (Euryglossidia)

murinus sp. nov.

urn:lsid:zoobank.org:act:7BACE682-D8E7-4A23-AA24-2F2A738B11E6

Fig. 40

Holotype. ♂ 56 km E Cunnamulla, QLD (27.999°S 146.272°E), 23 Aug 2008, on *Calotis*, M. Batley, AMS K.362515.

Paratypes. 8♀, 6♂, 27–59km E Cunnamulla, QLD (28°S 146°E), 23–24 Aug 2007, 19 & 23 Aug 2008, M. Batley, on *Calandrinia balonensis*, *Calotis cuneifolia* & *Calotis lappulacea*, AMS K.361716, 19, 24–27, K.362491–93, K.362503, 12–14, K.363326.

Other specimens examined: 3♀, ♂, Gundabooka NP, NSW (30.52°S 145.91°E), 25 Aug 2019, M. Batley, on *Rhodanthe moschata*, AMS K.581017–20.

Diagnosis. Small, black, frons and scutum weakly iridescent, apical margins of metasomal terga translucent (male) or brassy (female), female scutal hair pale brown, close, short, tightly branched, basitibial plate with golden setae, male flagellum slightly longer than head width, clypeus and lower half of frons densely covered with white hair.

Description of male. Body length 4.4 mm. Relative head measurements: HW 100; HL 80; UFW 67; LFW 52; CL 30; FL 115; SL 24.

Inner orbits converge ventrally; mandible bidentate, smoothly curved; clypeus and supraclypeal area gently convex; frontal carina weak extending less than half way to median ocellus; flagellum of moderate length, segments fl3–fl10 slightly longer than wide.

Colouration. Black with dark brown metasoma, except frons and mesosoma dorsally with faint brassy sheen, tibiae and tarsi orange brown with extensive dark infuscation, coxae, trochanters and femora dark brown, metasomal terga with broad, translucent apical margins; mandible amber with dark red tip; flagellum dark brown dorsally, apical half yellow-brown ventrally.

Pubescence. Hair of clypeus, paraocular area, lower frons and gena semi-adpressed, white, tightly-branched, 1–2×MOD; hair on scutum sparse, white, erect, tightly branched, 1×MOD; hair on metasomal terga sparse, except close, adpressed, white on the ventrally facing lateral margins of T2–T4; metasomal S3–S5 with white apical fringes, shortest medially.

Sculpture. Punctures of clypeus and supraclypeal area mid-sized, dense, $i < d$, with reticulate interspaces; frons finely reticulate with close, small punctures, $i \approx d$; scutum densely covered with small punctures, $i \approx d$, with reticulate interspaces, except punctures sparse in small medial areas; propodeal triangle more coarsely reticulate, peripheral suture weak; metasomal terga with satin lineo-reticulation.

Description of female. Body length *ca* 5 mm. Relative head measurements: HW 100; HL 76; UFW 66; LFW 60; CL 29; FL 70; SL 29.

Inner orbits gently convergent ventrally; mandible bidentate, smoothly curved; clypeus convex; frontal carina reaching half way to median ocellus; flagellum short, segments fl2–fl7 shorter than width; gena a little more than half as wide as compound eye viewed laterally; inner hind

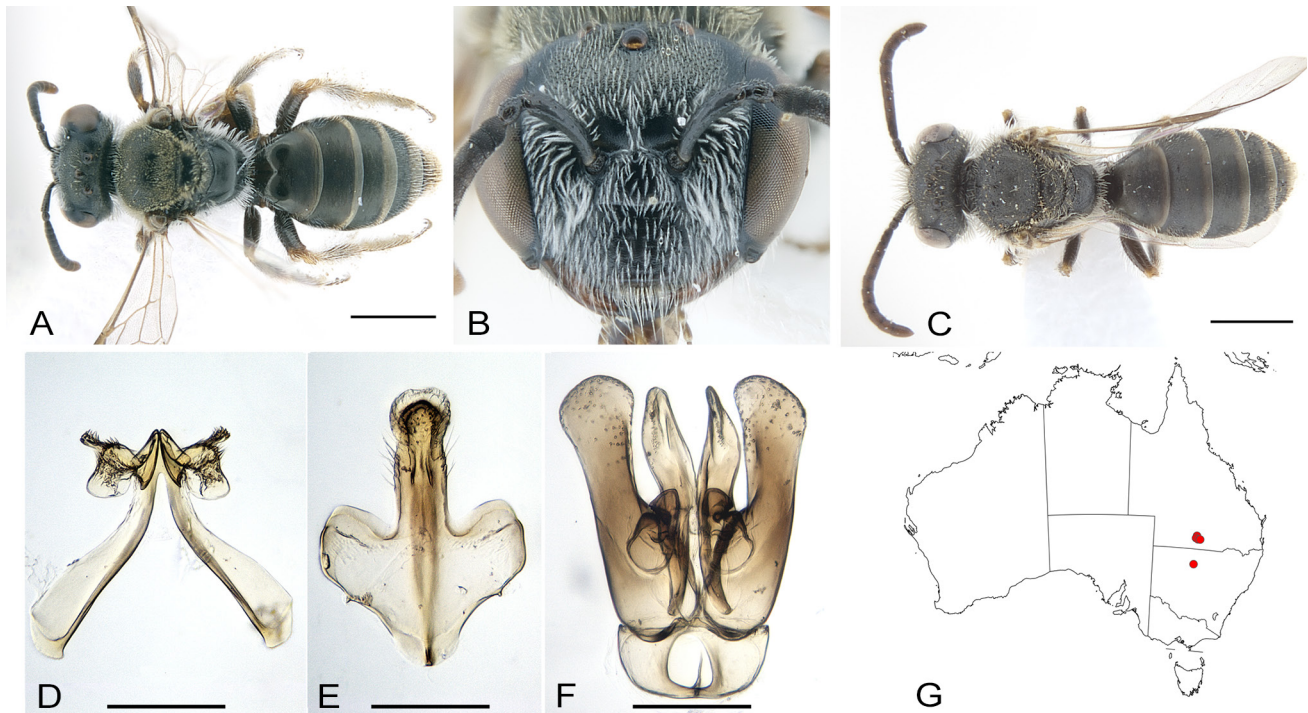


Figure 40. *Leioproctus (Euryglossidia) murinus* sp. nov.: A, ♀ dorsal view; B, ♀ face; C, ♂ dorsal view; D–F, ♂ terminalia ventral views; G, collection locations. Scale bars: A, C, 1 mm; D–F, 200 µm.

tibial spur with *ca* 3 teeth as long as width of spur; claws with small subapical tooth.

Colouration. Black with dark brown metasoma, except frons and mesosoma dorsally with brassy sheen, tibiae and tarsi orange brown with darker infuscation, coxae, trochanters and femora dark brown, metasomal terga with broad, translucent apical margins; mandible amber with dark red tip; flagellum dark brown dorsally, apical half yellow-brown ventrally.

Pubescence. Hair of lower face white, $1\times\text{MOD}$, closely-branched on clypeus, tightly-branched on lower paraocular area; hair of frons pale brown, open, closely-branched, $0.5\times\text{MOD}$; scutal hair pale brown, close, tightly-branched, $<0.5\times\text{MOD}$, interspersed with a few dark brown, simple setae; hair of mesepisternum white, plumose, $>1\times\text{MOD}$; hair of hind tibial scopa sparse, white, bipectinate on anterior edge but pectinate elsewhere, with slight kinking of branch tips; metasomal hair sparse dorsally except for mid-brown prepygidial fimbria; hair of apical $\frac{1}{3}$ of metasomal sterna S2–S5 close, erect, weakly branched, white, $2\text{--}3\times\text{MOD}$; apical fringes of S5, S6 dense, $2\times\text{MOD}$.

Sculpture. Punctures of clypeus and supraclypeal area shallow, mid-sized, $i=0.5\text{--}2d$, with reticulate interspaces; frons finely reticulate with close, small punctures, $i\approx d$; scutum densely covered with small punctures, $i\approx d$, with reticulate interspaces, except punctures sparse in small medial areas; propodeal triangle more coarsely reticulate, peripheral suture weak; metasomal terga with satin lineo-reticulation.

Etymology. The specific epithet is a Latin adjective meaning grey mouse coloured referring to the appearance and the small size.

Leioproctus (*Euryglossidia*)

mutabilis sp. nov.

urn:lsid:zoobank.org:act:0F01F58F-7B08-4E08-82BF-68B34970204D

Fig. 41

Holotype. ♂ 6 km WSW Nalbarra Stn, WA (28.672°S 117.551°E), 3 Sep 1981, T.F. Houston, on *Hakea preissii*, WAM 12077.

Paratypes. 3♂ 4♀ same collection data as holotype, WAM 12073–76, 78–80; 9♀, Mount Gibson Stn, WA (29.623°S 117.357°E), 29 Aug 2001, R. Leijs, on *Grevillea* & *Hakea*, SAM 32-44718, 23–29, 30.

Other specimens examined: 2♀ nr Emu Rock, WA (32.457°S 119.401°E), 9 Oct 1979, T.F. Houston, on *Hakea preissii*, WAM 20825, 26; 1♂ 1♀ 6 km ENE Warriendar, WA (29.113°S 117.242°E), 27 Aug 1981, T.F. Houston, on *Hakea preissii*, WAM 12084, 85; 15♂ 10♀ 5 km SE Thundelarra Stn, WA (28.925°S 117.165°E), 28 Aug 1981, T.F. Houston, on *Hakea preissii*, WAM 12048–72; 3♀ 25 km W Sandstone, WA (27.989°S 119.040°E), 7 Sep 1981, T.F. Houston, on *Hakea multilineata*, WAM12081–83; 2♀ East Yuna, WA (28.419°S 115.203°E), 23 Sep 1983, T.F. Houston & C.A. Howard, on *Grevillea bififormis*, WAM 12086, 87; 1♀ 24 km NW Meeberrie, WA (26.812°S 115.803°E), 28 Aug 1988, R.P. McMillan & T.F. Houston, on *Grevillea eriostachya?*, WAM 12088; 19♀, Mount Gibson Station, WA (29.629°S 117.289°E), 29 Aug 2001, SAM 32-44719–22, 30, 32–45; 2♀, Lochada, WA (29.095°S 116.547°E), R. Leijs, *Grevillea* & *Hakea*, SAM 32-44944, 45; 2♂ 10♀ 6 km E Merredin, WA (31.480°S 118.330°E), 23 Sep 2005, L. Packer, YUC; 1♀, Boorabbin Rock NP, WA (31.266°S 120.020°E), 25 Sep 2005, L. Packer, YUP.

Diagnosis. Mid-sized, black, frons scabrous often with indistinct fine striae in female, scutum shiny with uneven,

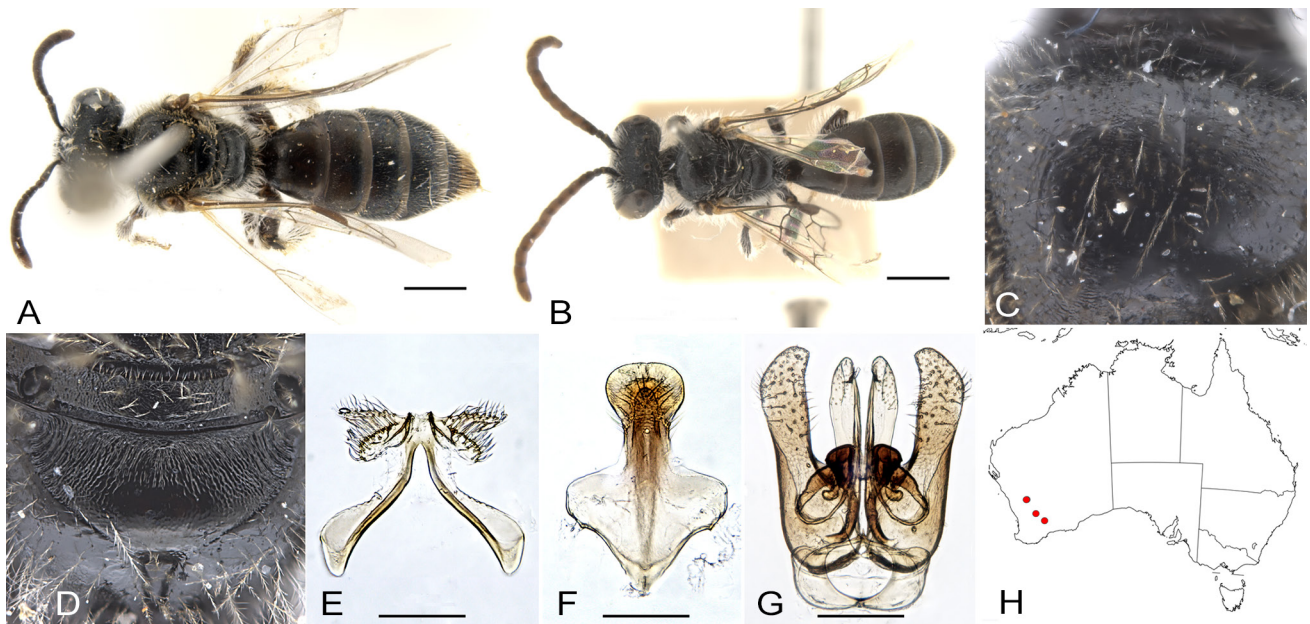


Figure 41. *Leioproctus* (*Euryglossidia*) *mutabilis* sp. nov.: A, ♀ dorsal view; B, ♂ dorsal view; C, ♀ scutum; D, ♀ propodeal triangle; E–G, ♂ terminalia ventral views; H, collection locations. Scale bars: A, B, 1 mm; E–G, 200 μm .

distorted reticulation, propodeal triangle with irregular longitudinal striae to end of subhorizontal area (less distinct in male), distinguished from *striatulus* by distorted reticulation on scutum and longer teeth on inner hind tibial spur of female.

Description of male. body length 5.0 mm. Relative measurements: HW 100; HL 74; UFW 63; LFW 53; CL 25; FL 135; SL 27.

Inner orbits converge ventrally; mandible only slightly curved, bidentate; clypeus and supraclypeal area gently convex; flagellum long, segments fl3–fl10 about twice as long as wide; claws cleft.

Colouration. Black with a weak iridescent brassy sheen; flagellum dark brown, legs black to near apices of femora, remainder dark brown; metasomal sterna dark black; apex of mandible dark red, wings distinctly tinted brown.

Pubescence. Hair of clypeus close, silver, adpressed, flattened, $<2\times\text{MOD}$; of paraocular areas and lower frons white, with short branches, $ca\ 2\times\text{MOD}$; ventral surface of head with beard of white plumose hair, $4\times\text{MOD}$. Hair of scutum erect, white, minutely-branched, $2\times\text{MOD}$ interspersed with a few darker simple setae; sides of mesosoma with white, plumose hair, $2-3\times\text{MOD}$; metasomal hair sparse dorsally, ventrally S4 and S5 have white apical fringes, laterally longer than medially.

Sculpture. Punctures of clypeus, small, $i=d$, with imbricate interspaces; supraclypeal area impunctate medially; punctures of lower paraocular area medium, $i=0.5-1d$; frons scabrous with strong reticulation, any punctures obscured by other sculpture; punctures of scutum and scutellum small, $i=3-4d$, with reticulate interspaces; propodeal triangle with shallow scrobiculate sulci in anterolateral corners.

Description of female. body length $ca\ 7$ mm. Relative measurements: HW 100; HL 74; UFW 69; LFW 54; CL 26; FL 72; SL 31.

Head wide, inner orbits converge ventrally; mandible bidentate, apical $\frac{1}{3}$ strongly curved; labial palpus short; clypeus gently convex, supraclypeal area prominent with distinct dorsolateral and anterior faces; subantennal suture $0.3\times$ basal width clypeus; frontal carina extending to the short triangular sulcus below median ocellus; flagellum moderately short, segments fl2–fl7 about as long as wide; gena slightly narrower than compound eye viewed laterally; inner hind tibial spur with $ca\ 10$ strong, oblique teeth longer than width of spur; claws with sharp medial tooth.

Colouration. Black with a weak iridescent green-gold sheen; flagellum, legs and metasomal sterna dark brown; apex of mandible dark red, wings distinctly tinted brown.

Pubescence. Hair of clypeus, paraocular area, lower frons, and gena white, plumose with short branches, $2\times\text{MOD}$, sparse on clypeus open in remaining areas; scutal hair close, white, erect, plumose with short branches, $\leq\text{MOD}$ longer around margins, interspersed with brown, simple setae, $2\times\text{MOD}$; hair of mesepisternum white, plumose, $2-3\times\text{MOD}$. Hind tibial scopa with close, white, bipectinate hair on anterior margin, pectinate, brownish on posterior margin with simple setae near basitibial plate; hind femoral scopa close, white, plumose. Metasomal hair sparse dorsally apart from mid-brown, pectinate hair of the prepygidial fimbria; hair of apical $\frac{1}{3}$ of metasomal sterna white, erect, weakly-branched, $2-4\times\text{MOD}$; S5, S6 with off-white apical fringes.

Sculpture. Punctures of clypeus, large medially, smaller peripherally, $i=1-2d$, with weak reticulation; supraclypeal area impunctate medially; punctures of lower paraocular area medium, $i=0.5-1d$; frons strongly reticulate, mostly scabrous, frequently with indistinct fine striae, small to medium punctures, $i=1-2d$ and strong reticulation; punctures of scutum and scutellum small, $i=d$, with reticulate interspaces; peripheral suture of propodeal triangle clearly defined; metasoma with satin lineo-reticulation.

Variation. The surface sculpture is more variable than in most other species. In places it is a slightly distorted form of normal pit-reticulation, but in other places becomes wavy lines or fades away.

The observed variation in body length may indicate that this should be regarded as a species group. Female body length for specimens from near Merriden varied from 6.7 to 7.7 mm (mean 6.9, s.d. 0.2, $n\ 10$), while the length of those from Mount Gibson ranged between 5.2 and 6.1 mm (mean 5.6, s.d. 0.2, $n\ 28$). The differences are only partially attributable to distension of the metasoma.

Etymology. The specific epithet is a Latin adjective meaning changeable, referring to the variable nature of the surface sculpture, particularly on the scutum.

Leioproctus (Euryglossidia)

nasutiformis sp. nov.

urn:lsid:zoobank.org:act:8442DB9E-C2DE-4709-A2C7-74C541653B97

Fig. 42

Holotype. ♀ 60 km N Norseman, WA (31.655°S 121.640°E), 18 Sep 2004, M. Batley, on *Eremophila scoparia*, AMS K.360382.

Diagnosis. Mid-sized, black with a slight iridescent sheen, clypeus strongly transversely convex, vertex of head flat viewed anteriorly, hind tibial scopa dense, inner hind tibial spur with two long, thick teeth, outer spur bent apically, with peg-like teeth.

Description of female. Body length 8.0 mm. Relative head measurements: HW 100; HL 82; UFW 73; LFW 72; CL 26; FL 69; SL 34.

Face quadrate with inner orbits more or less parallel and vertex flat viewed anteriorly; clypeus strongly prominent; supraclypeal area gently convex; frontal carina extending half way to median ocellus; flagellum of moderate length, segments fl4–fl9 slightly longer than wide; mandible bidentate, subapical tooth much smaller than apical tooth; gena slightly wider than compound eye viewed laterally; fore calcar with long straight apical spine and about 4 teeth; mid tibial spur long, straight with several minute teeth; inner hind tibial spur with 2 large thick teeth on inner margin and small peg-like teeth on opposite margin; claws with a subapical inner tooth.

Colouration. Black with a slight iridescent sheen, except flagellum and legs dark brown.

Pubescence. Hair of lower face and gena open to sparse, white, closely-branched, $2-3\times\text{MOD}$; hair of scutum and scutellum medially sparse, brown, closely branched, $2\times\text{MOD}$, peripherally close, pale brown, tightly branched, $1\times\text{MOD}$; hair of mesepisternum open, white, finely

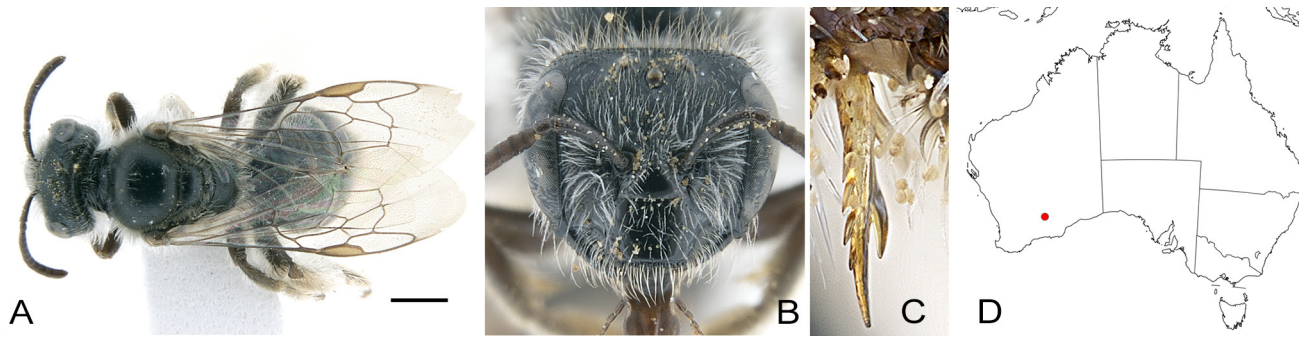


Figure 42. *Leioproctus* (*Euryglossidia*) *nasutiformis* sp. nov. ♀: A, dorsal view, scale bar 1 mm; B, face; C, inner hind tibial spur; D, collection location. Scale bar: 1 mm.

branched, 3–4×MOD; hair of hind tibial scopa dense, white, bipectinate on anterior margin, remainder mostly pale brown, pectinate; metasomal terga with sparse hair except for golden-brown prepygidial fimbria; hair of apical 1/3 of sterna S2–S4 close, erect, plumose, white, 2–3×MOD; apical fringes of S5, S6 dense, tightly branched, 2×MOD.

