

Taxonomic revision of the Australian native bee subgenus *Australictus* (Hymenoptera: Halictidae: Halictini: genus *Lasioglossum*) – “Wood-Splitting Axe Bees”

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Abstract

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The Australian *Lasioglossum* Curtis 1833 subgenus *Australictus* Michener 1965 is revised.

Of the 11 available names listed by Michener (1965) for the subgenus *Australictus*, six are placed in synonymy. A species placed by Michener (1965) in the *Lasioglossum* subgenus *Parasphecodes* Smith 1853 is recombined to the subgenus *Australictus*, and four other species, placed in *Parasphecodes* by Michener (1965), are synonymised with this valid, recombined taxon, and the species name of the taxon is reverted to its original spelling. In addition, a species placed in *Australictus* by Michener (1965) is synonymised with a valid species in the *Lasioglossum* subgenus *Chilalictus* Michener 1965. These changes provide five valid names for the subgenus *Australictus*.

New synonymies, recombined names and valid species proposed for *Lasioglossum* (*Australictus*) are as follows: New synonymies – *Lasioglossum* (*Australictus*) *kurandense* (Cockerell 1914) **syn. nov.**, *Lasioglossum* (*Australictus*) *nigroscopaceum* (Friese 1917) **syn.** by Cockerell 1929 but listed by Michener (1965: 165) as valid = *Lasioglossum* (*Australictus*) *davide* (Cockerell 1910a); *Lasioglossum* (*Australictus*) *insculptum* (Cockerell 1918) **syn. nov.**, *Lasioglossum* (*Australictus*) *rufitarsum* (Rayment 1929) **syn. nov.** and *Lasioglossum* (*Australictus*) *fulvofasciae* Michener 1965 **syn. nov.** = *Lasioglossum* (*Australictus*) *tertium* (Dalla Torre 1896); *Lasioglossum* (*Australictus*) *franki* (Friese 1924) **syn. nov.** = *Lasioglossum* (*Chilalictus*) *orbatum* (Smith 1853). New combination and new synonymies – *Lasioglossum* (*Parasphecodes*) *lithuscum* (Smith 1853) **comb. nov.** moved to *Lasioglossum* (*Australictus*) *lithusca*; *Lasioglossum* (*Parasphecodes*) *adelaidae* (Cockerell 1905) **syn. nov.**, *Lasioglossum* (*Parasphecodes*) *griseipenne* (Cockerell 1929) **syn. nov.**, *Lasioglossum* (*Parasphecodes*) *stuchilum* (Smith 1853) **syn. nov.**, *Lasioglossum* (*Parasphecodes*) *wellingstoni* (Cockerell 1914) **syn. nov.** = *Lasioglossum* (*Australictus*) *lithusca*. Valid is *Lasioglossum* (*Australictus*) *plorator* (Cockerell 1910b).

New female subgeneric mandibular characters are added to Michener’s (1965) diagnostics for *Australictus* – mandible with elongated and enlarged preapical tooth, reduction in width of basal tooth at apical end and in dorsal view, broadening of width at base of mandible. The mandibular modifications, widening of the head basally and enlarged gena are associated with *Australictus* behaviour to nest in wood rather than ground nesting in soil as is usual for Halictidae bees. The shape of the female mandible, especially in dorsal view, resembles a wood-splitting axe – hence the common name coined here, “Wood-Splitting Axe Bees”. *Australictus* is the first record of wood-nesting bees for Australian Halictidae.

All valid species are redescribed; keys to both sexes, montage diagnostic images and distribution maps are provided to assist with species identification.

Keywords

Hymenoptera, Halictidae, Halictini, *Lasioglossum*, *Parasphecodes*, *Chilalictus*, *Australictus*, nesting behaviour.

Introduction

The world’s bee fauna consists of seven families, Apidae, Colletidae, Halictidae, Megachilidae, Stenotritidae, Andrenidae and Melittidae, with the latter two families absent from Australia. Halictidae is the second largest bee family in the world, with 4,510 species (Ascher and Pickering, 2022), and is found on all continents except Antarctica (Michener, 2007). Most of this

species richness is concentrated in the tribe Halictini, with 2,882 species (Ascher and Pickering, 2022).