Sculpture. Clypeus and supraclypeal area shiny with strong, mid-sized punctures and weakly reticulate interspaces; frons scabrous with strong reticulation obscuring small, weak punctures; punctures of scutum and scutellum a mixture of medium and small with reticulate interspaces, i=1–3d, except sparse medially; propodeal triangle with fine reticulation, particularly medially, peripheral suture weak.

Male. Unknown.

Etymology. The specific epithet is from Latin words meaning having the form of and with a snout.

Leioproctus (*Euryglossidia*) *nigrescens*

(Cockerell, 1929)

Fig. 43

Euryglossidia nigrescens Cockerell, 1929: 216.

Leioproctus (*Euryglossidia*) *nigrescens*—Michener, 1965: 69.

Holotype. ♂ Geraldton, WA, 4 Sep 1926, Nicholson, AMS K.95567. **Paratype.** ♀ same data as holotype, AMS K.95568.

Other specimens examined: 1♂, 9♀, 25 km W Southern Cross, WA (31.316°S 119.109°E), 19 Sep 2004, M. Batley, on *Hakea*, AMS K.360404–13; 3♂, 15 km N Westonia, WA (31.198°S 118.759°E), 20 Sep 2004, M. Batley, on *Hakea*, AMS K.359960–62; 1♂ Mount Gibson Station, WA (29.799°S 117.348°E), 21 Aug 2001, R. Leijs, on *Hakea*, SAM 32-44699.

Diagnosis. Small, head and mesosoma black, metasoma black (female) or dark brown basally, almost black apically (male), apical tergal margins translucent, wings hyaline, frons finely striate (partially in male), scutum reticulate, female hind tibial scopa open, white, inner hind tibial spur with three strong teeth, male flagellum moderately long, >1.5×HW, subgeniculate.

Redescription of male. Body length 5.2 mm. Relative head dimensions: HW 100; HL 84; UFW 65; LFW 54; SL 27; FL 174; CL 27.

Clypeus moderately convex, longitudinal convexity stronger ventrally, frontal carina extends from supraclypeal area about half way to median ocellus; scape not reaching median ocellus; mandible bidentate with strong outer ridge; peripheral suture of propodeal triangle with moderately wide, scrobiculate sulcus at anterior end; basitibial plate 0.22× length hind tibia; claws cleft; metasomal terga convex without significantly depressed apical margins.

Colouration. Integument of head and thorax black except mandible apically dark red; scapes dark brown, flagellum brown dorsally, paler ventrally; tegula, tibiae and tarsi mostly yellow-brown with extensive brown marks on tibiae; wings hyaline; metasoma mid-brown becoming darker posteriorly.

Pubescence. Lower face and gena with close, tightly-branched long white hair, 2×MOD; frons with sparse, weakly-branched hair; scutum with sparse, white, almost simple setae, 1×MOD; mesosoma laterally and ventrally with open cover of long, white, plumose hair, 2–3×MOD; legs with a sparse to open cover of simple or finely-branched white hair; metasomal sterna with weak apical fringes, strongest on S4, S5.

Sculpture. Clypeus and supraclypeal strongly reticulate with a dull sheen, small punctures close to dense; frons areolate with some fine striae near median ocellus; scutum and scutellum dull with strong reticulation that obscures any punctures in the holotype; propodeum with strong reticulation with anteriolateral margins scrobiculate; metasoma with slightly weaker reticulation.

Redescription of female. Body length 6.2 mm. Relative head dimensions: HW 100; HL 75; UFW 67; LFW 58; SL 32; FL 74; CL 26.

Clypeus moderately convex; frontal carina reaches half way to median ocellus; scape reaching median ocellus; inner hind tibial spur with 3 strong, well-spaced teeth about twice as long as width of spur; metasomal terga convex without significantly depressed apical margins.

Colouration. Integument of head and thorax black except mandible apically dark red; scapes dark brown, flagellum brown dorsally, paler ventrally; tegula, tibiae and tarsi mostly yellow-brown with extensive brown marks on tibiae; wings hyaline; metasoma black, sometimes with apical margins dark brown.

Pubescence. Paraocular areas, lower frons and gena with close, tightly-branched white hair, 1–2×MOD; scutum with

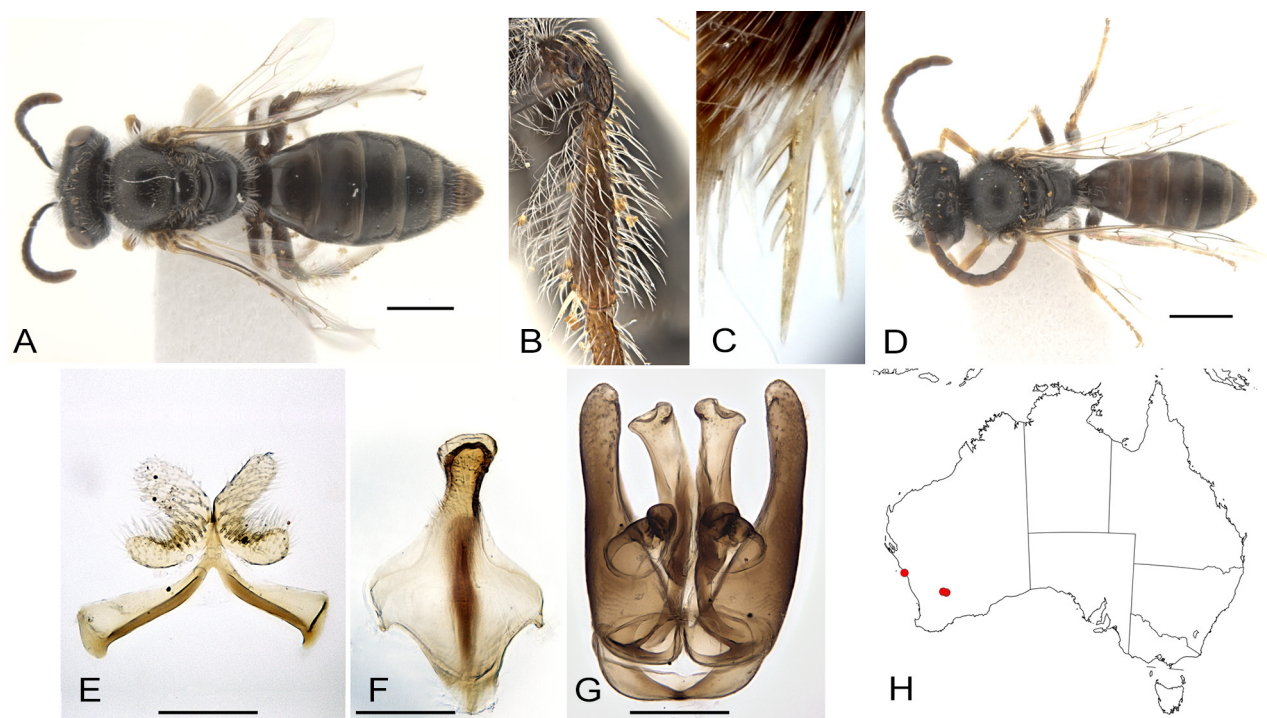


Figure 43. *Leioproctus (Euryglossidia) nigrescens* (Cockerell): A, ♀ dorsal view; B, ♀ hind tibial scopa; C, ♀ inner hind tibial spur; D, ♂ dorsal view; E–G, ♂ terminalia ventral views; H, collection locations. Scale bars: A, B, 1 mm; E–G, 200 µm.

sparse, white, closely branched hair, $0.5 \times \text{MOD}$, interspersed with longer, weakly branched setae; hair of hind tibial scopa open, white, bipectinate anteriorly, simple on posterior margin.

Sculpture. Clypeus and supraclypeal area shining, punctures on clypeus moderately coarse, supraclypeal area impunctate medially; frons striate; scutum and scutellum dull with strong reticulation obscuring punctures; propodeal triangle with strong reticulation, peripheral suture with scrobiculae weak or absent.

Leioproctus (Euryglossidia)

pachygenatus sp. nov.

urn:lsid:zoobank.org:act:E432E37F-40D2-4890-BF6C-F72CA79E6E03

Fig. 44

Holotype. ♂ 53 km E Hyden, WA (32.450°S 119.474°E), 24 Oct 1985, T.F. Houston, on *Grevillea pterosperma*, WAM 12014.

Paratypes. 4♀ same collection data as holotype, WAM 12015–18; 3♀ 2♂, 75 km E Hyden, WA (32.450°S 119.709°E), 24 Oct 1985, T.F. Houston, on *Grevillea eryngioides*, WAM 12019–23; 2♀, 42 km & 62 km E Cramphorne, WA (31.8°S 119.1°E), 20 Oct 2009, M. Batley, on *Grevillea didymobotrya* & *Grevillea excelsior*, AMS K.359779, 82.

Other specimens examined: 14♀ 12♂, nr Emu Rock, WA (32.457°S 119.401°E), 9–14 Oct 1979, on *Hakea preissii* & *Hakea subsulcata*, WAM 11988–12013; 2♀ 4♂, Dryandra, WA (32.780°E 116.968°S), 3 Oct 1985, C.A. Howard & T.F. Houston, on *Grevillea apiculoba*, WAM 12026–31; 1♂,

9 km W Bodallin, WA (31.403°S 118.766°E), 9 Oct 1981, R.W. Thorp, on *Grevillea integrifolia*, WAM 10769; 2♂, N Tarin Rock, WA (32.991°S 118.231°E), 16–18 Oct 1985, T.F. Houston, on *Grevillea eryngioides*, WAM 12032,33; 3♀, 3.5–5.5 km S Yellowdine, WA (31.33°S 119.66°E), 27 Oct 1978, T.F. Houston, on *Grevillea excelsior*; *G. paradoxa* & *G. pterosperma*, WAM 20805, 06, 08–10; 7♂ Cockleshell Gully (30.150°S 115.033°E), 23 Sep 1998, T.F. Houston, on *Stylidium*, WAM 20314–20; 3♂, 15 km N Westonia, WA (31.198°S 118.759°E), 19 Sep 2004, M. Batley, on *Grevillea hookeriana*, AMS K.360394–6; 5♀, Eurardy Hmstd, WA (27.568°S 114.657°E), 9 Oct 2005, L. Packer, YUC; 1♂, Kalbarri NP, WA (27.68°S 114.27°E), 8 Oct 2005, YUC; 1♀, 6 km E Merriden, WA (31.480°S 118.330°E), 23 Sep 2005, YUC; 8♀ 15♂, Boorabbin Rock NP, WA (31.266°S 120.020°E), 26 Sep & 3 Oct 2005, L. Packer, YUC; 1♂, N Tarin Rock, WA (32.991°S 118.231°E), 10 Oct 2005, L. Packer, YUC; 18.4 km N Menzies, WA (29.596°S 121.155°E), 27 Sep 2005, L. Packer, YUC.

Diagnosis. Mid-sized, head and scutum black, metasoma black or dark brown, frons finely striate, scutum and metasomal T1 polished, sparsely punctate, propodeal triangle striate basally, polished apically, male face wide ($\text{HL} < 70$), width gena variable $0.6\text{--}0.9 \times$ width of compound eye viewed laterally, mandible long, subapical tooth of mandible small.

Description of male. Body length ca 6.0 mm. Relative measurements: HW 100; HL 67; UFW 69; LFW 63; CL 20; FL 83; SL 27.

Head wide, inner orbits converge slightly ventrally; mandible long, apical $\frac{1}{3}$ almost straight ending as a sharp tooth (Fig. 44G); gena rectangular, as wide as compound eye viewed laterally (Fig. 44E); claws cleft.

Colouration. Head and mesosoma black, metasoma dark brown with tergal apical margins translucent; basal half of

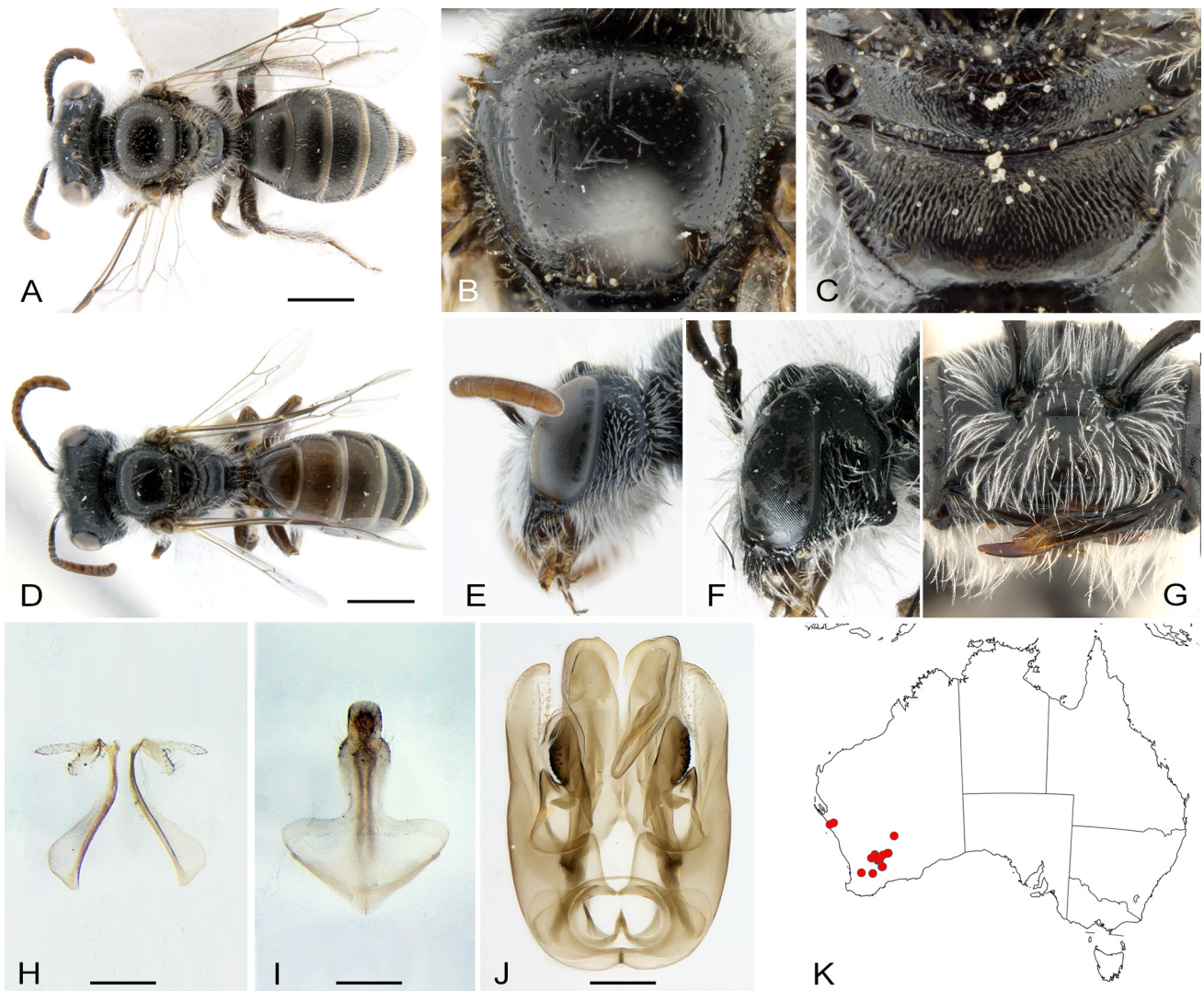


Figure 44. *Leioproctus* (*Euryglossidia*) *pachygenatus* sp. nov.: A, ♀ dorsal view; B, ♀ scutum; C, ♀ propodeal triangle; D, ♂ dorsal view; E, ♂ gena (typical); F, ♂ gena (occasional); G, ♂ mandible; H–J, ♂ terminalia ventral views; K, collection locations. Scale bars: A, D, 1 mm; H–J, 200 µm.

mandible dark brown or black, apical half amber with dark red tip; flagellum brown, paler ventrally; legs dark brown except tarsi and knees (apices of femora and bases of tibiae) yellow-brown; tegula transparent brown.

Pubescence. Hair on lower face and gena open, white, plumose, $2\text{--}3\times\text{MOD}$; scutal hair sparse, weakly branched, $\sim 1\times\text{MOD}$; hair around margin of scutellum similar but slightly longer; sides of mesoscutum with plumose, white hair, $\leq 3\times\text{MOD}$; hair on metasomal terga sparse, except open, white, adpressed on ventrally facing lateral margins of T2–T4; metasomal sterna with apical fringes that become progressively more dense from S2 to S5.

Sculpture. Clypeus, lower paraocular areas and sloping sides of supraclypeal area with small punctures and polished interspaces, $i=1\text{--}2d$; frons finely striate with small punctures, $i=1\text{--}2d$, and dull interspaces; scutum and scutellum with small punctures, sparse medially, $i=2\text{--}3d$ near margins; propodeal triangle with fine striae on basal half, apical half polished; metasomal T1 polished, sparsely punctate, remaining terga reticulate.

Description of female. Body length *ca* 6.5 mm. Relative

measurements: HW 100; HL 76; UFW 66; LFW 58; CL 25; FL 68; SL 29.

Head short, inner orbits parallel; mandible bidentate, smoothly curved; clypeus transversely convex; flagellum short, segments fl2–fl7 wider than long; width of gena more than half width of compound eye viewed laterally; inner hind tibial spur with *ca* 6 teeth half as long as width of spur; claws with sharp subapical inner tooth.

Colouration. Head and mesosoma black, metasoma dark brown, dorsally with bronze sheen; mandible dark brown, flagellum dark brown dorsally, fl3–fl10 orange-brown ventrally; legs dark brown except all tarsi, hind tibia distal to basitibial plate mid-brown; tegula transparent brown.

Pubescence. Hair on lower face and gena open, white, plumose, $2\text{--}3\times\text{MOD}$; scutal hair sparse, weakly branched, $\sim 1\times\text{MOD}$; hair around margin of scutellum similar but slightly longer; sides of mesoscutum with plumose, white hair, $\leq 3\times\text{MOD}$; hair of hind tibial scopa open, white, bipectinate on anterior edge, pectinate elsewhere with a few pale brown, simple setae near basitibial plate; hair on metasomal terga sparse, except open, white, adpressed on ventrally facing lateral margins of T2–T4 and dark brown

prepygidial fimbria; apical $\frac{1}{4}$ of S2–S5 with rows of erect, white, weakly branched hair; S5 & S6 with dense white apical fringes.

Sculpture. Clypeus, lower paraocular areas and sloping sides of supraclypeal area with strong mid-sized punctures and polished interspaces, $i < d$; frons finely striate with small punctures, $i=1-2d$, and dull interspaces; scutum and scutellum with small punctures, sparse medially, $i=2-3d$ near margins; propodeal triangle with fine striae on basal half, apical half polished; metasomal T1 polished, sparsely punctate, remaining terga reticulate.

Variation. The postero-ventral corner of the gena was extended as a blunt projection in one male specimen (Fig. 44F).

Etymology. The specific epithet is a Latin adjective formed from the Greek words for thick and cheeks.

Leioproctus (Euryglossidia) *pachyramus* sp. nov.

urn:lsid:zoobank.org:act:D0330D98-E084-4484-9596-099C3C6B5908

Fig. 45

Holotype. ♀, 15 km N Westonia, WA (31.198°S 118.759°E), 20 Sep 2004, M. Batley, on *Grevillea teretifolia*, AMS K.359979.

Diagnosis. Small, head and mesosoma black, metasoma dark brown, weakly bronze, clypeus highly polished, frons striate near median ocellus, scutum closely punctate with polished interspaces, claws with broad truncate basal tooth.

Description of female. Body length 6.6 mm. Relative head measurements: HW 100; HL 80; UFW 72; LFW 58; CL 30; FL 71; SL 36.

Inner orbits converge ventrally; clypeus flattened basomedially, more strongly convex near ventral and lateral margins; mandible bidentate, outer ridge strong, acetabular groove set well behind outer groove; flagellum short, segments fl2–fl6 shorter than wide; gena slightly more than half as wide as compound eye viewed laterally; inner hind tibial spur with 3–4 coarse, widely-spaced teeth longer than width of spur; claws with large, truncate basal tooth.

Colouration. Head and mesosoma black; metasoma dark brown, terga T2–T5 with translucent apical margins; legs dark brown except joint between fore femur and tibia orange-

brown; flagellum dark brown dorsally, paler ventrally; tegula transparent dark brown.

Pubescence. Clypeal hair sparse, white, weakly-branched, $2 \times \text{MOD}$; hair of lower paraocular areas and lower frons open, plumose, $2 \times \text{MOD}$; on scutum open, mid-brown, plumose, $0.5 \times \text{MOD}$, interspersed longer hair, $1.5 \times \text{MOD}$; on sides of mesosoma white, plumose, $3-4 \times \text{MOD}$, hair of hind tibial scopal open, white, pectinate medially, bipectinate on anterior margin; hair on metasomal terga sparse except for brown prepygidial fimbria; apical $\frac{1}{3}$ of S2 and marginal areas of S3–S5 with close, white, hair, $2-3 \times \text{MOD}$, pectinate on S3–S4, spinulose on S5, S6.

Sculpture. Punctures of lower face strong, small, with highly polished interspaces, in lower paraocular areas and on clypeus basally, $i=1-2 \times d$, on clypeus apically becoming sparse, $i=5-8d$; front face of supraclypeal area impunctate; frons strongly reticulate with deep, almost contiguous, medium punctures, fine rugae near median ocellus; punctures of scutum small, $i \approx d$, with polished interspaces; propodeal triangle shiny/reticulate with peripheral suture forming a narrow scrobiculate sulcus which becomes broad near the anterior ends.

Male. Unknown.

Etymology. The specific epithet is a Latin adjective formed from the Greek word for “thick” and the Latin word for “branch”, referring to the inner tooth of the claws.

Leioproctus (Euryglossidia) *prasinus* sp. nov.

urn:lsid:zoobank.org:act:49DFDDEB-7B29-4FDA-AAA8-D22ED814FC24

Fig. 46

Holotype. ♀ 17 km S Mount Hope, NSW (32.993°S 145.90°E), 13 Sep. 2015, M. Batley, on *Acacia johnsonii*, AMS K.516409.

Diagnosis. Mid-sized, mostly iridescent dark green, frons scabrous, scutum strongly reticulate and dull with open small punctures, $i=1-3d$, hind basitibial plate with gold setae.

Description of female. Body length 7.3 mm. Relative head measurements: HW 100; HL 71; UFW 70; LFW 60; CL 24; FL 70; SL 31.

Inner orbits convergent ventrally; mandible bidentate, smoothly curved; clypeus convex; frontal carina reaching



Figure 45. *Leioproctus (Euryglossidia) pachyramus* sp. nov. ♀: A, dorsal view; B, hind claw; C, collection location. Scale bar: 1 mm.

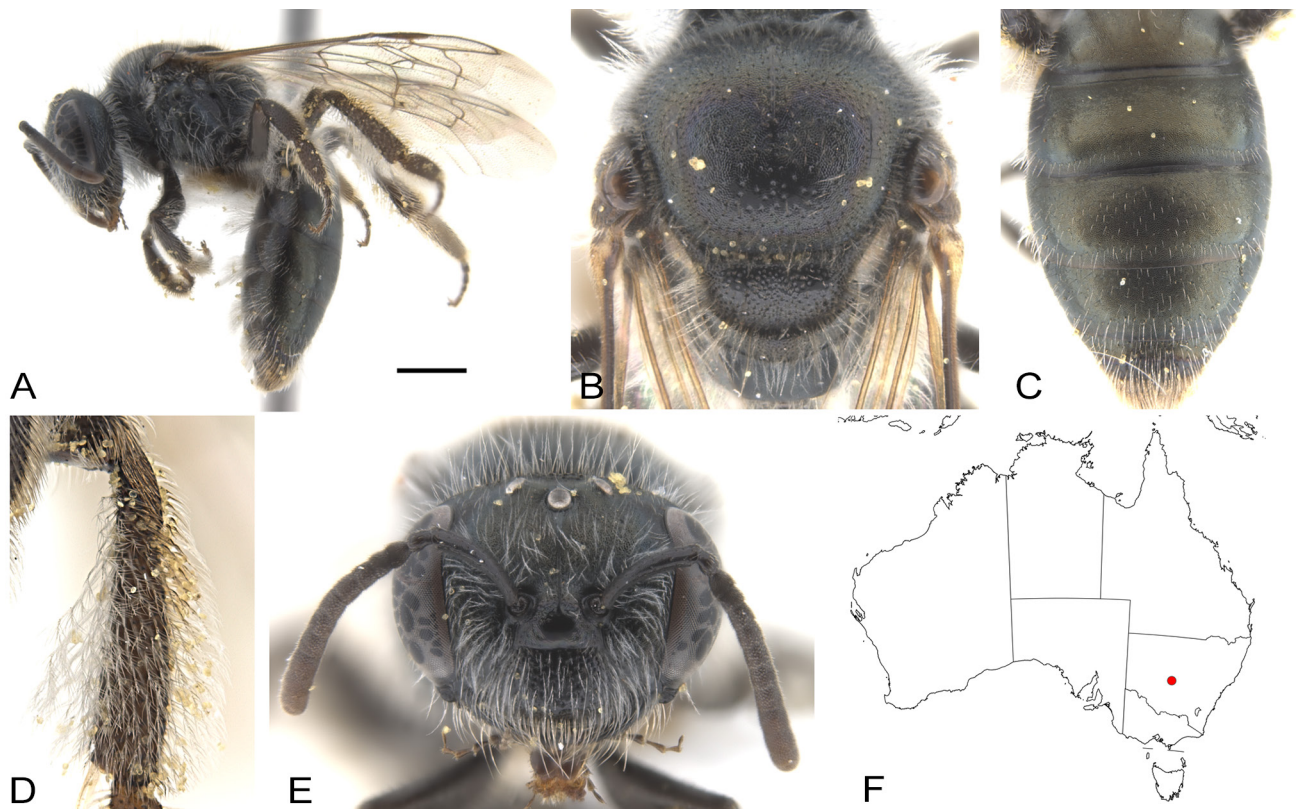


Figure 46. *Leioproctus* (*Euryglossidia*) *prasinus* sp. nov. ♀: A, lateral view, scale bar 1 mm; B, scutum; C, metasoma dorsal view; D, hind tibial scopa; E, face; F, collection location.

almost to ocellus, ending at a deep triangular sulcus; flagellum of moderate length, segments fl5–fl9 longer than wide; inner hind tibial spur with 4 teeth longer than width of spur; claws with small subapical tooth.

Colouration. Brassy green, except clypeus, scapes, mandible and scutum medially black, legs and flagellum dark brown.

Pubescence. Facial hair white, on clypeus and frons sparse, almost simple, $1.5\text{--}2\times\text{MOD}$, in lower paraocular area open, tightly branched, $2\times\text{MOD}$; scutal hair white, open, openly-branched, $2\times\text{MOD}$; hair on mesepisternum white, openly-branched, $3\times\text{MOD}$; hair of hind tibial scopa open, white, mostly bipectinate with many branch tips bent; hind basitibial plate densely covered with golden setae; metasomal hair sparse dorsally except for pale golden-brown prepygidial fimbria; hair on apical $\frac{1}{3}$ of metasomal sterna S2–S4 open, white, erect, weakly branched with bent tips, $3\times\text{MOD}$; apical fringes of S5, S6 dense, $2\times\text{MOD}$.

Sculpture. Punctures on clypeus mid-sized, $i=0.5d$, with polished interspaces, weakly reticulate basally; front surface of supraclypeal area polished, impunctate; frons strongly reticulate largely obscuring punctures like those on clypeus; scutum with medium punctures, $i=1\text{--}3d$, with strongly reticulate interspaces, except postero-medially; propodeal triangle strongly reticulate with anterior half of peripheral suture marked by a moderately wide scrobiculate sulcus; metasomal terga lineo-reticulate producing a satin sheen.

Remark. This species does not closely fit the original description of the missing syntypes of *Lysicolletes singularis* Rayment, 1935 which was described as being dark green. Unlike the *singularis* syntypes, *prasinus* was collected in the eastern half of the continent and, for both reasons is assumed to be a different species.

Etymology. The specific epithet is a Latin adjective meaning leek-green.

Leioproctus (*Euryglossidia*)

punctatifrons sp. nov.

urn:lsid:zoobank.org:act:BC33A95A-8C2E-4655-B660-D8F475451C09

Fig. 47

Holotype. ♀ Commodore Heights, NSW (33.591°S 151.283°E), 9 Sep 2003, M. Batley, on *Grevillea sericea*, AMS K.291245.

Paratypes. 4♂ 1♀, Lane Cove, NSW (33.818°S 151.160°E), 11 Aug 1945, 27 Jul 1946, 10 Aug 1947, N.W. Rodd, AMS K.396109–13; 1♀ Frenchs Forest, NSW (33.76°S 151.23°E), 12 Sep 1957, G. Dolezal, AMS K.396108.

Diagnosis. Mid-sized, head and mesosoma black, metasoma orange-brown with T5–T7 infuscate, tibiae and tarsi orange-brown, frons and scutum strongly punctate with shiny interspaces, scutal hair dark brown, female scopal hair open, dark brown, length male flagellum $<1.5\times\text{HW}$.

Description of female. Body length *ca* 7.3 mm. Relative head measurements: HW 100; HL 80; UFW 69; LFW 60; CL 25; FL 70; SL 33.

Inner orbits sub parallel; clypeus gently convex medially; frontal carina extending less than half way to median ocellus; mandible bidentate, outer ridge prominent; flagellum short, segments fl2–fl7 wider than long; gena more than half as

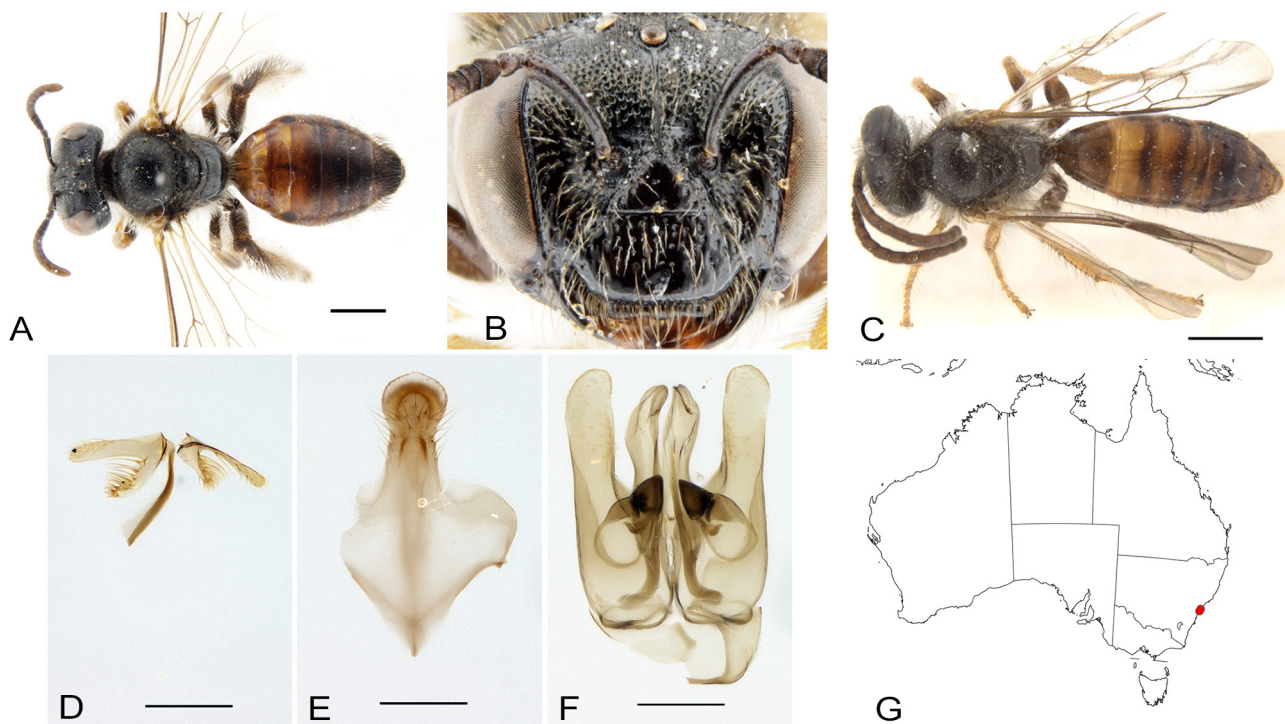


Figure 47. *Leioproctus (Euryglossidia) punctatifrons* sp. nov.: A, ♀ dorsal view; B, ♀ face; C, ♂ dorsal view; D–F, ♂ terminalia ventral views; G, collection locations. Scale bars: A, C, 1 mm; D–F, 200 µm.

wide as compound eye, viewed laterally; inner hind tibial spur with *ca* 6 oblique teeth as long width of spur; claws with strong subapical inner tooth.

Colouration. Head and mesosoma black except lower face occasionally reddish, tarsi, tibiae and distal ends of femora orange-brown, remainder of legs dark brown; metasomal terga orange-brown with darker apical margins, occasionally infuscate; lateral margins of T2 with black, oval mark; apex of mandible dark red, preceded by short amber region; flagellum dark brown dorsally, dull orange-brown ventrally; tegula transparent brown.

Pubescence. Hair on clypeus and in paraocular areas sparse, white, plumose, $2\times\text{MOD}$, interspersed with longer, brown, simple setae; on gena, close, white, tightly branched, $2\times\text{MOD}$; on frons fine, open to sparse, simple brown setae, $0.5\times\text{MOD}$; on scutum open, brown, plumose, $0.5\times\text{MOD}$, interspersed with sparse, weakly-branched, dark brown hair, $\leq 3\times\text{MOD}$; on sides of mesosoma white, plumose, $\sim 3\times\text{MOD}$; hair of hind tibial scopa open, dark brown, pectinate except golden brown, bipectinate on anterior edge and a small number of dark brown simple setae near basitibial plate; hair of metasomal terga sparse except for dark brown prepygidial fimbria; hair on apical half of sterna S2–S5 pale brown, erect, weakly branched, $2\text{--}3\times\text{MOD}$; hair on S5 apically and S6 medially, dense, golden-brown.

Sculpture. Punctures on clypeus strong, medium sized with polished interspaces, $i=1\text{--}2d$ basally becoming $>5d$ ventrally; punctures in paraocular areas medium, $i=2d$; on frons $i<0.5d$ with weakly reticulate, shining interspaces; on scutum and scutellum punctures small punctures, $i=d$, with polished interspaces; propodeal triangle strongly reticulate, peripheral suture indistinct with short scrobiculate region at anterior end; metasomal terga lineo-reticulate but shining, sterna reticulate.

Description of male. Body length: 5.8 mm. Relative head measurements: HW 100; HL 74; UFW 69; LFW 54; CL 24;

FL 135; SL 30.

Inner orbits converging ventrally; clypeus almost flat medially; mandible bidentate, smoothly curved; claws cleft.

Colouration. As for female.

Pubescence. Similar to female, other than scopal hair and prepygidial fimbria, except facial hair denser, scutal hair weakly branched, $1\text{--}2\times\text{MOD}$, hair on metasomal sterna sparse apart from weak fringes on S5, S6.

Surface sculpture. As for female except punctures on clypeus uniformly spaced, $i=0.5d$; on frons $i<0.5d$ (so that frons might be described as areolate).

Etymology. The specific epithet is a Latin noun in apposition referring to the frons of both sexes.

Leioproctus (Euryglossidia) purpurascens (Cockerell, 1914)

Fig. 48

Euryglossidia purpurascens Cockerell, 1914: 197.

Leioproctus (Euryglossidia) purpurascens—Michener, 1965: 69.

Holotype. ♂ Yallingup nr Cape Naturaliste, WA (33.66°S 115.03°E), 14 Sep–31 Oct 1913, R.E. Turner, BMNH Hym.17.a.293— examined using Portal images and specifically requested images provided by NHM.

Cotype. ♀ same collection data as holotype, BMNH NHMUK 015077042— examined using requested images provided by NHM.

Specimens examined: 10♀, 16 km NW Enneabba, WA (29.720°S 115.152°E), 9–12 Sep 1987, T.F. Houston, on *Daviesia*, WAM 10596–605.

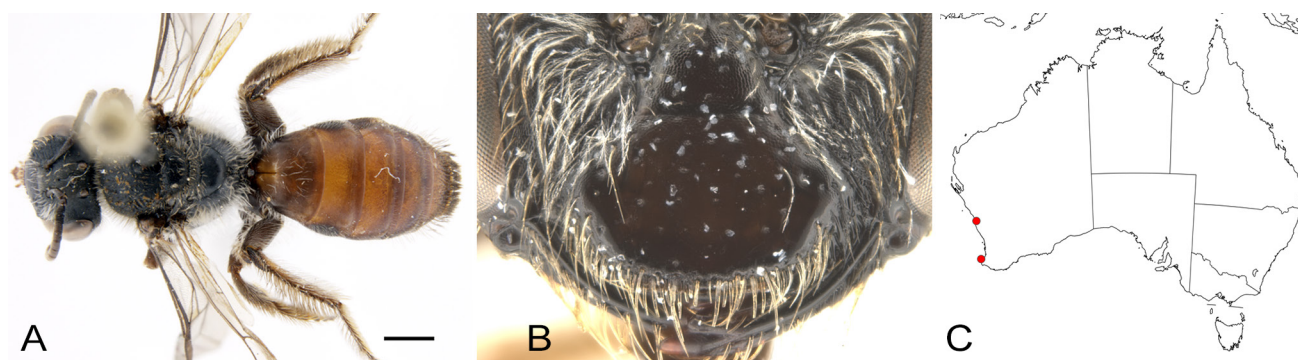


Figure 48. *Leioproctus* (*Euryglossidia*) *purpurascens* (Cockerell) ♀: A, dorsal view, scale bar: 1 mm; B, clypeus; C, collection locations.

Diagnosis. Mid-sized, head and mesosoma black, metasoma red-brown, clypeus almost flat, sparsely punctate with weakly reticulate interspaces (very weak in female), female hind tibial scopal hair sparse, unbranched on posterior margin.

Redescription of male. (measured from images in NHM Portal) Body length 7.9 mm. Relative head measurements: HW 100; HL 79; UFW 68; LFW 57; CL 29; FL 182; SL 27.

Inner orbits slightly convergent ventrally; clypeus almost flat; flagellum long, fl2–fl 11 about 1.5 times as long as wide.

Colouration. Head and mesosoma black, flagellum dark; tegula transparent brown; legs proximally black, tibiae and tarsi red-brown; metasomal T1–T3 red-brown, T4–T6 purplish; wings brown tinted.

Pubescence. Clypeal hair sparse; paraocular areas, lower frons and gena with white, tightly branched hair, 2×MOD; scutal and scutellar hair sparse pale, tightly branched, 2×MOD, mesosoma laterally with open, white, plumose hair, 2–3×MOD; metasomal tergal hair sparse; sternal hair not visible.

Sculpture. Clypeus polished, with sparse, small punctures, i=4–6d; supraclypeal area moderately reticulate; paraocular areas and frons with small punctures, i=1–2d, punctures smaller and weaker on frons; scutum and scutellum with small punctures, i=1–3d, and reticulate interspaces; propodeal triangle more coarsely reticulate.

Redescription of female. Body length 9.3 mm. Relative head measurements: HW 100; HL 78; UFW 69; LFW 64; CL 28; FL 79; SL 34.

Inner orbits weakly ventrally convergent; clypeus weakly convex, almost flat; mandible bidentate gently curved; flagellum of modest length, fl4–fl10 longer than wide; frontal carina reaches halfway to medial ocellus becoming a strongly depressed sulcus; inner hind tibial spur with 5 oblique teeth basally twice as long as width of spur, apically about as long; claws robust, simple.

Colouration. Head and mesosoma black, except clypeus chocolate brown, mandible reddish pre-apically, flagellum dark brown dorsally, mostly dull orange brown ventrally; tegula transparent brown; legs brown with inner face of fore femur and basitarsus yellow-brown; metasomal terga yellow-brown, marginal areas brown, T1 infuscate, T2 with large oval dark mark laterally; sterna yellow-brown; wings brown tinted.