Lasioglossum Curtis 1833 is one of the most species-rich and taxonomically challenging groups of all world bee genera, with 2,645 named species to date (Ascher and Pickering, 2022). *Lasioglossum* bees are distinguished from other Halictini genera by having the third submarginal (2rs-m) (“strong-veined *Lasioglossum* series”) and sometimes the second submarginal

cross veins (1rs-m) (“weak-veined Hemihalictus series”) weaker than the first submarginal cross vein (Michener 2007, see especially figs. 66–6a and c).

The Australian component of this most diverse genus within the Halictidae has 308 available names (ABRS, 2022a; note: update to ABRS, 2022a includes changes for *Callalictus* Michener 1965 – see Walker (2022); and here, *Homalictus* Cockerell 1919 is treated as a subgenus of *Lasioglossum* – see Danforth, 1999, Danforth et al., 2001, 2003, 2008; Gibbs et al., 2012, 2013; Zhang et al., 2022). In Australia, *Lasioglossum* is divided into nine subgenera as follows: *Australictus* Michener 1965 (11 species); *Austrevylaeus* Michener 1965 (six species); *Callalictus* (three species); *Chilalictus* Michener 1965 (139 species); *Ctenonomia* Cameron 1903 (nine species); *Glossalictus* Michener 1965 (one species); *Homalictus* (46 species); *Parasphecodes* Smith 1853 (92 species); and *Pseudochilalictus* Michener 1965 (one species).

The subgenus *Australictus*, with 11 available names, is a striking *Lasioglossum* subgenus of the Australian bee fauna. The subgenus occurs from north Queensland (two species), down coastal New South Wales, across Victoria, widely in Tasmania (two species), and there are three specimen records from south-east South Australia (figs. 12A–E). Bees of this subgenus nest in wood, either excavating their own nests or modifying the vacated burrows of beetles. This is the first record of wood-nesting Halictidae in Australia. To accommodate this wood-nesting behaviour, the mandibles of females have been modified as described below.

A full morphological diagnosis for the subgenus *Australictus* is provided. Species can be generally distinguished from other Australian *Lasioglossum* subgenera by the following characters: body length moderately large (females: 8.32 mm to 10.23 mm; males: 8.01 mm to 10.21 mm); female head widened basally in frontal view, with lower inner eye width almost equal to or wider than upper inner eye width (fig. 1A); bidentate mandible of females with elongated and enlarged preapical tooth (fig. 1C) and broadened at base (fig. 1E); female labrum medium process truncate apically with lateral margins pectinate (fig. 2A); dorsolateral angles of pronotum rounded (figs. 5A, 6A, 7A, 8A, 9A); body colour black, one species with metasoma red-brown (figs. 6A, 6B); several species with no body tomentum (figs. 5A–D, 6A–D, 8A–D), several species with various combinations of yellow/white tomentum on dorsolateral angles of pronotum, mesoscutum, metanotum and basal band across metasomal T2–T3 (figs. 7A–D, 9A–D); female anterior metatibial spur finely serrate (fig. 2B); and male genitalia with gonobase either basally widened (figs. 10A, 10B, 11C, 11D) or narrowed (figs. 10C–F, 12A, 12B), retrorse lobe either short (figs. 11A, 11C) or elongate (figs. 10A, 10C, 10E) and gonostylus either short (figs. 10A, 10C, 11A) or absent (figs. 10E, 11C).

The shape of the female mandible, especially in dorsal view, is broad basally and apically pointed (fig. 1E), resembling a wood-splitting axe – hence the common name suggested here, “Wood-Splitting Axe Bees”.

The Australian *Lasioglossum* subgenus *Australictus* is revised. Of the 11 available names listed by Michener (1965) for the subgenus, six are placed in synonymy. A species placed by

Michener (1965) in the *Lasioglossum* subgenus *Parasphecodes* is recombined to the subgenus *Australictus* and four other species, placed in *Parasphecodes* by Michener (1965), are synonymised with this valid, recombined taxon, and the species name of the taxon is reverted to its original spelling. In addition, a species placed in *Australictus* by Michener (1965) is synonymised with a valid species in the *Lasioglossum* subgenus *Chilalictus* Michener 1965. These changes provide five valid names for the subgenus *Australictus*.

All valid species are redescribed, keys to both sexes, montage images and distribution maps are provided to assist with species identifications.