Pubescence. Clypeal hair sparse; paraocular areas, lower frons and gena with white, tightly branched hair, 2×MOD; scutal and scutellar hair sparse to open, golden-brown, tightly branched, 0.5×MOD, interspersed with a few weakly

branched brown setae 2×MOD; mesosoma laterally with white, plumose hair, 2–3×MOD; hair of hind tibial scopa sparse, pale brown weakly branched on anterior margin, brown pectinate medially, pale brown simple on posterior edge; metasomal tergal hair sparse apart from dark brown prepygidial fimbria; sternal hair white, simple or weakly branched, 2×MOD, forming open rows across apical ¼ of S1–S5; S5, 6 with dense apical fringes.

Sculpture. Clypeus shiny, weakly reticulate, with sparse, small punctures, i=4–6d; supraclypeal area more strongly reticulate with similar punctures; paraocular areas and frons with small punctures, i=1–2d, punctures smaller and weaker on frons; scutum and scutellum with punctures obscured by strong reticulation; propodeal triangle more coarsely reticulate, peripheral suture weak; metasomal terga lineo-reticulate with few punctures except near prepygidial fimbria.

Leioproctus (*Euryglossidia*)

pustulatus sp. nov.

urn:lsid:zoobank.org:act:864978BA-3AEC-491B-B485-5020ACFD65C7

Fig. 49

Holotype. ♀ 5 km SE Thundelarra, WA (28.925°S 117.165°E), 28 Aug 1981, T.F. Houston, on *Grevillea yorkrakinensis*, WAM 10766.

Paratypes. 2♀, 5.5 km NE Thundelarra, WA (28.858°S 117.169°E), 31 Aug 1981, T.F. Houston, on *Grevillea yorkrakinensis*, WAM 10767, 68.

Diagnosis. Moderate size, head and mesosoma black, metasoma red-brown, clypeus coarsely sculptured with a medio-apical protrusion.

Description of female. Body length 7.5 mm. Relative head measurements: HW 100; HL 70 (to end marginal area, not projection); UFW 66; LFW 58; CL 26; FL 73; SL 35.

Inner orbits weakly convergent ventrally; clypeus gently convex, marginal area medially with triangular projection about as long, wide and high as MOD; mandible bidentate, with strong outer ridge and wide, flat upper face perpendicular to outer face; supraclypeal area protuberant; frontal carina extends half way to median ocellus; flagellum moderately short, segments fl2–fl5 shorter than wide; inner hind tibial spur almost ciliate with ca 11 fine teeth with the longest about as long as width of spur; claws with sharp basal inner tooth.

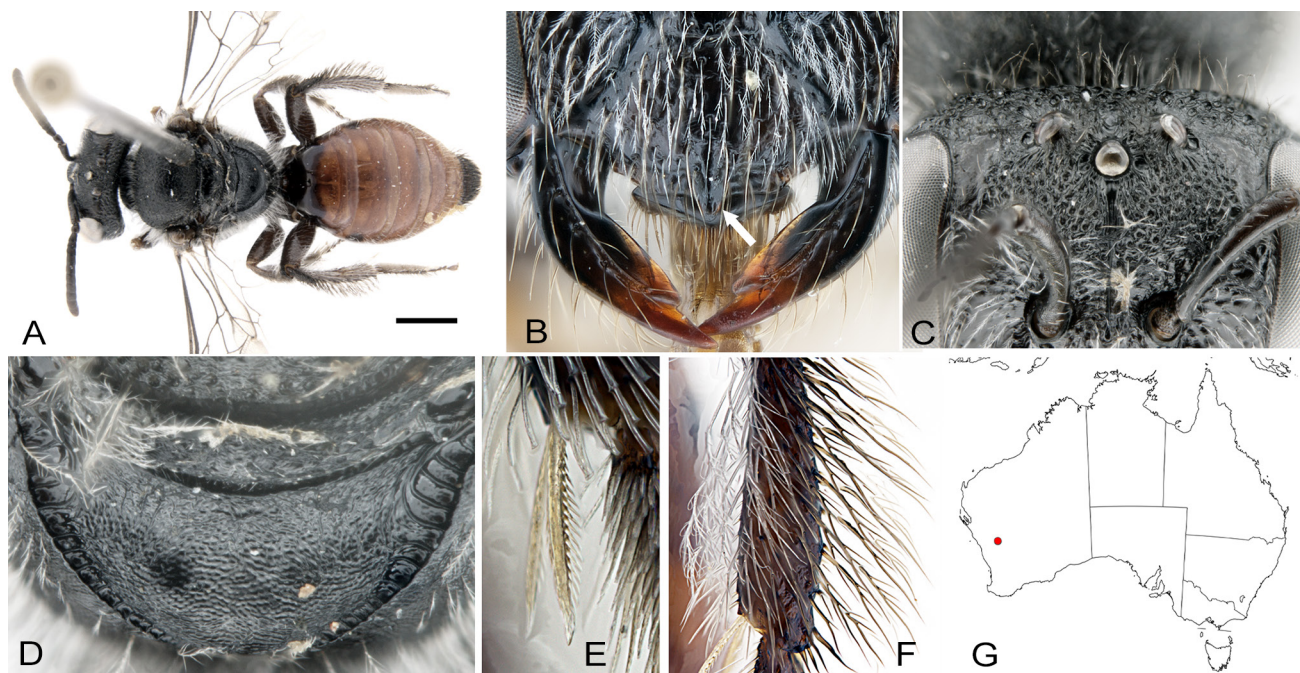


Figure 49. *Leioproctus (Euryglossidia) pustulatus* sp. nov. ♀: A, dorsal view; B, clypeus; C, frons; D, propodeal triangle; E, inner hind tibial spur; F, hind tibial scopa; G, collection location. Scale bar: 1 mm.

Colouration. Head and mesosoma black except flagellum dark brown dorsally, paler ventrally, tegulae transparent brown, legs dark brown with anterior face of fore tibia orange brown; metasoma chestnut, somewhat mottled with anterior face T1, a large oval on T2 laterally and a transverse band pre-apically on T5 dark brown; prepygidial fimbria black or dark brown.

Pubescence. Hair on clypeus sparse, white, plumose 1–2×MOD, interspersed with long simple setae; on paraocular areas and lower frons open, white, plumose, 2×MOD; on scutum open, white or pale brown, plumose 1×MOD; on mesepisternum open, white, plumose, 2×MOD; in hind tibial scopa open, white, bipectinate, with long, openly spaced branches on anterior margin and brown, long and sinuous simple or weakly branched on posterior margin; on metasoma dorsally sparse, except for prepygidial fimbria, sterna S2–S5 with open rows of erect, white, sparsely pectinate hair, 2×MOD and dense apical fringes on S5 and S6.

Sculpture. Clypeus coarsely and irregularly sculptured that might be interpreted as mid-sized and large punctures on a background of wavy ridges, mostly irregular, $i < d$; anterior face of supraclypeal area sparsely punctate, polished, lateral faces strongly punctate; frons also coarsely sculptured, apparently areolate on a strongly reticulate ground; punctures on scutum mid-sized to large, $i = 0.5–1d$, with strongly sculptured interspaces between reticulate and strongly rugulose; scutellum with large, strong, punctures and polished interspaces; propodeal triangle strongly reticulate with longitudinal rugae basally and wide scrobiculate sulci antero-laterally that change into a narrow scrobiculate sulcus that continues to the apex.

Male. Unknown.

Etymology. The specific epithet is a Latin adjective meaning with a pimple, referring to the ventral margin of the clypeus.

Leioproctus (Euryglossidia)

recurvatus sp. nov.

urn:lsid:zoobank.org:act:1C8B268C-4FF8-43D8-9323-0C43AF62848B

Fig. 50

Holotype. ♂, 2 km S Mount Hope, NSW (32.941°S 145.545°E), 3 Sep 2007, M. Batley, on white daisy, AMS K.361122.

Paratypes. 3♀ ♂, same data as holotype, AMS K.359947–50; 2♀, 2 km SE Mount Hope, NSW (32.848°S 145.895°E), 13 Sep 2015, M. Batley, on *Minuria leptophylla*, AMS K.516428, 29; 2♀, 3 km SW Cobar, NSW (31.508°S 145.802°E), 1 Sep 2013, M. Batley, on *Minuria leptophylla*, AMS K.447320, 21.

Diagnosis. Small, head and mesosoma black, metasoma black with translucent tergal margins, frons reticulate with small close punctures, $i \approx d$, female prepygidial fimbria pale, hind basitibial plate with golden setae, male with dense, adpressed white hair below antennal sockets, except in supraclypeal area, females distinguished from *chrysopyga* by black mandibles and wider translucent margins on metasomal terga, males distinguished by curved mid basitarsus.

Description of male. Body length *ca* 5 mm. Relative measurements: HW 100; HL 79; UFW 65; LFW 51; CL 36; FL 100; SL 25.

Inner orbits converge ventrally; mandible bidentate, smoothly curved; clypeus and supraclypeal area gently convex; frontal carina weak extending 0.6 of distance to median ocellus; flagellum of moderate length, segments fl3–fl10 slightly longer than wide; mid basitarsus 0.6 times as long as mid tibia, yellow-brown, gently bowed longitudinally.

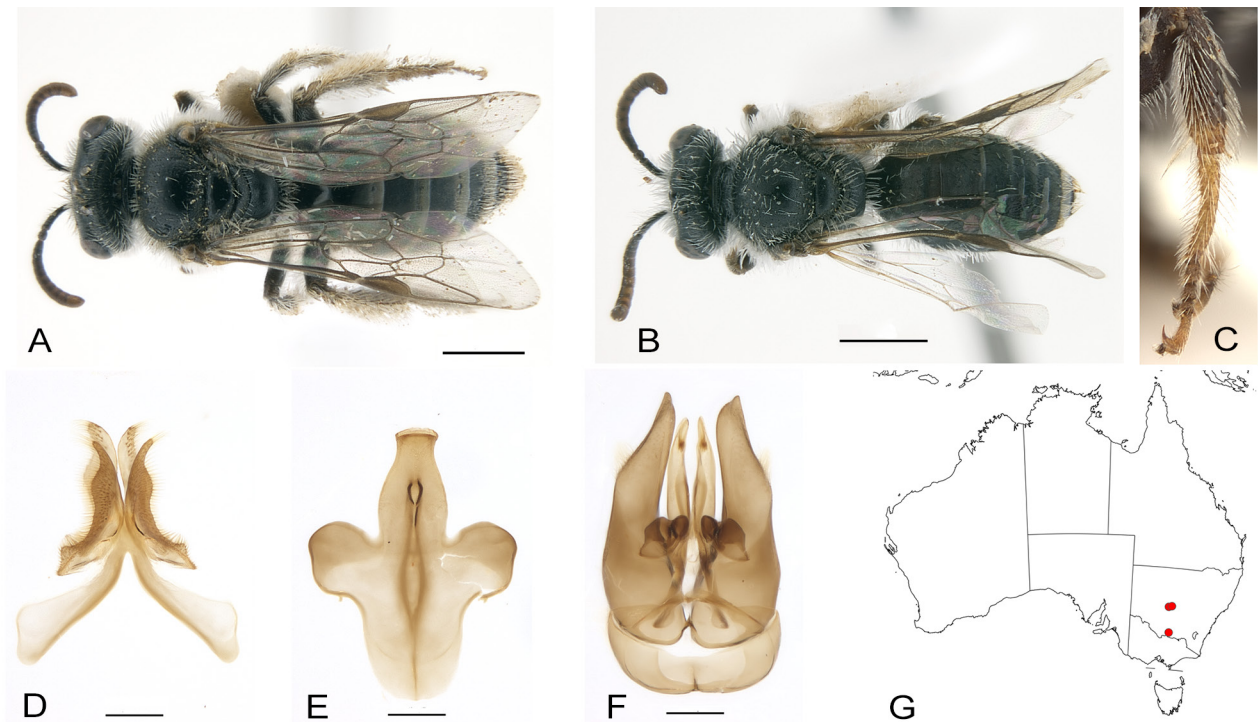


Figure 50. *Leioproctus* (*Euryglossidia*) *recurvatus* sp. nov.: A, ♀ dorsal view; B, ♂ dorsal view; C, ♂ mid basitarsus; D–F, ♂ terminalia ventral views; G, collection locations. Scale bars: A, B, 1 mm; D–F, 200 µm.

Colouration. Black except metasomal tergal margins silvery/translucent, legs brown with basitarsi yellow-brown, flagellum dark brown dorsally, orange-brown ventrally.

Pubescence. Hair of clypeus, paraocular area, lower frons and gena semi-addressed, white, tightly-branched, 1–2×MOD; hair on scutum open to sparse, white, erect, minutely branched, 2×MOD; on mesepisternum and propodeum laterally white, tightly branched, ca 2×MOD; on metasomal terga sparse, except lateral margins of T2–T4 with close, adpressed, white hair and dark oval lateral area on T2; metasomal S5 with pale brown apical fringe, shortest medially; S4 with shorter, less dense fringe of uniform length.

Sculpture. Clypeal punctures moderately weak, small, $i \approx d$; anterior face of supraclypeal area reticulate, impunctate; elsewhere punctures obscured by reticulation; propodeal triangle more coarsely reticulate, with broad scrobiculate sulci at anterior ends.

Description of female. Body length ca 5 mm. Relative measurements: HW 100; HL 79; UFW 70; LFW 60; CL 32; FL 64; SL 28.

Inner orbits gently convergent ventrally; mandible bidentate, smoothly curved; clypeus convex; frontal carina extending half way to median ocellus; flagellum short, length of segments fl2–fl7 less than width; gena little more than half as wide as compound eye viewed laterally; inner hind tibial spur with 3–4 teeth as long as width of spur; claws with small subapical tooth.

Colouration. Black except metasomal tergal margins silvery/translucent, legs brown, flagellum dark brown dorsally, orange-brown ventrally.

Pubescence. Hair of clypeus, paraocular area and lower frons open, white, tightly branched, 1.5–2.0×MOD; scutal hair pale brown, tightly branched, 0.5×MOD, interspersed

with a few longer simple setae; hair of mesepisternum white, plumose, ca 2×MOD; hair of hind tibial scopa open, white, bipectinate on anterior edge, pale brown, pectinate elsewhere; metasomal terga with sparse hair except for orange-brown prepygidial fimbria; hair on apical 1/3 of metasomal sterna S2–S5 close, erect, openly-branched, white, 2–3×MOD; apical fringes of S5 & S6 dense, 2×MOD.

Sculpture. Clypeal punctures strong, mid-sized, irregular, $i=1-4d$, with interspaces moderately reticulate; anterior face of supraclypeal area reticulate, impunctate; punctures of frons small, close, $i \approx d$, with interspaces strongly reticulate; punctures of scutum and scutellum small, $i=2d$, with interspaces reticulate; propodeal triangle more coarsely reticulate, peripheral suture weak.

Etymology. The specific epithet is a Latin adjective meaning bent backwards referring to the mid basitibia of the male.

Leioproctus (*Euryglossidia*)

rostratus sp. nov.

urn:lsid:zoobank.org:act:BE17F2A1-7845-473B-A06B-A48375EB1A20

Fig. 51

Holotype. ♀ 62 km E Hyden, WA (32.450°S 119.570°E), 4 Oct 1978, T.F. Houston & C.A. Howard, on *Hakea coriacea* (now *H. francisiana*), WAM 10770.

Paratypes. 1♀, 16 km S Nerren Nerren, WA (27.274°S 114.628°E), 19 Aug 1980, C.A. Howard & T.F. Houston, on *Hakea bucculenta*, WAM 10771; 1♀, Boorabbin Rock NP, WA (31.266°S 120.020°E), 25 Sep 2005, L. Packer, YUC.

Diagnosis. No other known species has a large snout-like clypeus.

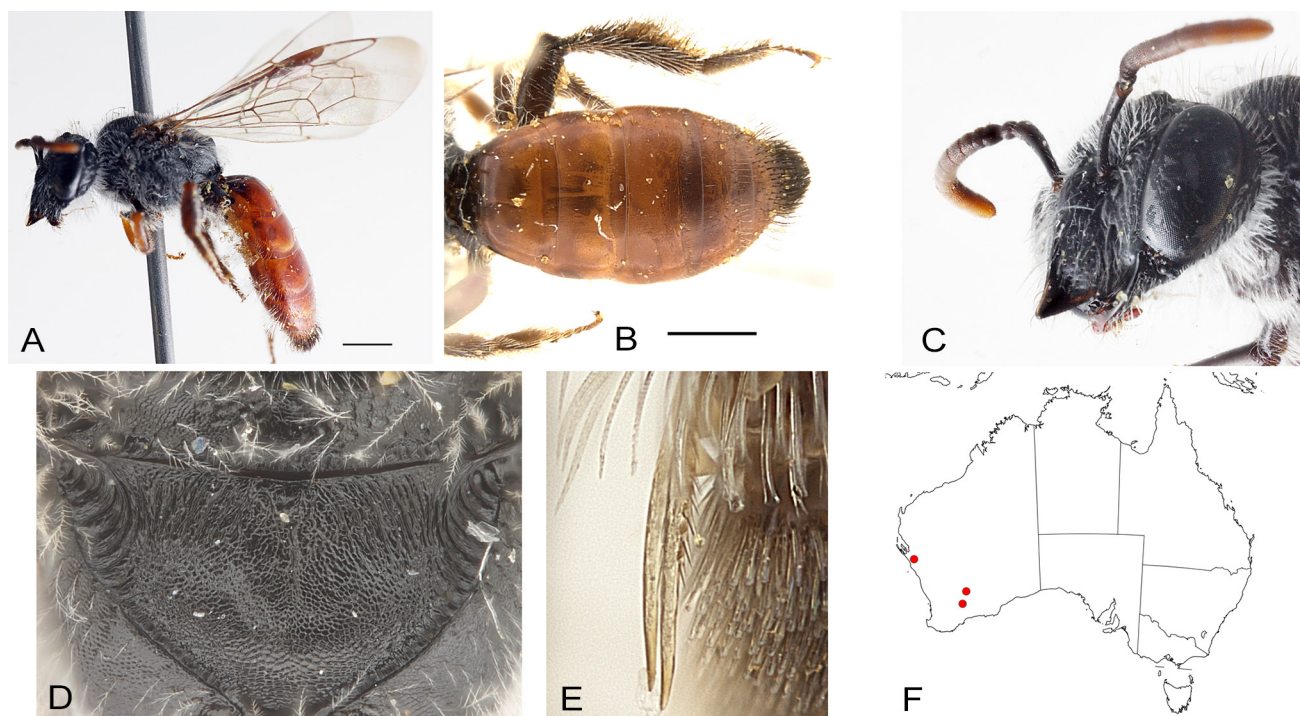


Figure 51. *Leioproctus (Euryglossidia) rostratus* sp. nov. ♀: A, dorsal view; B, metasoma; C, face; D, propodeal triangle; E, inner hind tibial spur; F, collection locations. Scale bars: 1 mm.

Description of female. Body length 7.5 mm. Relative measurements: HW 100; HL 90; UFW 67; LFW 59; CL 38; FL 84; SL 30

Inner orbits almost parallel; apical half of clypeus with strong longitudinal medial carina, apex gently upturned forming a snout; mandible bidentate, smoothly curved, frontal carina reaching less than half way to median ocellus; flagellum moderately long, segments fl1–fl3 shorter than wide; gena almost as wide as compound eye viewed laterally; inner hind tibial spur with 4–6 fine teeth half as long as width of spur; claws with minute subapical tooth; jugal lobe of hind wing 0.67 times as long as distance to cu-v.

Colouration. Head and mesosoma black except legs dark brown, with front surfaces of fore and mid tibia, and fore basitarsus orange-brown; flagellum dark brown dorsally, ventrally segments fl8 onwards orange-brown; mandible dark red apically; tegulae transparent brown; metasoma orange-brown with prepygidial fimbria black.

Pubescence. Hair of clypeus, lower paraocular areas and gena open, white, minutely branched, *ca* 2×MOD, interspersed on clypeus with simple setae; hair of scutum sparse to open, white, minutely branched, *ca* 1×MOD, with interspersed dark simple setae; hair of mesepisternum open, white, plumose, 2×MOD; hair of hind tibial scopa open, white, bipectinate on anterior margin, dark brown, pectinate with long branches medially and on posterior margin; metasoma dorsally with sparse, almost simple hair, except for dark brown prepygidial fimbria; hair of apical 1/3 of metasomal sterna S2–S5 white, open, erect, weakly branched, 2×MOD; apical fringes of S5, S6 pale brown, close, 2×MOD.

Sculpture. Punctures on clypeus, large, contiguous, in places coalescing to form irregular channels, interspaces polished; supraclypeal area medially and basomedial part of clypeus impunctate; punctures on lower paraocular areas

and lateral faces of supraclypeal area large, strong, $i=0.5d$; dense, large punctures on frons somewhat obscured by strong reticulation; punctures of scutum small to medium, $i=2-3d$ with strongly reticulate interspaces; scutellum polished with similar punctures; propodeal triangle strong reticulate with longitudinal rugae basally, surrounded by a wide, deep, scrobiculate sulcus, that narrows towards the rear; metasomal terga almost impunctate.

Male. Unknown.

Etymology. The specific epithet is a Latin adjective meaning beaked.

Leioproctus (Euryglossidia) rubiginosus (Dalla Torre, 1896)

Fig. 52

Euryglossa rubricata Smith, F. 1879: 14. [junior primary homonym of *Euryglossa rubricata* Smith, F. 1879: 12].

Euryglossa rubiginosa Dalla Torre, 1896: 50. [*nom. nov.* for *Euryglossa rubricata* Smith, 1862: 14].

Leioproctus (Euryglossidia) rubiginosus—Michener, 1965: 69.

Holotype. ♀ Swan River, WA BMNH Hym.17.a.2749—examined using requested images provided by NHM; (a note by C.D. Michener, pinned to specimen, states that the abdomen does not belong with the rest of the body).

Other specimens examined: 4♀, Mount Gibson, Lake Moore, WA (29.667°S 117.400°E), 26 Aug 2001, R. Leys, on *Grevillea*, SAM 32-44651–55; 8♂, Mount Gibson Stn, WA (29.7°S 117.3°E), 21–29 Aug 2001, R. Leys, on *Hakea*, SAM 32-44747–54; 2♀, 24 km NW Meeberrie HS, WA

(26.76°S 115.90°E), 28 Aug 1988, R.P. McMillan & T.F. Houston, on *Grevillea didimobotrya*, WAM 19127, 29; 8♀, 13 km S Wannoo, WA (26.93°S 114.63°E), 2 Aug 1985, T.F. Houston, on *Hakea*, WAM 12035–42; 1♀, Tallering, WA (28.38°S 115.85°E), Sep 1976, R.P. McMillan, WAM 12043.

Diagnosis. Small, head and mesosoma black with gold iridescence, metasoma yellow or orange sometimes with darker suffusions (female) or banded yellow/orange and dark brown (male), frons striate, scutum densely punctate, $i < d$, with polished interspaces, female scutal hair dense, pale yellow, tightly branched, distinguished from *brunneipilosus* by iridescent integument and colour of female scutal hair.

Description of female. Body length *ca* 5.5 mm. Relative measurements: HW 100; HL 75; UFW 69; LFW 61; CL 27; FL 80; SL 35.

Inner orbits converge ventrally; mandible bidentate, outer ridge strong; clypeus convex; subantennal suture $0.13 \times$ basal width clypeus; frontal carina weak and short; flagellum short, segments fl2–fl7 wider than long; gena about half as wide as compound eye viewed laterally; inner hind tibial spur with 4–5 teeth as long as width of spur, often with additional short teeth towards base; claws simple; pygidial plate relatively narrow.

Colouration. Head and mesosoma black with iridescent gold sheen; flagellum dark brown dorsally, yellow ventrally; mandible black with a short amber section pre-apically; legs dark brown proximally, fore and mid tibiae and tarsi yellow-brown, hind tibia and tarsus dark brown; metasoma yellow- or orange-brown with variable darker suffusions.

Pubescence. Clypeal hair open, white, plumose, $1.5 \times$ MOD, on paraocular areas and lower frons hair is similar but slightly longer, $2 \times$ MOD; scutal hair dark brown, erect, openly-branched, $< 2 \times$ MOD; hair on mesepisternum white, minutely-branched, $\sim 2 \times$ MOD; hair of hind tibial scopa open, white, bipectinate on anterior half, pale brown, pectinate on posterior half; hind trochanter with open white plumose hair;

metasoma with sparse hair dorsally apart from dark brown prepygidial fimbria; hair of metasomal sterna S2–S5 open, erect, plumose, white, $2\text{--}3 \times$ MOD; apical fringes of S5, S6 dense, plumose, $2 \times$ MOD.

Sculpture. Punctures of clypeus, paraocular and supraclypeal areas medium to large, $i < d$, with weakly reticulate interspaces; frons with contiguous, strong, mid-sized punctures; scutum strongly reticulate, but weakly shiny, punctures obscured by reticulation; scutellar punctures mid-sized, dense, $i < 0.5d$; propodeal triangle reticulate with a weak peripheral suture; metasoma with fine satin lineo-reticulation.

Description of male. Body length 5.2 mm. Relative measurements: HW 100; HL 78; UFW 67; LFW 52; CL 28; FL 145; SL 30.

Inner orbits convergent ventrally; mandible bidentate, smoothly curved; clypeus and supraclypeal area gently convex; frontal carina extending more than half way to median ocellus; flagellum of moderate length, segments fl3–fl10 longer than wide.

Colouration. As for female, but iridescent sheen weaker, metasomal terga dark brown with orange-brown bands across anterior part of T2–T4, sterna yellow-brown, hind tibia often paler.

Pubescence. Hair on face like that for female but pale brown and longer, $2 \times$ MOD, hair on scutum erect, brown, plumose, *ca* $2.5 \times$ MOD, hair on mesepisternum longer, $3 \times$ MOD and hair on metasoma sparse apart from white apical fringe, $0.5 \times$ MOD, on S5.

Sculpture. Similar to female except reticulation slightly stronger, punctures on clypeus and lower paraocular areas mid-sized, $i = 1\text{--}2d$; punctures of frons mid-sized, contiguous, shallower than for female; scutal punctures small, $i = 1\text{--}2d$.

Variation. In addition to the variable colour of the female metasoma, the eight females from Wannoo have yellow mandible, labrum and ventral margin of clypeus.

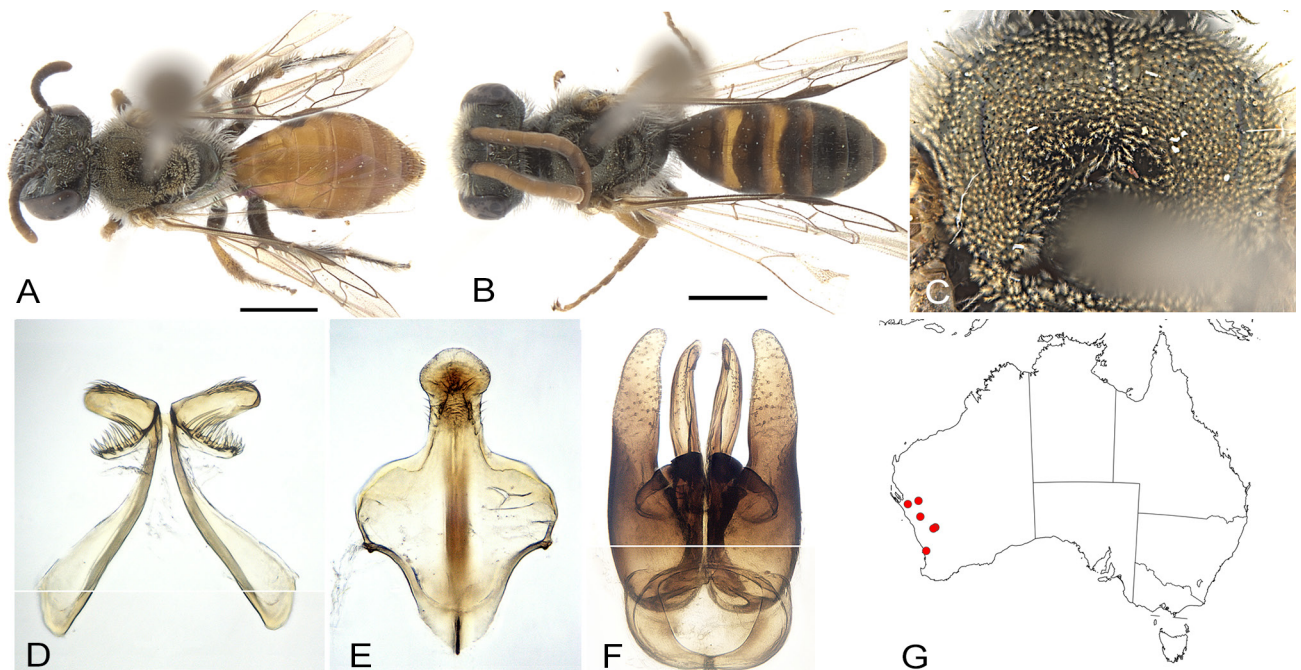


Figure 52. *Leioproctus* (*Euryglossidia*) *rubiginosus* (Dalla Torre): A, ♀ dorsal view; B, ♂ dorsal view; C, ♀ scutum; D–F, ♂ terminalia ventral views; G, collection locations. Scale bars: A, B, 1 mm; D–F, 200 μ m.

*Leioproctus (Euryglossidia)**sarogaster* sp. nov.

urn:lsid:zoobank.org:act:49EEF961-2FA8-4C65-AC46-BC3FB7667410

Fig. 53

Holotype ♂ 65 km E Southern Cross, WA (31.261°S 120.027°E), 19 Aug 2008, R. Leys, on *Acacia*, SAM 32-44678.

Paratypes 11♂ 1♀, same collection data as holotype, SAM 32-44673, 77, 79–89.

Diagnosis. Small black, frons areolate, scutum strongly reticulate, metasoma with satiny sheen, male flagellum bright yellow-brown ventrally, basitarsi yellow-brown, female with compact, stiffly branched hair on S2–S4.

Description of male. Body length 5.9 mm. Relative head measurements: HW 100; HL 80; UFW 65; LFW 49; CL 30; SL 27; FL 140.

Inner orbits strongly ventrally convergent; mandible bidentate, smoothly curved; clypeus and supraclypeal area transversely convex; frontal carina extending about half way to median ocellus; flagellum long, segments fl2–fl11 longer than wide.

Colouration. Black except flagellum bright yellow-brown ventrally, all basitarsi and both ends of tibiae yellow-brown.

Pubescence. Hair on clypeus and lower paraocular areas dense, white, adpressed, tightly branched 2.5×MOD; hair on lower frons similar but erect and more plumose; gena with beard of similar hair; scutal hair sparse, erect, pale, weakly-branched, 2.5×MOD; sides of mesosoma with open to sparse long white hair, <3×MOD; metasomal hair sparse except lateral (i.e. ventral) margins of T2–4 with open, semi-adpressed, finely branched white hair; S4, S5 with white

apical fringes, 1×MOD, longer laterally, on S4, 0.5×MOD on S5, S3 with a weaker apical fringe.

Sculpture. Clypeal punctures small, $i \approx d$, with reticulate interspaces; frons areolate; scutum and scutellum with small punctures, $i \approx 2d$; propodeal triangle reticulate with a wide scrobiculate peripheral sulcus; metasomal terga with strong, satin lineo-reticulation.

Description of female. Body length 5.8 mm. Relative head measurements: HW 100; HL 77; UFW 70; LFW 62; CL 27; SL 33; FL 75.

Clypeus longitudinally and transversely convex; supraclypeal area prominent, front surface convex; frontal carina extending about half way to median ocellus; flagellum moderately short, segments fl4–fl9 about as long as wide; inner hind tibial spur with 3 stout teeth longer than width of spur; claw with small subapical inner tooth.

Colouration. Black except flagellum dorsally, tegula and legs dark brown, flagellum ventrally orange-brown, fore and mid femora yellow-brown basally, wings with some veins yellow pigmented; metasomal terga with brownish marginal areas.

Pubescence. Hair on clypeus, paraocular areas, lower frons and gena open, white, closely branched, 1–2×MOD; scutal hair short, open, pale brown, minutely-branched, ca 0.4×MOD interspersed with sparse long, dark brown simple setae; sides of mesosoma with open to sparse, openly-branched, white hair, <3×MOD; hair of hind tibial scopa open, white, bipectinate on anterior half, pectinate or weakly branched on posterior half; metasomal hair sparse except on lateral (i.e. ventral) margins of T2–T4 with open, semi adpressed, plumose white hair; apical half of S2–S4 with close, erect, white, stiffly branched hair, 2×MOD; S5 & S6 with dense apical fringe.

Sculpture. Clypeal punctures small, $i \approx 2d$ with reticulate interspaces; frons areolate with moderately strong

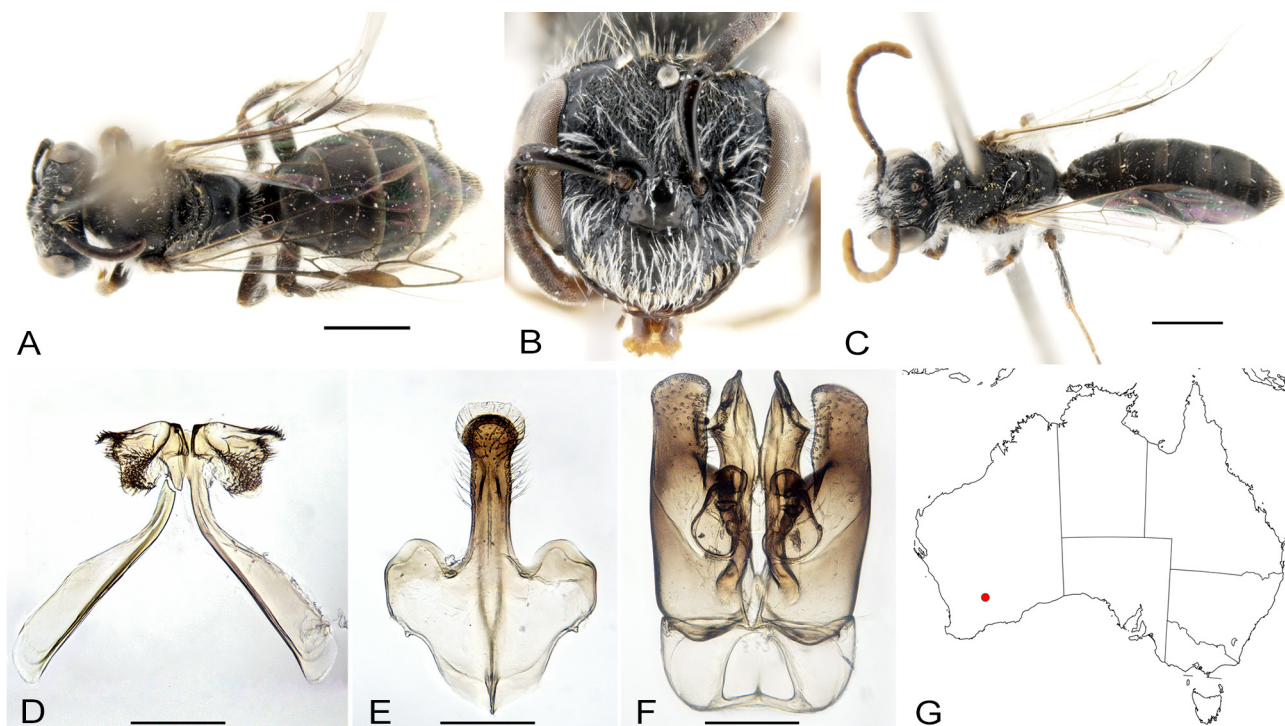


Figure 53. *Leioproctus (Euryglossidia) sarogaster* sp. nov.: A, ♀ dorsal view; B, ♀ face; C, ♂ dorsal view; D–F, ♂ terminalia ventral views; G, collection locations. Scale bars: A, C, 1 mm; D–F, 200 µm.

reticulation in the areolae; scutum and scutellum with small punctures, $i \approx 2d$; propodeal triangle strongly reticulate with a weak, broad sulcus marking the anterior half of the peripheral suture; metasomal terga with strong, satin lineo-reticulation.

Etymology. The specific epithet is a noun in apposition formed from the Greek words for brush and belly referring to the sternal hair of the female.

***Leioproctus* (*Euryglossidia*)
sericeus sp. nov.**

urn:lsid:zoobank.org:act:3D3C8DA6-68D8-45FA-BFD2-430AA7B3E823

Fig. 54

Holotype. ♀ Thundelarra Stn., Meleya Well, WA (28.959°S 117.201°E), 28 Aug–2 Sep 1981, T.F. Houston, on *Eremophila longifolia*, WAM 19890.

Paratypes. 6♀, same collection data as holotype, WAM 19891–96; 1♀, 145 km N Cook, WA (29.48°S 130.17°E), 20 Aug 1980, G.J. Baker, on *Thryptomene*, SAM 32-44779; 1♀, Bungalbin Hill, WA (30.290°S 119.687°E), 11–18 Sep 1987, T.F. Houston, on *Commersonia crispera*?, WAM 20750; 1♀, East Yuna NR, WA (28.419°S 115.203°S), 23–24 Sep 1983, T.F. Houston & C.A. Howard, on *Keraudrenia*, WAM 20823; 2♀, Mount Gibson Stn, WA (29.687°S 117.360°E), 22 Aug 2001, R. Leys, on *Eucalyptus*, SAM 32-44708–09.

Diagnosis. Small, head and mesosoma black occasionally with brassy tints, metasoma satiny black with bronze apical tergal margins, frons with dense punctures sometimes visible only when viewed obliquely, scutum closely punctate with reticulate interspaces.

Description of female. Body length 5.5 mm. Relative head measurements: HW 100; HL 75; UFW 70; LFW 56; CL 28; FL 75; SL 30. 32-44708

Inner orbits converge ventrally; mandible bidentate, smoothly curved; clypeus convex, supraclypeal area prominent; frontal carina extends 2/3 of way to median ocellus; flagellum moderately short, segments fl2–fl9 wider than long; gena *ca* half as wide as compound eye viewed laterally; inner hind tibial spur with 6 oblique teeth longer than width of spur; peripheral suture of propodeal triangle indistinct; claws with sharp subapical tooth.

Colouration. Black except scutum and metasoma sometimes with slight brassy tint, flagellum dark brown dorsally, mostly yellow-brown ventrally, legs dark brown with joints between femur and tibia of front and mid legs

yellow-brown, wings hyaline, slightly iridescent.

Pubescence. Hair on clypeus, paraocular areas and lower frons open to sparse, white, closely branched, $2 \times \text{MOD}$; scutal hair open, pale brown, erect, openly-branched, $1 \times \text{MOD}$; hair of mesepisternum white, plumose, $\sim 2 \times \text{MOD}$; hair of hind tibial scopula open, white, bipectinate on anterior half, becoming pale brown, pectinate on posterior margin; metasomal hair sparse dorsally apart from golden brown prepygidial fimbria; hair of metasomal sterna S2–S5 open, erect, white, with long openly spaced branches with some crinkled tips, $2\text{--}3 \times \text{MOD}$; apical fringes of S5, S6 dense, $2 \times \text{MOD}$.

Sculpture. Punctures on clypeus, paraocular and supraclypeal areas small, $i=1\text{--}2d$, interspaces weakly reticulate; frons strongly reticulate with dense coarse punctures sometimes visible only when viewed obliquely from above; scutum medially weakly reticulate and shiny, more strongly reticulate around margins, punctures small, $i=6\text{--}10d$; scutellum shining medially; propodeal triangle reticulate with weak peripheral suture.

Male. Unknown.

Etymology. The specific epithet is a Latin adjective meaning silky or satiny, referring to the metasomal terga.

***Leioproctus* (*Euryglossidia*) *simillimus*
(Smith, 1879)**

Fig. 55

Euryglossa simillima Smith, 1879: 12.

Euryglossa ichneumonoides Cockerell, 1906: 17. **new synonymy.**

Leioproctus (*Euryglossidia*) *simillimus* (Smith)—Michener, 1965: 69.

Leioproctus (*Euryglossidia*) *ichneumonoides* (Cockerell)—Michener, 1965: 69.

Holotype. ♀ of *simillima*, Swan River, WA, NHM Hym.17.a.292— examined using Portal images and specifically requested images provided by NHM; missing left fore and mid legs, hind tarsus, and right hind tarsus, metasoma posterior end glued to mesosoma.

Holotype. ♂ of *ichneumonoides*, WA, BMNH Hym.17.a.290— examined using NHM Portal images; left antenna, left fore tarsus and right hind tarsus missing.

Other specimens examined. 139♀ 16♂, 13 km S Wannoo,



Figure 54. *Leioproctus* (*Euryglossidia*) *sericeus* sp. nov. ♀: A, dorsal view, scale bar 1 mm; B, scutum; C, face; D, collection locations.