Material and methods

Terminology follows Michener (2007), except the propodeum is called the metapostnotum (Brothers, 1976; Gibbs et al., 2013; Gibbs et al., 2022; Engel and Gonzalez, 2022) and the inner hind tibial spur is called the anterior metatibial spur (Aguar and Gibson, 2010). To assist with the descriptions, the following notes are provided: relative head measurements were standardised to a head width of 100 units; absolute measurements are expressed as minimum–mean–maximum if multiple specimens were available; body length was measured from antennal sockets to end of metasoma; forewing length was measured from the base of the arcuate basal vein (vein M) to the distal margin of the third submarginal cell (vein 2rs-m); and, intertegular distance was measured as the greatest width between the tegulae. Sculpture nomenclature follows Harris (1979). Mesoscutum punctuation nomenclature is as follows: dense, interspaces between punctures less than diameter of a puncture; close, interspaces between punctures equal to diameter of puncture; open, interspaces between punctures greater than 1 × but less than 2 × diameter of puncture; sparse, interspaces between punctures equal to or greater than 2 × diameter of puncture. To standardise the description of the mesoscutum punctuation, the mesoscutum was subdivided into areas as follows: anteromesial, area along the leading edge of the mesoscutum and on each side of the midline; anterolateral, area on the anterior lateral corners of the mesoscutum; mesial, area between parapsidal lines; parapsidal, areas between parapsidal line and nearest lateral margin; laterad of parapsidal lines, area adjacent to outer margin of the parapsidal lines; mesiad of parapsidal lines, area adjacent to the inner margin of the parapsidal lines; posterior, area along the posterior margin of the mesoscutum (see diagram in Walker, 1995: 258, fig. 3).

Due to the importance of vestiture as diagnostic characters on the male *Lasioglossum* genital capsule, in particular on the gonocoxa, retrorse lobe and gonostylus, a decision was made to photograph dry mounted capsules rather than the usual method of photography in glycerol. Treatment of the genital capsule was as usual: specimen placed in humid chamber for 24 hours, removal of genital capsule from the bee using a hooked no. 3 entomological pin (38 mm x 0.53 mm), 24 hours in 10% KOH cold, several water washes, then placed on tissue paper and allowed to dry for several hours. A micro-headless pin B3 (0.193 mm x 15 mm) was pinned to a piece of foam

attached to a no. 3 entomological pin so that the blunt end of the micropin was pointing out. A droplet of water-soluble glue was placed on the end of the micropin, one side of the micropin was scraped to reduce the amount of glue, and the blunt end was brought in contact with the left side basal corner of the gonobase and the genitalia allowed to dry. While drying, it is important to keep the glued genital capsule at the tip of the micropin. To achieve this dried position, the micropin must be held in a horizontal position with the genital capsule underneath its tip. If not placed in this drying position, the genital capsule can move down or around the micropin, obscuring the gonobase for photography. Ventral and dorsal montage images were taken against a black background to highlight diagnostic vestiture and structures. Following photography, each pinned capsule was attached to the specimen's pin pith. A decision was made to exclude images of the seventh and eighth metasomal sternal segments. These two sterna were similar in shape across all species and offered no unique diagnostic characters.

Photographs were taken using a Leica M205C microscope with a Leica DFC500 c-mount camera using LAS Version 3.8 to create image montage stacks and montaged images. Images were then post-processed and image plates formed in Adobe Photoshop 6.

Abbreviations used in the text are as follows: AOD, antennocular distance; AF, antennal flagellomeres; CL, clypeal length; EW, eye width, in side view; FL, flagellum length; GW, gena width, in side view; HL, head length; HW, head width; IAD, interantennal distance; IOD, interocellar distance; LID, lower interorbital distance; OAD, ocellantennal distance; OOD, ocellocular distance; SE – South East; SW – scutum width; S1–S5, metasomal sterna 1–5; SL, scape length; SW, scutum width; T1–T6, metasomal terga 1–6; UID, upper interorbital distance.

This study was based on examination of just over 1,000 specimens (and several citizen science images posted on Facebook – links within species descriptions) from the following collections.