WA (26.930°S 114.625°E), 30–31 Jul 1985 & 21–23 Aug 1985, T.F. Houston, on *Hakea* & *Thryptomene*, WAM 10791–858, 862–932, 938–953; 3♀ 8 km NE Tamala, WA (26.648°S 113.771°E), 21–23 Aug 1980, C.A. Howard & T.F. Houston, on *Hakea candolleana* & *Scholtzia drummondii*, WAM 10859–61, 10936; 2♀ 2♂, 11 km NE Eurardy, WA (27.498°S 114.751°E), 23 Aug 1986, T.F. Houston, on *Grevillea commutata*, WAM 10933,34, 60, 61; 7♂, Balline Stn, WA (27.9833°S 114.2167°E), 24–25 Jul 1979, A.M. & M.J. Douglas, WAM 10954–59, 20831; 1♀, East Yuna NR, WA (28.419°S 115.203°E), 23–24 Sep 1983, C.A. Howard & T.F. Houston, on *Grevillea*, WAM 10935; 1♀, Green Head, WA (30.065°S 114.966°E), 2 Sep 1981, R.P. McMillan, WAM 10937.

Diagnosis. Mid-sized, head and mesosoma black, female metasoma either orange-brown with T5, T6 black (with a steel blue sheen) or entirely black (with iridescent sheen), male metasoma variable from orange-brown to dark brown, frons coarsely areolate, scutum strongly reticulate, propodeal triangle with strong rugae, male flagellum more than twice

as long as head width.

Redescription of female. Body length 7.8 mm. Relative head measurements: HW 100; HL 75; UFW 68; LFW 60; CL 26; FL 71; SL 36.

Inner orbits almost parallel; clypeus convex, but almost flat basomedially; mandible bidentate gently curved; flagellum of moderate length, fl3–fl8 about as long as wide; frontal carina extending halfway to median ocellus; inner hind tibial spur with 3 or 4 curved teeth twice as long as width of spur; claws with a very small basal tooth.

Colouration. Head and mesosoma black, except mandible dark red apically with a short amber pre-apical region, flagellum dark brown dorsally, ventrally apical half yellow brown; legs dark brown; metasoma orange-brown with T5, T6 steel blue or metasoma entirely steel blue with apical tergal margins slightly bronze.

Pubescence. Clypeal hair sparse, white, plumose, 1–2×MOD; on lower paraocular and interantennal areas and on gena, open, white, closely branched, 1–2×MOD; scutum and scutellum with sparse to open, minute, golden-

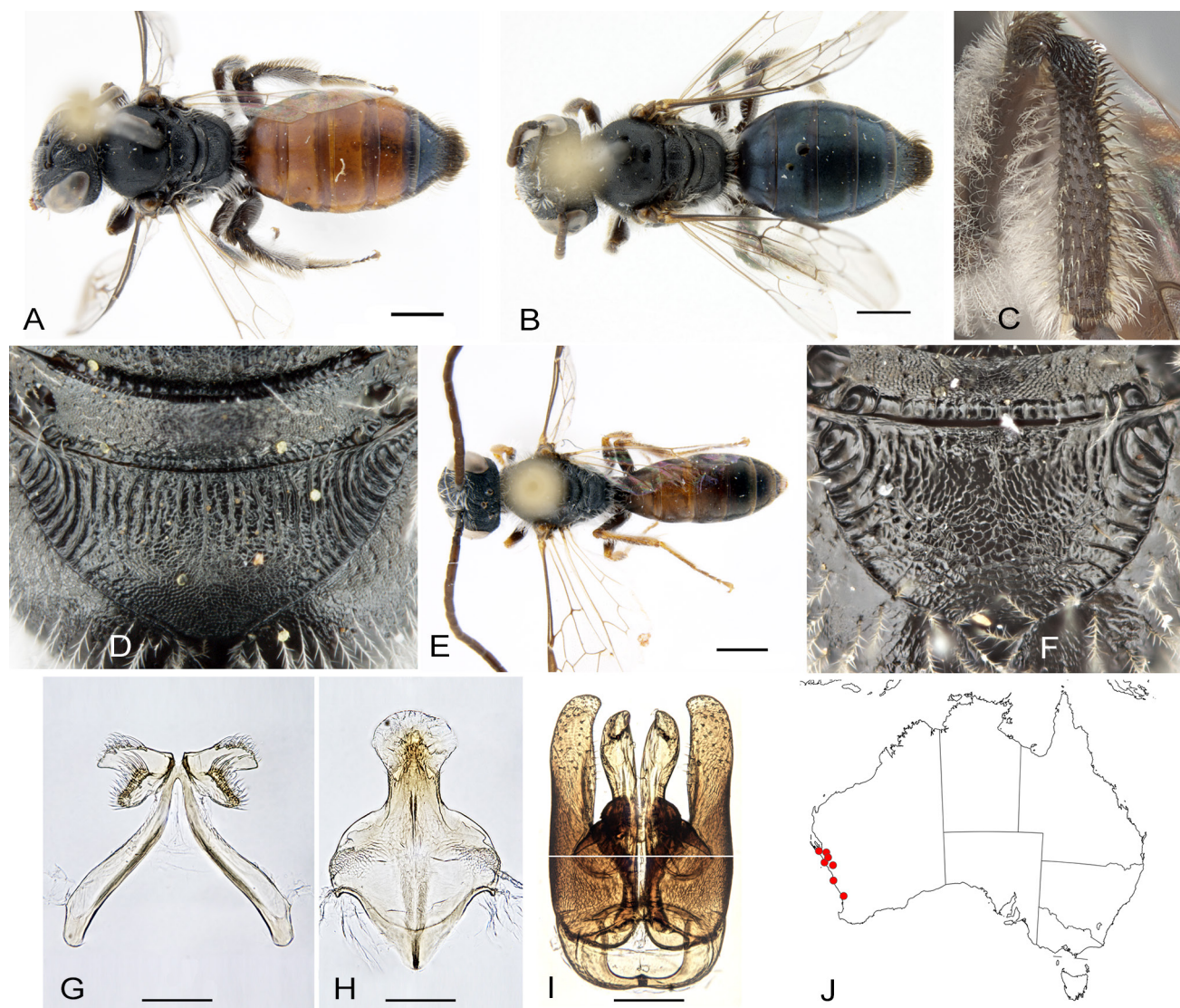


Figure 55. *Leioproctus (Euryglossidia) simillimus* (Smith): A, ♀ colour form A, dorsal view; B, ♀ colour form B, dorsal view; C, ♀ hind tibial scopa; D, ♀ propodeal triangle; E, ♂ dorsal view; F, ♂ propodeal triangle; G–I, ♂ terminalia ventral views; J, collection locations. Scale bars: A, B, E, 1 mm; G–I 200 µm.

brown hair, $0.2 \times \text{MOD}$, interspersed with dark, erect, simple setae, $1.5 \times \text{MOD}$; hair on sides of mesosoma open, white, weakly branched, $2 \times \text{MOD}$; hair of hind tibial scopa open, white, bipectinate with crinkled tips on anterior margin, pectinate and short medially becoming pale brown and weakly branched on posterior margin; hair on metasomal terga sparse except for black prepygidial fimbria; sterna with sparse subapical rows of weakly pectinate, white hair, $1-2 \times \text{MOD}$; S5, S6 with dense apical fringes.

Sculpture. Clypeus with large, strong punctures, and shiny, weakly reticulate interspaces, smaller punctures laterally; anterior face of supraclypeal area largely impunctate, shiny but weakly reticulate; lower paraocular areas with medium punctures, $i \leq d$; frons coarsely areolate; scutum and scutellum dull with fine, strong reticulation and small punctures; scutellum similar with slightly larger punctures; propodeal triangle strongly reticulate with well-spaced longitudinal rugae on basal half, peripheral suture weakly indicated; metasomal terga lineo-reticulate with few punctures except near prepygidial fimbria.

Redescription of male. Body length 7.0 mm. Relative head measurements: HW 100; HL 74; UFW 67; LFW 53; CL 29; FL 242; SL 27.

Inner orbits converging ventrally; clypeus convex, but almost flat basomedially; flagellum long ($>2 \times \text{HW}$), all segments except first more than twice as long as wide; frontal carina extending halfway to median ocellus; claws cleft.

Colouration. Similar to female except metasomal colour varies from clear orange-brown to dark brown.

Pubescence. Hair of head and mesosoma as for female, but slightly longer; scutal hair sparse; hair on metasoma sparse only.

Sculpture. As for female except clypeal punctures smaller when viewed using uniform illumination, $i=0.5-1d$;

longitudinal rugae on propodeal triangle less distinct but broad, scrobiculate sulcus on anterior ends of peripheral suture more distinct.

Leioproctus (*Euryglossidia*)

spinescens sp. nov.

urn:lsid:zoobank.org:act:EEC109D5-758A-4EC0-85EA-9BF3BC0E9DFB

Fig. 56

Holotype. ♂ 14 km WSW Enneabba, WA (29.870°S 115.135°E), Sep 1987, T.F. Houston, on *Scholtzia laxiflora*, WAM 12047.

Diagnosis. The spine on the hind basitarsus is not found in any other species.

Description of male. Body length 6.3 mm. Relative head measurements: HW 100; HL 84; UFW 67; LFW 48; CL 29; FL 118; SL 25.

Inner orbits strongly convergent ventrally; clypeus transversely convex; anterior face of supraclypeal area rectangular, flat; medial carina short, $ca\ 0.4 \times$ distance to median ocellus; mandible bidentate, smoothly curved; flagellum long, segments fl2–fl11 longer than wide; gena, viewed laterally, less than half as wide as compound eye; hind tibia with long, colourless spine near distal end, hind basitarsus with a long socketed spine at mid-length and two shorter socketed spines at proximal end; claws cleft.

Colouration. Black, except flagellum dark brown dorsally, yellow-brown ventrally, all basitarsi, anterior face of fore tibia and “knees” between femora and tibiae yellow-brown, apical margins of metasomal terga bronze.

Pubescence. Face, apart from upper frons and vertex,

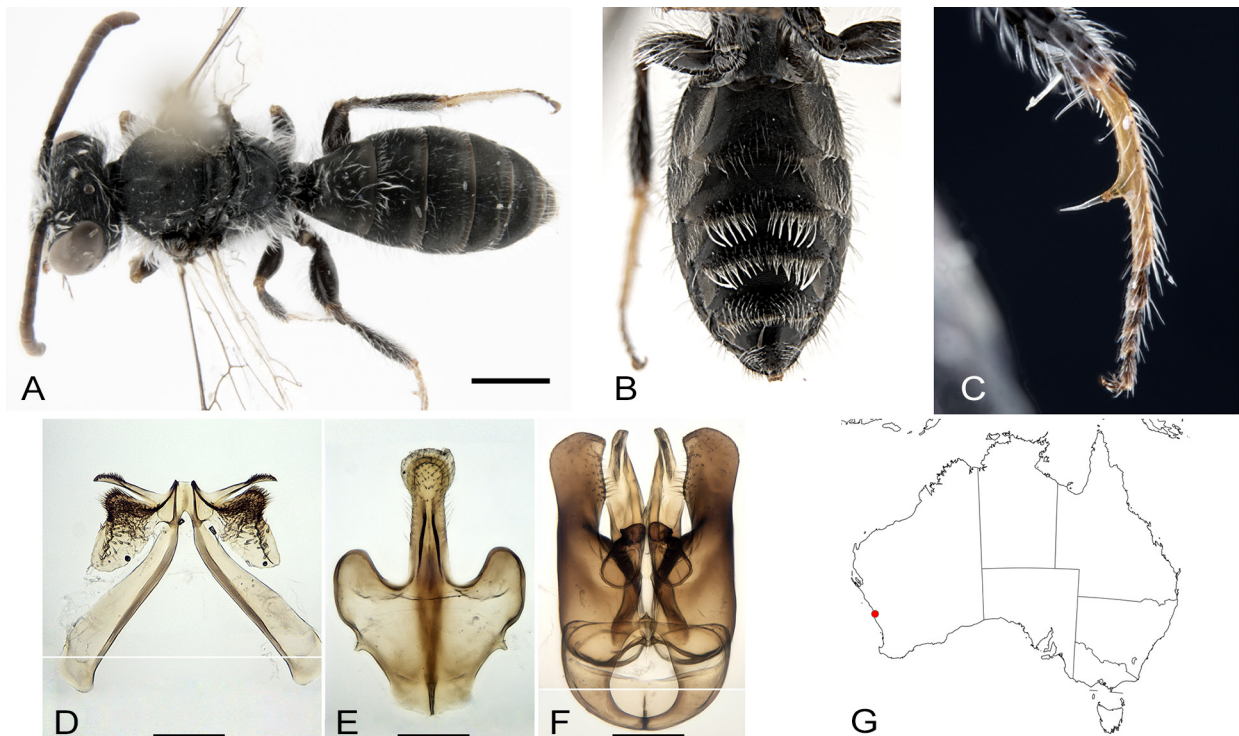


Figure 56. *Leioproctus* (*Euryglossidia*) *spinescens* sp. nov. ♂: A, dorsal view; B, metasomal sternite; C, hind basitarsus; D–F, terminalia ventral views; G, collection locations. Scale bars: A, 1 mm; D–F, 200 μm .

densely covered with white, closely-branched hair, 2×MOD, adpressed below antennal sockets, erect on lower frons; hair on scutum and scutellum sparse, white, with sparse, fine branching, 2–3×MOD; metasomal hair sparse apart from adpressed hair on ventrally facing lateral margins of T1–T3 and apical fringes on S3 & S4.

Sculpture. Lower face with small punctures, $i < d$, with polished interspaces; frons almost areolate with both small and mid-sized punctures, $i = 0.2–1d$, with strongly reticulate interspaces; scutum and scutellum strongly reticulate, obscuring small, weak punctures, $i = 3–4d$; propodeal triangle strongly reticulate with the peripheral suture indicated by a shallow, moderately wide, scrobiculate sulcus; metasoma finely reticulate.

Female. Unknown.

Etymology. The specific epithet is a Latin adjective referring to the spiny hind legs.

Leioproctus (Euryglossidia) striatulus (Rayment, 1959)

Figs 57–58

Filiglossa striatula Rayment, 1959: 326..

Filiglossa proxima Rayment, 1959: 326.

Leioproctus (Euryglossidia) striatulus—Michener, 1965: 69.

Leioproctus (Euryglossidia) proximus—Michener, 1965: 69.

Holotype. ♀ of *striatula* Patonga, NSW, 14 Sep 1947, ANIC 32 153544—missing left flagellum beyond fl3, right flagellum beyond fl1, left mid femur, tibia and tarsus, left hind tibia and tarsus.

Holotype. ♀ of *proxima* Patonga, NSW, 14 Sep 1947, ANIC 32 153549—missing right hind leg.

Other specimens examined: 4♀ 2♂, Black Sands, VIC (37.83°S 145.67°E), 16 Oct 1936, ANIC; 3♀, Pilliga NR, NSW (30.744°S 149.513°E), 18 Sep 2000, on *Grevillea floribunda*, M. Batley, AMS K.182680–82; 2♂ 1♀, 2 km N Clarence, NSW (33.457°S 150.216°E), 29 Oct 2002, M. Batley, on *Grevillea laurifolia*, AMS K.182683–85; 2♂, 2 km NE Clarence, NSW (33.461°S 150.271°E), 29 Nov 2004, M. Batley, on *Grevillea laurifolia*, K.360717,33; 2♀, 1 km NE Dargan, NSW (33.483°S 150.266°E), 1 Jan 2005, M. Batley, on *Grevillea laurifolia*, K.360754,55; 1♀, Turrumurra, NSW (33.734°S 151.128°E), 29 Aug 2005, M. Batley, on *Grevillea speciosa*, K.360556; 1♀, Clarence, NSW (33.474°S 150.226°E), 12 Nov 2005, M. Batley, on *Grevillea laurifolia*, K.221115; 12♂, Commodore Heights, NSW (33.611°S 151.274°E), 22–23 Aug 2006, M. Batley, K.359877–80, 85–92; 2♀, Black Mountain, ACT (35.274°S 149.090°E), 1 Oct 2006, on *Grevillea lanigera*, M. Batley, K.278257, 58; 1♂, 3 km E Clarence, NSW (33.478°S 150.217°E), 16 Nov 2007, M. Batley, on *Grevillea laurifolia*, K.36238; 1♀, 12 km ENE Gilgandra, NSW (31.664°S 148.774°E), 8 Oct 2008, M. Batley, on *Grevillea arenarea*, K.360815; 7♂, Marramorra NP, NSW (33.530°S 151.060°E), 16 Aug 2009, on *Grevillea laurifolia*, on *Grevillea laurifolia*, M. Batley, K.273248–54; 2♀, Cocoparra NP, NSW (34.122°S 146.235°E), 14 Sep 2011, M. Batley, on *Grevillea floribunda*,

K.361310, 11; 1♂, 10♀, 22 km NE Dubbo, NSW (32.133°S 148.777°E), 1 Oct 2012, M. Batley, on *Grevillea arenarea*, K.345426–36; 1♀, Goonoo SF, NSW (32.013°S 148.918°E), 1 Oct 2012, M. Batley, on *Grevillea floribunda*, K.345562; 3♂, Commodore Heights, NSW (33.613°S 151.289°E), 6 & 13 Aug 2019, M. Batley, on *Boronia ledifolia* & *Grevillea speciosa*, K.580991, 95, 97; 3♂, Commodore Heights, NSW (33.613°S 151.289°E), 13 & 18 Aug 2020, M. Batley, on *Grevillea speciosa*, K.581295–97.

Diagnosis. Mid-sized, head and mesosoma black, metasoma dark brown, frons striate near ocelli, scutum polished, sparsely punctate, propodeal triangle with longitudinal striae curving towards peripheral suture, distinguished from *pachygenatus* by extent of striae on propodeal triangle, from *mutabilis* by polished scutum and from female *caesicitus* by narrow face (HL~80) and longer flagellum.

Redescription of female. Body length 6.4 mm, head width 1.8 mm. Relative measurements: HW 100; HL 79; UFW 68; LFW 57; SL 30; FL 84; CL 29

Inner orbits gently convergent ventrally; clypeus convex; medial carina almost reaching medial ocellus; inner hind tibial spur with 9–13 teeth about ½ as long as width of shaft; claws with strong medial tooth.

Colouration. Head and mesosoma black, except frons weakly brassy; apical ⅓ of flagellum dull orange-brown ventrally; metasoma dark brown dorsally, a little paler ventrally; legs black or dark brown; mandible black, dark red apically; wings hyaline with a bluish iridescence.

Pubescence. Clypeus, paraocular and interantennal areas and gena with open, erect, closely branched white hair 1.5×MOD; scutum and scutellum with open, erect, openly-branched brown hair 1–2×MOD, becoming paler near margins; sides of mesosoma with open, plumose, white hair 2×MOD; hair of hind tibial scopa sparse to open, weakly branched, transparent white; prepygidial fimbria dense, pale brown; metasomal sterna S2–S4 with sparse subapical bands of mostly simple setae, S5 with dense apical fringe. 1.5×MOD.

Sculpture. Clypeal punctures of mixed size with polished interspaces, apically large, $i = d$; medially medium-sized, $i = 1–4d$; near basal suture small $i = 2–4d$; punctures on anterior face of supraclypeal area mid-sized, $i = 2–5d$; in paraocular areas and on frons mid-sized, $i < d$; frons strongly reticulate between punctures with fine irregular vertical rugae near ocelli; scutum and scutellum with small to medium, sparse punctures and polished interspaces, $i = 2–6d$ medially, $i \approx d$ peripherally; propodeal triangle reticulate with longitudinal rugae, stronger laterally and curving towards the moderately wide, scrobiculate peripheral suture; metasomal terga weakly shiny with moderate lineo-reticulation.

Description of male. Body length: 5.6 mm. Relative measurements: HW 100; HL 77; UFW 66; LFW 51; SL 26; SW 8; FL 140; CL 32 AMS K.273251.

Inner orbits ventrally convergent; clypeus convex; medial carina weak but almost reaching medial ocellus; flagellum long subgeniculate, all segments other than first longer than wide; gena little more than half as wide as compound eye viewed laterally; claws cleft.