AM – Australian Museum, Sydney, New South Wales; ANIC – Australian National Insect Collection, CSIRO, Canberra, Australian Capital Territory; BDBSA – Department for Environment and Water, SA Fauna, Adelaide, South Australia; BMNH – Natural History Museum, London, United Kingdom; Cornell – Cornell University, Ithaca, New York; NMV – Museums Victoria (formerly the National Museum of Victoria), Melbourne, Victoria; QDPI – Queensland Department of Primary Industries, Brisbane, Queensland; OAI – Orange Agricultural Institute, Orange, New South Wales; QM – Queensland Museum, Brisbane, Queensland; SEM – Snow Entomological Museum, Kansas University Biodiversity Institute, University of Kansas, Kansas, United States of America; TMAG – Tasmanian Museum and Art Gallery Invertebrate Collection, Hobart, Tasmania; TDA – Tasmanian Department of Agriculture, Hobart, Tasmania; WAM – Western Australian Museum, Perth, Western Australia.

Keys to both sexes of *Lasioglossum* (*Australictus*) species

- 1 Metasoma with yellow/white basal tomentum bands on T2–T3 (figs. female: 7A, 9A; male: 7C, 9C) 2

- Metasoma without tomentum bands on terga (figs. female: 5A, 6A, 8A; male: 5C, 6C, 8C) 3
- 2 Female with yellow/white tomentum on posterolateral corners of mesoscutum and on metanotum (fig. 7A); male with an apical V-patch of tomentum on posterior vertical posterior surface of metapostnotum (figs. 2C, 7C) *L. peraustrale* (Cockerell, 1904)
- Female without yellow/white tomentum on mesoscutum or metanotum (fig. 9A); male without apical V-patch of tomentum on posterior vertical posterior surface of metapostnotum (fig. 9C) *L. tertium* (Dalla Torre, 1896)
- 3 Metasoma red-brown (figs. female: 6A; male: 6C) *L. lithusca* (Smith, 1853)
- Metasoma black (figs. female: 5A, 8A; male: 5C, 8C) 4
- 4 Dorsal surface of metapostnotum posterior rim defined by raised carina, dorsal sculpture ruguloso-striolate (figs. female: 2E, 5A; male: 5C) *L. davide* (Cockerell, 1910a)
- Dorsal surface of metapostnotum posterior rim not defined by carina, rim smooth and elevated, dorsal sculpture microalveolate (figs. female: 2F, 8A; male: 8C) *L. plorator* (Cockerell, 1910b)

Taxonomy

Subgeneric diagnosis: body length moderately large (female: 8.32 mm to 10.83 mm; male: 8.01 mm to 10.21 mm), robust, non-metallic species; in both sexes, body colour black (figs. 5A–D, 7A–D, 8A–D, 9A–D) except *L. lithusca* metasoma red-brown (figs. 6A–D); *L. tertium* male metasoma either black (figs. 9C–D) or banded with alternating dark to light red-brown tergal colours (fig. 2D); mesoscutum and metasomal terga of *L. davide* and *L. plorator* with tinge of deep blue colour (figs. 5A, 8A); female inner eye widths vary from narrowed to almost parallel to diverging basally from upper to lower inner eye widths (e.g. in *L. tertium* lower inner eye width 1.2 x upper inner eye width), meaning head widened ventrally (fig. 1A), and gena width enlarged (fig. 9B), (Australian *Lasioglossum* subgenera typically with eyes widths converging basally – e.g. *L. (Parasphcodes) hiltacum* (Smith, 1853) lower inner eye width 0.94 x upper inner eye width (fig. 1B)); female bidentate mandible modified by elongation and enlargement of preapical tooth, reduction in width of basal tooth, enlargement of height and width at base of mandible, reduced width of condylar groove (figs. 1C, 1E) (see Table 1 for comparison of *Australictus* (figs. 1C, 1E) with *Parasphcodes* (figs. 1D, 1F)); labrum medium process apically truncate, laterally pectinate (fig. 2A); pronotum with rounded dorsolateral angles (figs. 5A, 6A, 7A, 8A, 9A); wing veins with second transverse cubital vein (1rs-m) strong, 1st recurrent vein (1m-cu) entering second submarginal cell or in line with 1rs-m except in *L. tertium*, where 1st recurrent vein enters third submarginal cell; female hind basitibial plate rounded to weakly pointed apically; female anterior metatibial spur finely serrate (fig. 2B) to smooth; dorsal surface of metapostnotum either carinate, as defined by raised carina forming raised lip or ridge (fig. 2E), or acarinate, as defined by crescent-shaped, elevated

Table 1. Female mandibular morphological differences between *Lasioglossum* subgenera *Australictus* and *Parasphecodes*. (Note: *L. (Australictus) lithusca* and *L. (Parasphecodes) hiltacum* were used for measurements)

Character	<i>Australictus</i> (figs. 1C, 1E)	<i>Parasphecodes</i> (figs. 1D, 1F)
Preapical tooth length	Preapical tooth elongated to almost same length (0.93 x length) as basal tooth	Preapical tooth shorter than length (0.79 x length) of basal tooth
Preapical tooth width	Preapical tooth enlarged and broader (1.14 x width) than width of basal tooth	Preapical tooth not enlarged and narrower (0.42 x width) than width of basal tooth
Basal tooth width	Width of basal tooth 0.13 x width of base of mandible	Width of basal tooth 0.21 x width of base of mandible
Condylar groove	Width of condylar groove 0.14 x width of base of mandible between the acetabulum and condyle	Width of condylar groove 0.18 x width of base of mandible between the acetabulum and condyle
Base of mandible width in side view	Base of mandible length between acetabulum and condyle at 0.53 x length of mandible	Base of mandible length between acetabulum and condyle at 0.44 x length of mandible
Base of mandible width in dorsal view	Dorsal width at base of mandible 0.47 x length of mandible	Dorsal width at base of mandible 0.21 x length of mandible

medium area distinctly raised above vertical and lateral surfaces (fig. 2F); in both sexes, metasomal terga of *L. peraustrale* and *L. tertium* with conspicuous basal bands of tomentum on metasomal T2–T3 (figs. 7A–D, 9A–D), *L. davide*, *L. lithusca* and *L. plorator* without such metasomal tergal tomentum bands (figs. 5A–D, 6A–D, 8A–D). Male: some species with lateral hair tufts on metasomal S3–S5 (figs. 6F, 7F, 8F, 9F); genitalia with gonobase widened basally (figs. 10A, 11C) or narrowed (figs. 10C, 10E, 11A), gonostylus small (figs. 10A, 10B, 11A) to absent (figs. 10E, 11C), retrorse lobes small (figs. 11A, 11C) to enlarged (figs. 10A, 10C, 10E), either not meeting at midline (figs. 10A, 10E) or overlapping at midline (fig. 10C), either glabrous (figs. 10A, 11A, 11C) or setose (figs. 10C, 10E).

Notes. The elongated and enlarged preapical mandibular tooth, the narrowing of basal tooth and condylar groove, enlargement at the base of the mandible, the widening of the head basally and the enlargement of the gena are all adaptations to provide effective wood-splitting and wood-excavating mandibles for female *Australictus* to nest in wood rather than in soil as is usual for Halictidae bees.

Several specimen labels (at least five labels) refer to collected specimens found nesting in “rotten wood”, and one specimen had a label observation “from *Sirex* emergence hole”.

A series of Facebook images by Christopher Robbins for *L. (Australictus) plorator* documented the wood excavation nesting of this species (figs. 3A–F). The same species was also found using a vacated beetle exit hole as a nesting site in wood (fig. 4) (<https://www.facebook.com/groups/1041684025880609/search?q=christopher%20robbins>).

Christopher Robbins posted these bee observations with his Facebook images:

Chapple Vale, Victoria 19/04/2020. Found today while splitting wood. There was no bark on the log though, the crack in the log they make their tunnels into where the brood cells were filled with old termite bed from an extinct termite colony.

There were four adults all up and two pupae. They do not seem to worry about their access point to the log, they used cracks on the top, sides and underneath, in some cases they had excavated the chambers into decayed wood, a reddish wood rot, I believe commonly known as red cube rot, we used to find the larvae of a small reddish stag beetle in the same substrate.

These images and observations demonstrate that *Australictus* bees nest in wood.

Danforth et al. (2019) summarised the nest architecture of bees. The most common nesting strategy used by solitary bees is ground nesting in soil. An estimated 64% of non-parasitic bee species nest in underground soil excavations (Cane and Neff, 2011). However, a few bee species excavate nests in wood (both solid and rotten). Of the 27 known subfamilies of bees worldwide, wood-nesting occurs primarily in only the subfamilies Xylocopinae, Lithurginae and Callomelittinae (Danforth et al., 2019). The tunnels and cells of wood-nesting bees are entirely constructed using their mandibles, and wood-nesting bees have modified mandibles that differ from the mandibles of ground soil-nesting bees.