Colouration. Head and mesosoma black, except frons weakly brassy; metasoma dark brown dorsally, a little paler ventrally; legs predominantly dark brown, with basitarsi

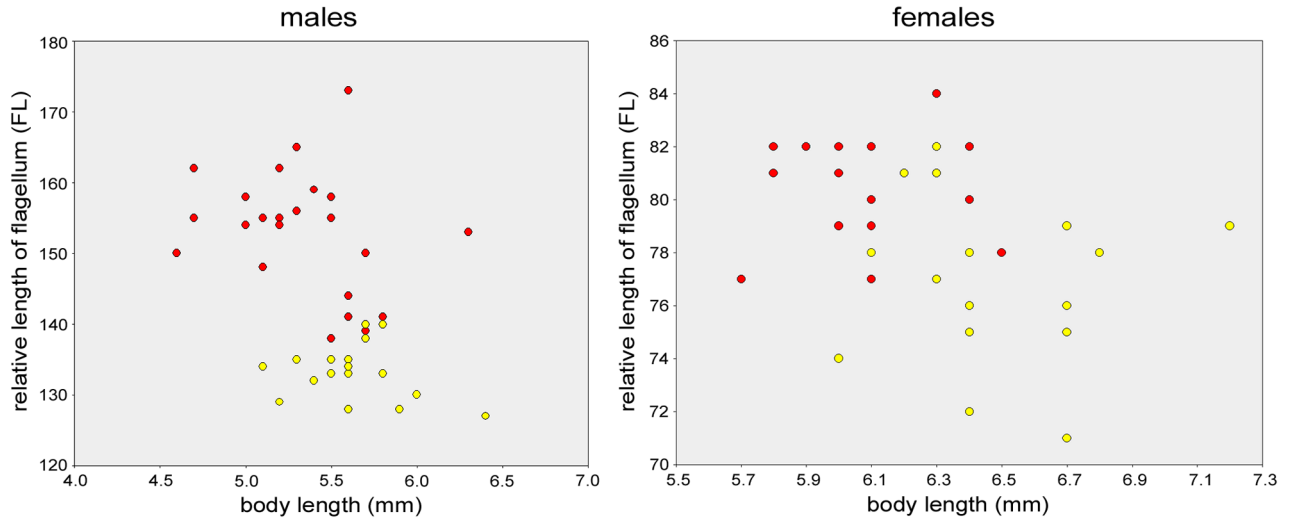


Figure 57. *Leioproctus* (*Euryglossidia*) *striatulus* relative flagellar length (FL) versus body length in mm for both sexes: form A (red dots) and form B (yellow dots).

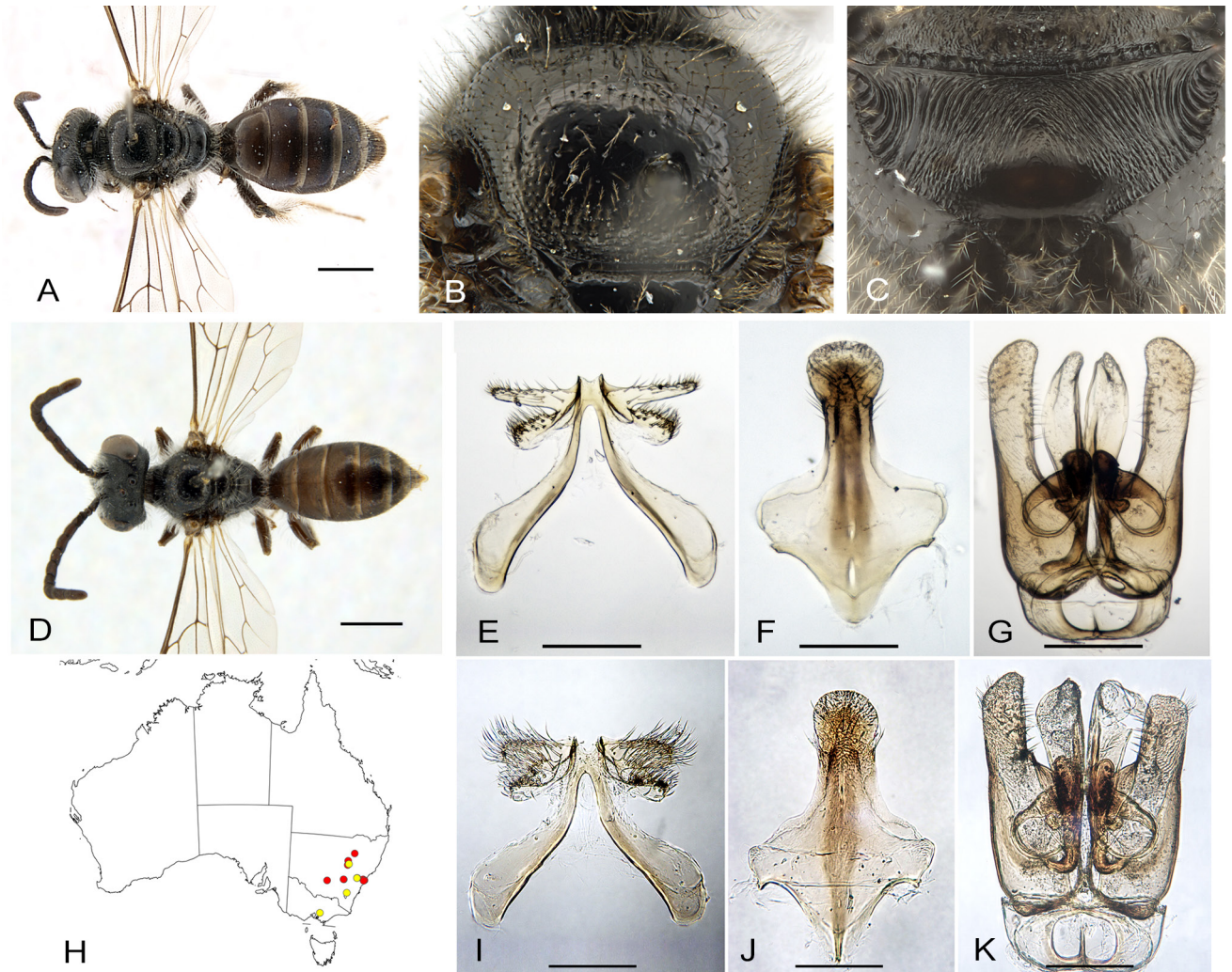


Figure 58. *Leioproctus* (*Euryglossidia*) *striatulus* (Rayment): A, ♀ dorsal view; B, ♀ scutum; C, ♀ propodeal triangle; D, ♂ dorsal view; E–G, ♂ form A terminalia ventral views; H, collection locations, red dots form A, yellow dots form B; I–K, ♂ form B terminalia. Scale bars: A, D, 1 mm; E–G, I–K, 200 µm.

yellow brown; mandibles black, dark red apically; wings hyaline with a bluish iridescence.

Pubescence. Clypeus, paraocular and interantennal areas and gena with open, erect, closely branched white hair $1.5 \times \text{MOD}$; scutum and scutellum with open, erect, openly-branched brown hair $1-2 \times \text{MOD}$, becoming paler near margins; sides of mesosoma with open, plumose, white hair $2 \times \text{MOD}$, metasomal tergal hair sparse sternal hair sparse apart from white apical fringes $2 \times \text{MOD}$ laterally, shorter medially on S4, S5.

Sculpture. Lower face polished between strong punctures, frons strongly reticulate between punctures with fine irregular vertical rugae near ocelli; scutum and scutellum polished with weak reticulation on anterolateral corners and rear margin of scutum; propodeal triangle reticulate with longitudinal rugae, stronger laterally and curving towards the moderately wide, scrobiculate peripheral suture; metasomal terga weakly shiny with moderate lineo-reticulation. Clypeal punctures of mixed size: apically large, $i=d$; medially medium-sized, $i=1-4d$; near basal suture small $i=2-4d$. Punctures on anterior face of supraclypeal area medium, $i=2-5d$; in paraocular areas and on frons medium, $i \leq d$; on scutum and scutellum, small sparse medially, $i \approx 2d$ peripherally; metasomal terga with sparse minute punctures.

Variation. There are probably two very similar species as indicated by the male terminalia. Nine males were dissected and S7 was consistently either form A (Fig. 58E) or form B (Fig. 58I) with no evidence of intermediate forms. The body length and relative length of the flagellum for specimens of both sexes collected in the same events as the dissected males were measured and plotted in Fig. 57. Males of form A have a longer flagellum than those of form B and are slightly smaller, but females of the two forms cannot be reliably separated using either measurement. Unfortunately, the holotypes of *striatulus* and *proximus* are both female so that molecular evidence will be required to determine which form corresponds with the holotype.

Leioproctus (Euryglossidia)

strigatus sp. nov.

urn:lsid:zoobank.org:act:EDC01C97-9759-4CA2-830F-C95961169C9B

Fig. 59

Holotype. ♀ Peak Charles NP, WA (32.89°S 121.18°E), 30 Sep 2005, L. Packer, AMS K.396339.

Paratypes. 6♀, same data as holotype, 1♀ in AMS K.396340, 5♀ in YUC.

Other specimens examined: 2♀ 1♂, Badgingarra NP, WA (30.365°S 115.481°E), 10 Oct 2005, L. Packer, YUC.

Diagnosis. Small, head and mesosoma black, metasoma dark brown, scutum polished, frons punctate/striate, metasomal T1 polished, remaining terga lineo-reticulate, reticulation on propodeal triangle transversely stretched basally.

Description of female. Body length *ca* 5.5 mm. Relative measurements: HW 100; HL 82; UFW 68; LFW 60; CL 27; FL 68; SL 33.

Inner orbits gently convergent ventrally; mandible bidentate, smoothly curved; clypeus gently convex medially

but strongly convex apically and laterally; supraclypeal area prominent with distinct dorsolateral and anterior faces; frontal carina extending half way to median ocellus; flagellum short, segments fl2–fl7 shorter than width; gena slightly wider than compound eye viewed laterally; inner hind tibial spur with 4–5 fine, oblique teeth almost as long as width of spur; claws simple.

Colouration. Head and mesosoma black, occasionally slightly brassy; metasoma dark brown with wide apical margins of terga bronze; legs dark brown except fore tibia and tarsus mostly orange-brown, anterior face of mid tibia orange-brown; apex of mandible dark red.

Pubescence. Hair of clypeus, paraocular area, lower frons, and gena open, white, plumose, $2 \times \text{MOD}$; mesosomal hair open, white, plumose, erect, $2 \times \text{MOD}$ dorsally, $2 \times \text{MOD}$ laterally; hair of hind tibial scopa open, white, bipectinate on anterior margin, weakly pectinate on posterior margin; metasomal hair sparse, except for brown prepygidial fimbria and subapical bands of erect, weakly-branched, white hair on S2–S4, $2 \times \text{MOD}$; S5, S6 with tightly branched apical fringes.

Sculpture. Punctures of clypeus, lower paraocular area and dorsal surfaces of supraclypeal areas mid-sized with polished interspaces, $i=1-2d$; frons with strong, mid-sized punctures, $i=0.5d$, and usually vertical rugae; punctures of scutum and scutellum small, interspaces shiny, $i=2-5d$; reticulation on basal half of propodeal triangle transversely stretched creating a strigate appearance, apical half polished with reticulation weak or absent, anterolateral corners with short, broad, scrobiculate sulci; metasomal T1 distinctly shinier than subsequent segments.

Description of male. Body length 5.0 mm. Relative measurements: HW 100; HL 82; UFW 66; LFW 58; CL 25; FL 140; SL 27.

Metasoma more slender than female; flagellum of moderate length, segments fl3–fl10 longer than wide; claws cleft.

Colouration. As for female, except all tibiae and tarsi orange-brown with some infuscation; tip of mandible amber.

Pubescence. Hair of head and mesosoma as for female, except hair of lower face longer and denser; hair on metasoma sparse, except for weak apical fringes on S4, S5.

Sculpture. As for female except reticulation slightly stronger; T1 weakly reticulate but shinier than following segments; punctures on clypeus and lower paraocular areas mid-sized, $i \leq d$.

Etymology. The specific epithet is a Latin adjective constructed from the term used to describe fine, transverse striation referring to the appearance of the propodeal triangle.

Leioproctus (Euryglossidia)

sulcatus sp. nov.

urn:lsid:zoobank.org:act:E6E90DA7-3042-44B1-A4C9-8C5AB58E1292

Fig. 60

Holotype. ♀ NW Northcliffe, WA (34.613°S 116.127°E), 9 Nov 2019, L. Packer, AMS K.396341.

Paratypes. ♀, same collection data as holotype, AMS K.396342; 9♀, same collection data as holotype, YUC; 2♀, Middleton Road, WA (34.613°S 116.141°E), 8 Nov 2019, on *Eucalyptus*, L. Packer, YUC

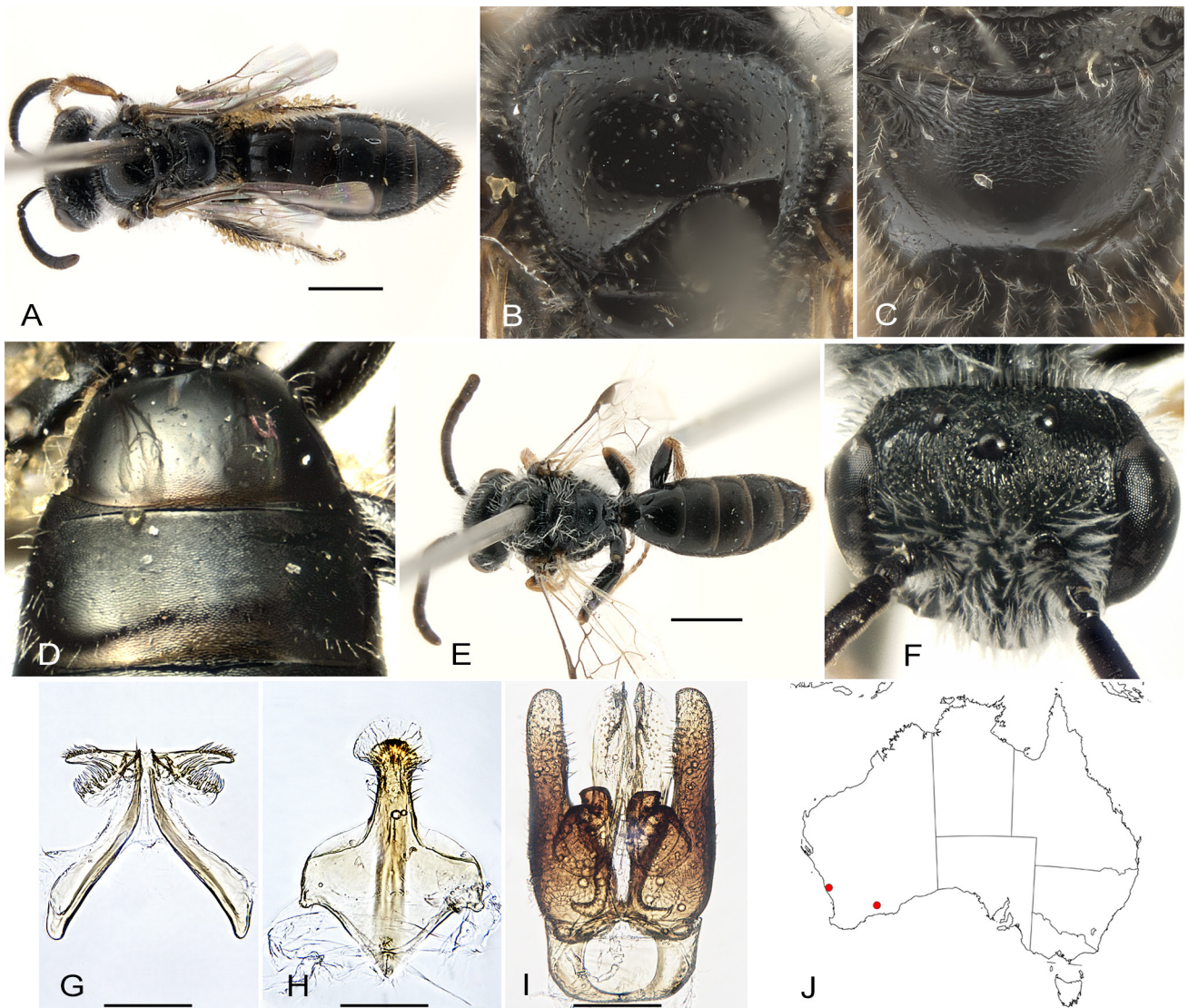


Figure 59. *Leioproctus* (*Euryglossidia*) *strigatus* sp. nov.: A, ♀ dorsal view; B, ♀ scutum; C, ♀ propodeal triangle; D, ♀ metasomal T1 & T2; E, ♂ dorsal view; F, ♂ frons; G–I, ♂ terminalia ventral views; J, collection locations. Scale bars: A, E, 1 mm; G–I, 200 µm.

Diagnosis. Large, head and mesosoma black, metasoma dark steel blue, propodeal triangle without longitudinal rugae.

Description of female. Body length *ca* 8 mm. Relative measurements: HW 100; HL 75; UFW 71; LFW 62; CL 23; FL 80; SL 35.

Inner orbits parallel; clypeus and supraclypeal area gently convex; mandible bidentate, smoothly curved; frontal carina extends over half way to median ocellus; length of flagellum moderate, segments fl1–fl7 shorter than wide; gena not as wide as compound eye viewed laterally; inner hind tibial spur with 3–5 oblique teeth less than half as long as width of spur; claws with sharp subapical tooth; pygidial plate triangular with acute apex, gently raised medially.

Colouration. Head and mesosoma black except flagellum dark brown, tegulae transparent dark brown, legs black to dark brown paler distally, mandible with dark red tip; metasoma black with a hint of steel blue, terga with brownish apical margins; prepygidial fimbria brown; wings with strong brown tint.

Pubescence. Hair of clypeus, paraocular areas, lower frons and gena sparse, white, weakly plumose *ca* 1×MOD,

interspersed on clypeus with simple setae; hair of scutum open, pale brown, tightly branched, *ca* 0.5×MOD, interspersed with longer, dark simple setae; hair of mesepisternum sparse, white, minutely branched, 1×MOD; hair of hind tibial scopa open, brown, bipectinate on anterior margin, weakly pectinate or simple on posterior margin; metasomal hair sparse dorsally except for weak, dark brown prepygidial fimbria; hair on apical 1/3 of metasomal sterna S2–S5 dull white, open, plumose, 2×MOD; apical fringes of S5, S6 dense, 2×MOD.

Sculpture. Punctures on clypeus large, irregular, $i < d$ with weakly reticulate interspaces; supraclypeal area weakly reticulate, medially impunctate; lateral margins of supraclypeal area, lower paraocular areas and frons with weak, small to mid-sized punctures, $i = 1-2d$, with strongly reticulate interspaces; scutum strongly reticulate obscuring small punctures, $i \approx 2d$; scutellum strongly punctate, $i < d$; propodeal triangle reticulate with deep wide scrobiculate sulci in anterolateral corners, and short longitudinal rugae adjacent to sulci; metasoma weakly reticulate but shiny, largely impunctate.

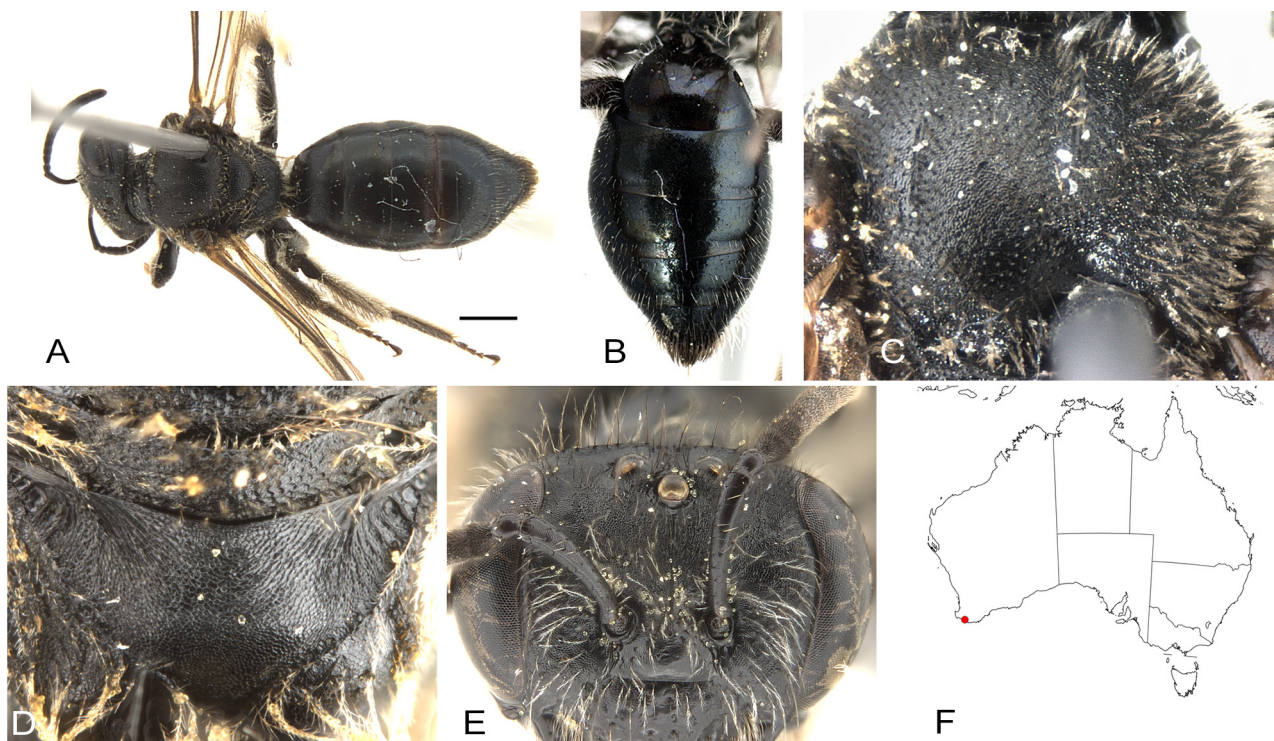


Figure 60. *Leioproctus (Euryglossidia) sulcatus* sp. nov. ♀: A, dorsal view; B, metasoma; C, scutum; D, propodeal triangle; E, frons; F, collection locations. Scale bar: 1 mm.