Most Halictidae are ground soil-nesting bees, and halictid bees show limited diversity in their mandibular structures (Danforth et al., 2019). However, wood-nesting halictids have been recorded in several Halictini genera. Of the 37 genera of halictine Augochorini that occur in North and South America, four are known to nest in wood (*Augochlora* Smith 1853, *Megalopta* Smith 1853, *Neocorynura* Schrottky 1910 and *Xenochlora* Engel, Brooks and Yanega 1997 (Tierney et al., 2008). Wood-nesting halictids have specialised bidentate mandibles (Michener and Fraser, 1978). The mandible of wood-excavating halictids is characterised as more stout and more robust than the mandible shape of ground soil-nesting Halictidae, with modified apical teeth, in particular an elongated and enlarged preapical tooth; the mandible is widened at its base and has groove variations on the outer and inner surfaces (Michener and Fraser, 1978).

Australictus is the first record of wood nesting for any Australian Halictidae. The bidentate mandible of *Australictus* looks similar in shape and structure to the mandible of the wood-nesting *Lasioglossum* subgenus *Eickwortia* McGinley 1999, especially the elongated and enlarged preapical tooth found in both subgenera (for an *Eickwortia* mandible image, see Gibbs and Dumes, 2013, fig. 3). However, *Australictus* belongs to the informal “strong-veined” *Lasioglossum* series, whereas *Eickwortia* belongs to the informal “weak-veined” *Hemihalictus* series of *Lasioglossum*, which can be recognised by the weakened 1rs-m and 2rs-m veins in the forewing (Michener, 2007; Gibbs and Dumes, 2013).

Species descriptions

Lasioglossum (Australictus) davide (Cockerell)

(Figs. 2E, 5A–F, 10A–B, 12A)

Halictus davidis Cockerell 1910a: 234.

Halictus kurandensis Cockerell 1910a: 234. **syn. nov.**

Halictus nigroscopaceus Friese H. 1917 **syn.** by Cockerell 1929: 211.

Lasioglossum (Australictus) davide – Michener 1965: 165.

Lasioglossum (Australictus) kurandense – Michener 1965: 165.

Lasioglossum (Australictus) nigroscopaceum – Michener 1965: 165.

Material examined: Holotype of *davidis* ♀, Queensland, Kuranda (has Cairns typed on label and Kuranda hand written), 4.02. Turner BMNH Hym.17.a.914 (BMNH) (view type data and image at <https://data.nhm.ac.uk/object/f00271eb-7e4e-41fb-9e8d-2736fa9ff79f> accessed 16 August 2022).

Holotype of *kurandensis* ♂, Queensland, Kuranda (Cairns typed on label and Kuranda handwritten), 4.02. Turner BMNH Hym.17.a.956 (BMNH) (view type data and image at <https://data.nhm.ac.uk/object/eleec50b-a2b4-4b89-84ca-6bea23587e8e> accessed 16 August 2022).

Syntypes (“TYPUS”) of *nigroscopaceus* – Queensland: Malanda, Mjöberg. All three specimens have same label and type number: Am. Mus. Nat. Hist. Dept. Invert. Zool. No. 26926 (2♀, 1♂). The male specimen has Cockerell’s handwritten label saying “*Halictus davidis* CKII” (AMNH).

Other specimens examined: (13♀, 6♂): QUEENSLAND: (1♀) Upper Mulgrave 19 June 1991, J.H. Barrett, nesting in rotten log (QDPI); (1♀) Tully Falls, S.F. 730m, 18 km SSW Ravenshoe, 7 Dec 1987 – 7 Jan 1988, R. Storey & B. Dickinson (QDPI); (1♀) Mt Halifax summit, 45 km WNW Townsville, 4 Dec 1990 – 8 Jan 1991, A. Graham, pitfall and intercept traps (QDPI); (1♀) Mt Halifax summit, 45 km WNW Townsville, 2 Dec 1990, A. Graham, hand collecting (QDPI); (1♀) Mt Lewis nr Mossman, 22 Oct 1984, N.W. Rodd (AM); (1♀, 1♂) Cairns District, F.P. Dodd (SAM); (2♀) Kuranda, 2 Jan 1953 & 25 Sept 1954, GB (NMV); (5♀, 3♂) Kuranda Black Mountain Forest Road, Jan 2001, K. Walker, on *Lophostemon grandifloris* subsp. *riparius* (NMV); (1♂) Kuranda, Jan 1952, J.G. Brooks (AM); (1♂) Mt Spec Nat. Pk, 10 km E Paluma, 22 Nov 1988, K. Walker, on *Eucalyptus* (NMV).