Male. Unknown.

Etymology. The specific epithet is a Latin adjective referring to the depressions in the anterior corners of the propodeal triangle.

Leioproctus (Euryglossidia) viridescens (Cockerell, 1929)

Fig. 61

Euryglossidia viridescens Cockerell, 1929: 216.

Leioproctus (Euryglossidia) viridescens—Michener, 1965: 69.

Holotype ♀, Geraldton, WA, 4 Sep 1926, Nicholson, AMS K.95565; **Paratype** ♀, as for holotype, AMS K.95566. The holotype bears a label in Cockerell's hand saying *Euryglossidia viridescens* Ckll TYPE and the paratype a similar label saying *Euryglossidia viridescens* Ckll cotype.

Other specimens examined: 20♀ 4♂, 13 km S Wannoo, WA (26.930°S 114.66°E), 29–31 Jul 1985, T.F. Houston, on *Hakea*, WAM 11220–11239, 20719–22; 5♂ 13 km S Wannoo, WA (26.930°S 114.625°E), 1 & 21 Aug 1985, T.F. Houston, on *Hakea* & *Thryptomene*, WAM 19903–07; 2♂ East Yuna NR, WA (28.419°S 115.203°E), 28 Aug 1984, T.F. Houston & B. Hanich, on *Thryptomene strongylophylla*, WAM 19908, 9; 4♂ 13 mi N Geraldton, WA (28.60°S 114.63°E), T.F. Houston, SAM 44793, 94; 7♀, Arrowsmith River, WA (29.60°S 115.12°E), 11 Sep 1981, G.A. Holloway, AMS K.396343–49.

Diagnosis. Small, head and mesosoma black, metasomal T1 & T2 usually yellow-brown with darker mottling, remainder

dark brown (female) or dark brown with T4 & T5 almost black (male), female frons with a few irregular striae, male flagellum *ca* twice as long as head width.

Redescription of female. Body length 6.5 mm. Relative head measurements: HW 100; HL 79; UFW 68; LFW 60; CL 25; FL 80; SL 32.

Clypeus gently convex, flagellum mid-length, fl4–fl9 about as long as wide; frontal carina extending halfway to median ocellus; first abscissa of posterior margin of second submarginal cell of forewing shorter than first submarginal crossvein; inner hind tibial spur with 4–6 teeth a little longer than width of spur; claws with small sharp medial tooth.

Colouration. Head and mesosoma black, except mandible dark reddish apically, flagellum dark brown dorsally, yellow-brown ventrally, tegula transparent yellow-brown and legs dark brown with yellow-brown infusions on distal ends of femora and anterior faces of tibiae; anterior half of metasomal T1 dark brown, posterior half of T1, and most of T2, T3 yellow with apical margin dark brown, T2 with large oval dark brown areas laterally, remaining terga dark brown to black.

Pubescence. Hair on clypeus and paraocular areas open, white, closely branched, 1×MOD on clypeus and 2×MOD in paraocular areas, gena with similar erect hair 1–2×MOD; scutum with open cover of pale golden brown, tightly-branched hair 0.5–1×MOD sparsely interspersed with long simple setae 2×MOD; mesosoma laterally with white, erect, plumose hair, *ca* 1.5×MOD; hair of hind tibial scopa open, translucent, pectinate, 1–2×MOD, with bipectinate setae on anterior margin, some simple setae near basitibial plate; hair on metasomal terga sparse apart from golden brown prepygidial fimbria; sterna with narrow rows of erect, open, white, plumose hairs, 1–2×MOD, S5 with a dense apical fringe.

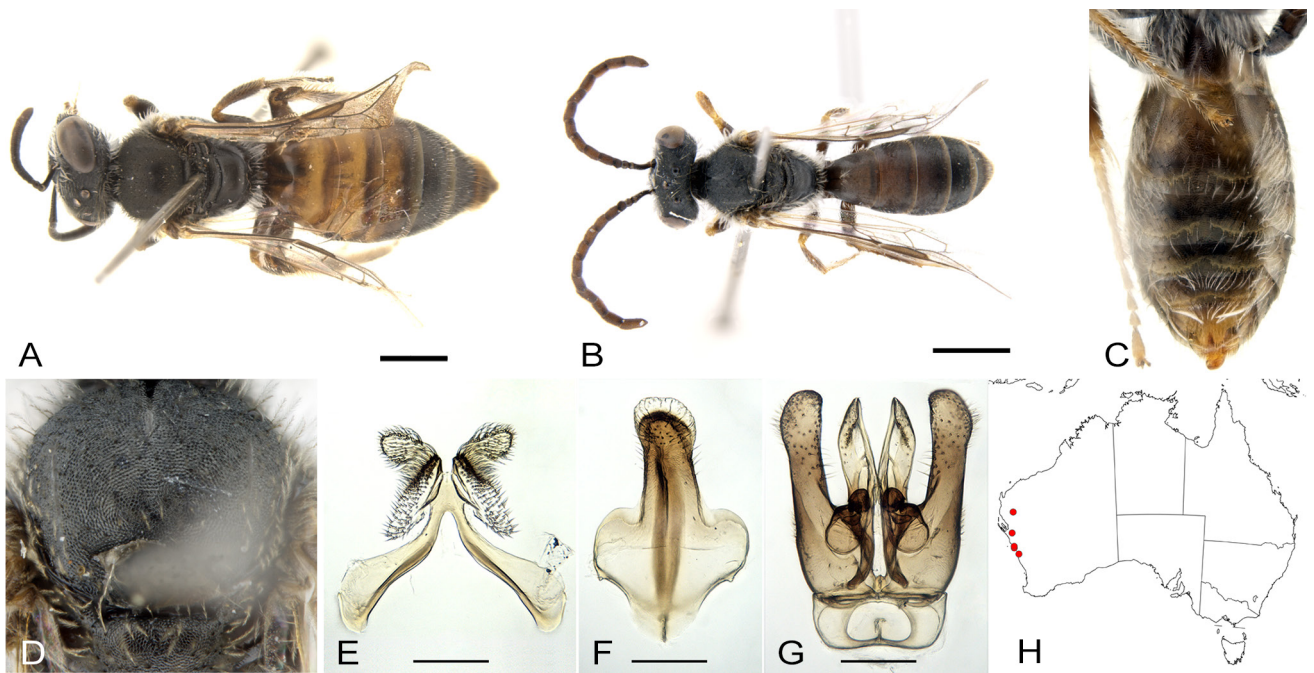


Figure 61. *Leioproctus* (*Euryglossidia*) *viridescens* (Cockerell): A, ♀ dorsal view; B, ♂ dorsal view; C, ♂ metasomal sterna; D, ♂ scutum; E–G, ♂ terminalia ventral views; H, collection locations. Scale bars: A, B, 1 mm; E–G, 200 µm.

Sculpture. Lower face polished between strong punctures, except supraclypeal area weakly reticulate, upper face, scutum, metanotum and propodeal triangle strongly reticulate, scutellum weakly reticulate and shiny, metasoma with moderately strong reticulation. Peripheral suture of propodeal triangle without distinct sulcus other than a broad, short region with indistinct scrobiculae at anterior ends. Clypeal punctures large, almost contiguous on apical half, with interspaces increasing toward base where $i \approx d$; paraocular areas and frons with medium punctures, $i \approx d$; punctures on scutum obscured by reticulation except those bearing longer simple setae; scutellum with sparse punctures only; metasomal terga with few punctures except near prepygidial fimbria.

Variation. In females, the colour of the first two metasomal segments varies from yellow-brown to almost black.

Description of male. Body length 5.7 mm. Relative head measurements: HW 100; HL 78; UFW 69; LFW 52; CL 26; FL 190; SL 27.

Clypeus and supraclypeal area gently convex; flagellum long, segments fl3–fl10 weakly geniculate, less than twice as long as wide; mid-facial carina extends less than halfway to median ocellus; first abscissa of posterior margin of second submarginal cell of forewing shorter than first submarginal crossvein, claws cleft.

Colouration. Head and mesosoma black except mandible with short preapical region amber, flagellum dark brown dorsally, yellow-brown ventrally; legs dark brown proximally, with mid and hind tarsi and fore tibia and tarsus yellow-brown with a few darker marks; metasoma dark brown with T4 and T5 almost black, sterna paler with yellow-brown suffusion particularly on S2 and S6.

Pubescence. Clypeus with sparse white, weakly branched hair, $2 \times \text{MOD}$; lower paraocular areas and gena with close, plumose, white hair, $2 \times \text{MOD}$, shorter on gena; hair on scutum open, pale brown, weakly branched, $1.5 \times \text{MOD}$; mesepisternum with open, plumose, white hair, $ca 1 \times \text{MOD}$; hair on metasoma sparse apart from weak apical fringes on

S4 & S5.

Sculpture. Clypeus and supraclypeal area shiny with small punctures, $i = d$, and weakly reticulate interspaces; frons dull with strong reticulation obscuring any punctures; scutum and scutellum with strongly reticulate interspaces; propodeal triangle more coarsely reticulate without rugae, peripheral suture with moderately narrow scrobiculate sulci along anterior half; metasomal terga lineo-reticulate and dull.

Floral records. *Hakea*, *Scholtzia*, *Thryptomene*.

Leioproctus (*Euryglossidia*) *vitrifrons* (Smith, 1879)

Fig. 62

Dasycolletes vitrifrons Smith, 1879: 11.

Euryglossidia eraduensis Cockerell, 1929: 217. **new synonymy.**

Leioproctus (*Euryglossidia*) *vitrifrons* (Smith)—Michener, 1965: 69.

Leioproctus (*Euryglossidia*) *eraduensis* (Cockerell)—Michener, 1965: 68.

Holotype. ♂ of *vitrifrons*, Swan River, WA, NHM Hym.17.a.523— examined using Portal images and specifically requested images provided by NHM.

Holotype. ♀ of *eraduensis*, Eradu, WA, 8 Sep 2006, Nicholson, AMS K.95564.

Other specimens examined: 1 ♀, Clackline, WA (31.719°S 116.519°E), 28 Sep 1979, D. Fox-Grey, on *Chamelaucium uncinatum*, WAM10684; 1 ♀ 1 ♂, Beverley, WA (32.11°S 116.93°E), F.H. du Boulay, SAM 32-44782, 83; 3 ♀, Kelmscott, WA (32.11°S 116.01°E), 16–17 Oct 1958, J. Baldwin, SAM 32-802, 810, 811; 2 ♂ 6 ♀, 6 km E Merriden, WA (31.480°S 118.330°E), 23 Sep 2005, L. Packer, YUC.

Diagnosis. Large, weakly iridescent, male with depressed ocellular areas, female mesosoma laterally iridescent blue, male tibiae and tarsi orange, female legs dark brown, males distinguished from *clivifrons*, *criniventris* and *cristativentris* by paired hair tufts on metasomal S3 & S4 and from *chrysopsis* by the length and density of the hair tufts, females distinguished from *macalpinei* by larger size, striate frons and open punctures medially on clypeus, from *clivifrons* by metasomal colour and from *chrysopsis* by smaller size and longer branches on hair of posterior half of hind tibial scopa.

Redescription of male. Body length 8.3 mm. Relative head dimensions: HW 100; HL 75; UFW 66; LFW 54; CL 29; FL 160; SL 27.

Inner orbits strongly convergent ventrally; clypeus convex longitudinally and transversely; frons and ocellular area strongly depressed; flagellum long, segments fl2–fl7 more than 1.5 times as long as wide; gena more than half as wide as compound eye viewed laterally; mid basitarsus not expanded; hind tarsus longer than hind tibia, with relative length of tarsal segments 100:30:19:12:24; claws cleft; metasomal sterna elevated medially (boat-shaped).

Colouration. Face, mesosoma, and metasoma black with brassy sheen, T6 variable, frequently brown; all tibiae and tarsi orange-brown with some darker suffusions; flagellum dark brown; wings tinted brown.

Pubescence. Clypeus closely covered with long, adpressed silver hair, $2\times\text{MOD}$; gena ventrally with a beard of white hair; metasomal sterna S3, S4 with tufts of erect white hair either side of midline. Other hair on the three specimens available sparse, but some long hair may have been present on scutum and metasomal T1.

Sculpture. Clypeus with small punctures, $i=1-2d$, with reticulate interspaces; front surface of supraclypeal area impunctate, reticulate; frons striate with strong reticulation

obscuring small punctures; scutum strongly reticulate with pits running together in places to form wavy lines; scutellum with small punctures, $i=1-2d$, and reticulate interspaces; propodeal triangle more coarsely reticulate, peripheral suture with an indistinct, very broad, shallow, scrobiculate sulcus along anterior $\frac{1}{3}$; metasomal terga lineo-reticulate.

Description of female. Body length 9.0 mm HW 100; HL 77; UFW 69; LFW 60; CL 28; FL 78; SL 38.

Inner orbits weakly convergent ventrally; mandible bidentate, smoothly curved; clypeus convex; flagellum of moderate length, segments fl2–fl7 approximately as long as wide; gena more than half as wide as compound eye viewed laterally; scutellum weakly bigibbous; inner hind tibial spur with 3–4 coarse, widely-spaced teeth longer than width of spur; claws with large basal tooth.

Colouration. Iridescent blue-green, brassy in parts, except clypeus black, flagellum ventrally and all legs dark brown, tegulae transparent dark brown, wings tinted brown.

Pubescence. Clypeal hair sparse, white, simple or weakly branched, $2\times\text{MOD}$ interspersed with longer, brownish, simple setae; hair of lower paraocular and interantennal areas close, plumose, $2\times\text{MOD}$; hair on scutum open, pale brown, finely-branched, $1\times\text{MOD}$, interspersed with dark simple setae, $ca\ 2\times\text{MOD}$; lateral hair of mesosoma is longer, $2-3\times\text{MOD}$, white, plumose becoming simple and shorter on the venter; hair of hind tibial scopa close, white bipectinate with crinkled tips on anterior margin, dark brown, pectinate medially and pale, weakly pectinate on posterior margin; metasomal terga with scattered, short, simple setae apart from the dark brown prepygidial fimbria; hair of apical half of metasomal sterna S2–S5 close, weakly branched, white, $ca\ 3\times\text{MOD}$; apical fringes of S5, S6 dense, $1.5\times\text{MOD}$.

Sculpture. Clypeal punctures strong, medially medium sized, $i=0.5-2d$ with weakly reticulate interspaces, latero-

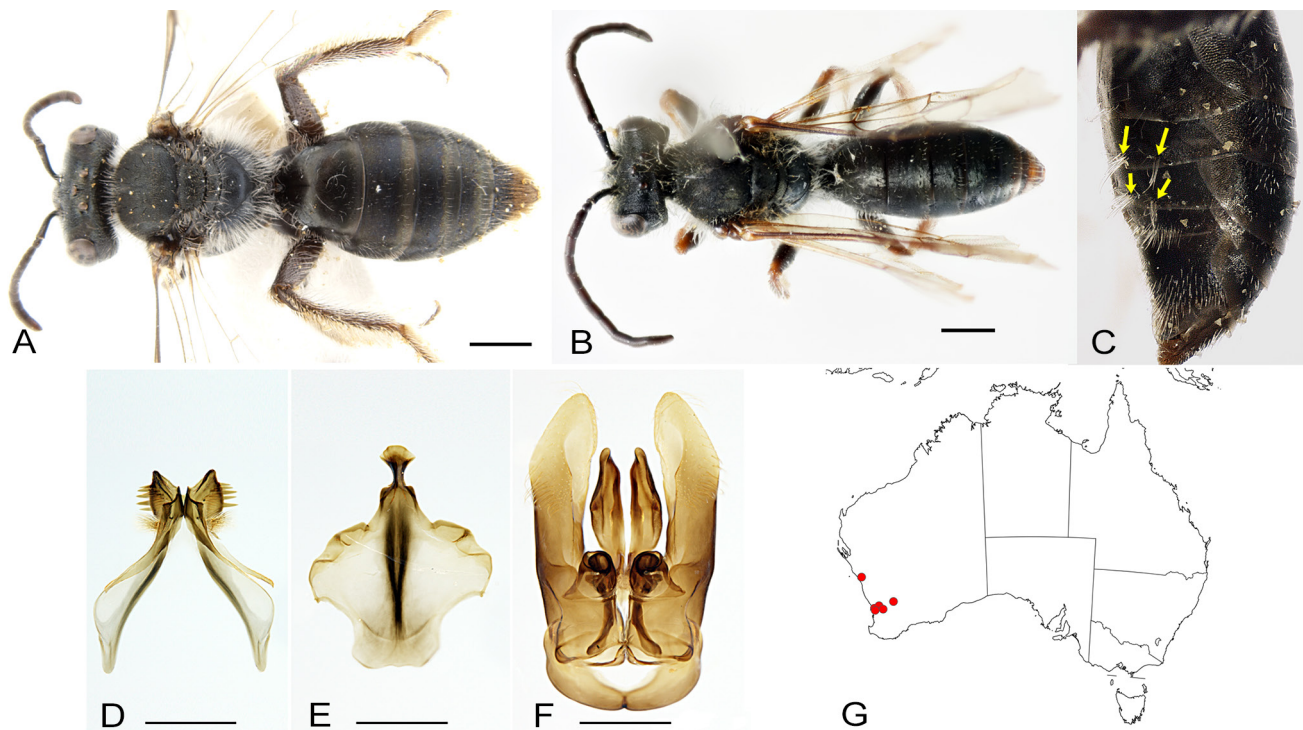


Figure 62. *Leioproctus (Euryglossidia) vitrifrons* (Smith): A, ♀ dorsal view; B, ♂ dorsal view; C, ♂ metasomal sterna, arrows indicate hair tufts; D–F, ♂ terminalia ventral views; G, collection locations. Scale bars: A, B, 1 mm; D–F, 500 μm .

ventrally small, almost contiguous; front surface of supraclypeal area impunctate, weakly reticulate; punctures of lower paraocular areas dense, $i < d$; frons as for male; scutum and scutellum strongly reticulate; propodeal triangle as for male.

Reclassification from *Euryglossidia* to *Colletellus*

Leioproctus (*Colletellus*) *rejectus* (Cockerell, 1905) status nov.

Euryglossa rejecta Cockerell, 1905: 476.

Leioproctus (*Euryglossidia*) *rejectus*—Michener, 1965.

Leioproctus (*Colletellus*) *claviger*, Leijs, 2018 in Leijs, Dorey & Hogendoorn: 138. **new synonymy.**

Type. ♂ Perth, WA (H.W.J. Turner) BMNH Hym.17.a.269

Comment. It was with “some reluctance” that Michener placed the male holotype of this species in *L.* (*Euryglossidia*) because the metasoma is missing. The wings, however, are intact and it is possible to see that the jugal lobe of the hind wing reaches cu-v, which is one of the criteria for placement in *L.* (*Colletellus*). This characteristic can be deduced from one of the images in the NHM Portal (<https://data.nhm.ac.uk/media/d3fe84a8-641e-4911-8448-c9b97e6c59e4>) and Dr Joseph Monks was kind enough to confirm it by direct observation.

Furthermore, ANIC has a series of specimens (1 ♀ 13 ♂) from Bolgart, WA, with the female and two males labelled “*Euryglossa rejecta* Kll” in what is believed to be Rayment’s hand. The males agreed with all the features that can be seen in the NHM Portal images of *Euryglossa rejecta*, especially the head shape, nature and distribution of the facial pubescence and with the description of the metasoma given in the original description. One of the males from the ANIC series was dissected and the terminalia were identical to those illustrated for *L.* (*Colletellus*) *claviger* in Leijs et al. (2018). As the species has been recently redescribed (Leijs et al., 2018) no new detailed description is required.

Acknowledgements. The author is very grateful to Dr Joseph Monks of the Natural History Museum, London for locating and examining several type specimens and to the digitisers, Larissa Welton, Skye Neal, and Glory Turnbull, in the Digital, Data & Informatics section of the same institution for providing high resolution images on request. Also warmly thanked for providing facilities and specimens on loan are Nikolai Tatarnic, Brian Hanich, Terry Houston (WAM), Juanita Rodriguez, Olivia Evangelista, Jaime Florez and Bonnie Koopmans (ANIC), Ben Parslow and Remko Leijs (SAM), with special thanks to Laurence Packer (YUC) for the loan of specimens from the York University collection. Terry Houston, Remko Leijs and Ken Walker are thanked for very helpful suggestions for improving the manuscript.

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