Floral record: Family visited: 1 (Myrtaceae (2)). Genera visited: 2 (*Eucalyptus*, (1), *Lophostemon* (1)).

Flight phenology capture records: Jan (3) Feb (0) Mar (0) Apr (0) May (0) June (1) July (0) Aug (0) Sept (1) Oct (1) Nov (1) Dec (3).

Diagnosis. *Lasioglossum (Australictus) davide* is most like *L. (Australictus) plorator* in body colours. This species can be distinguished, in both sexes, from other *Australictus* species

by black body colour with bluish tinge on mesoscutum; the lack of tomentum on the mesosoma or metasoma; dorsal surface of metapostnotum posterior margin carinate, defined by raised posterior and lateral carinae; metapostnotum dorsal surface sculpture ruguloso-striolate (figs. 2E, 5A–D); male genitalia with gonobase widened basally (a characteristic shared only with *L. tertium*), large retrorse lobes with small, apically rounded gonostylus (figs. 10A, 10B); and males lacking any distinctive metasomal sternal vestiture (fig. 5F). This species is restricted to North Queensland (fig. 12A).

Description of female: (figs. 5A–B, 5E) body length: 9.58–9.68–10.21 mm (n=10); forewing length: 2.45–2.47–2.49 mm (n=10); head width: 2.78–2.88–2.93 mm (n=10); intertegular width: 2.06–2.38–2.40 mm (n=10). Relative head measurements: HW: 100, HL: 84–85, UID: 54–55, LID: 50–52, IAD: 08–09, OAD: 21–22, IOD: 08–09, OOD: 14–15, CL: 19–21, GW: 18–20, EW: 20–22, SL: 37–40, FL: 63–65.

Head: (fig. 5E) inner eyes margins weakly narrowed basally; median frontal carina reaching less than one third way to median ocellus; clypeus entirely polished and smooth, anterior half weakly concave medially, sparsely deeply punctate, punctures rounded to elongate; supraclypeal area distinctly raised above paraocular area, polished, smooth, punctures small, round and open with small rounded punctures; frons sculpture above antennal bases smooth but dull, microtessellate with small punctures for setae insertion points, paraocular area smooth and closely punctate.

Mesosoma: (fig. 5A) mesoscutum anterior mesial margin weakly produced mesoanteriorly, surface smooth with dull, “oily” sheen, medially openly punctate, laterad of parapsidal areas closely punctate, parapsidal areas and posterior margin densely punctate; scutellum 2 x as long as dorsal surface of metapostnotum, scutellum smooth, with dull sheen, weakly, openly punctate; dorsal surface of metapostnotum carinate (fig. 2E), posterior margin with well-defined, raised, semicircular carina and posterolateral carinae, dorsal surface transversely ruguloso-striolate medially, striate laterally, sculpture reaches posterior carina, lateral margins smooth microalveolate, vertical posterior surface of metapostnotum defined by lateral carinae meeting dorsal surface posterolateral carinae; mesepisternum and metepisternum plicate; first recurrent vein (1m-cu) meeting 1rs-m vein or entering second submarginal cell.

Metasoma and legs: (figs. 5A, 5B) metasomal T1–T5 dull, smooth, closely to densely punctate with minute punctures; anterior metatibial spur finely serrate to simple, with no distinct teeth.

Colour: (figs. 5A, 5B) body and legs black except mesoscutum and scutellum dark “oily” grey with bluish tinge.

Vestiture: (figs. 5A, 5B, 5E) sparse, clypeus and supraclypeal area glabrous, frons with sparse small, black, erect hair; mesoscutum and scutellum almost glabrous but with sparse small, black, erect hair; long hair on lateral, vertical posterior surface of metapostnotum; apical one third of T1 with long, erect, white hair, remainder of T1 and T2 glabrous, T3 and T4 with some black, adpressed hair apically.

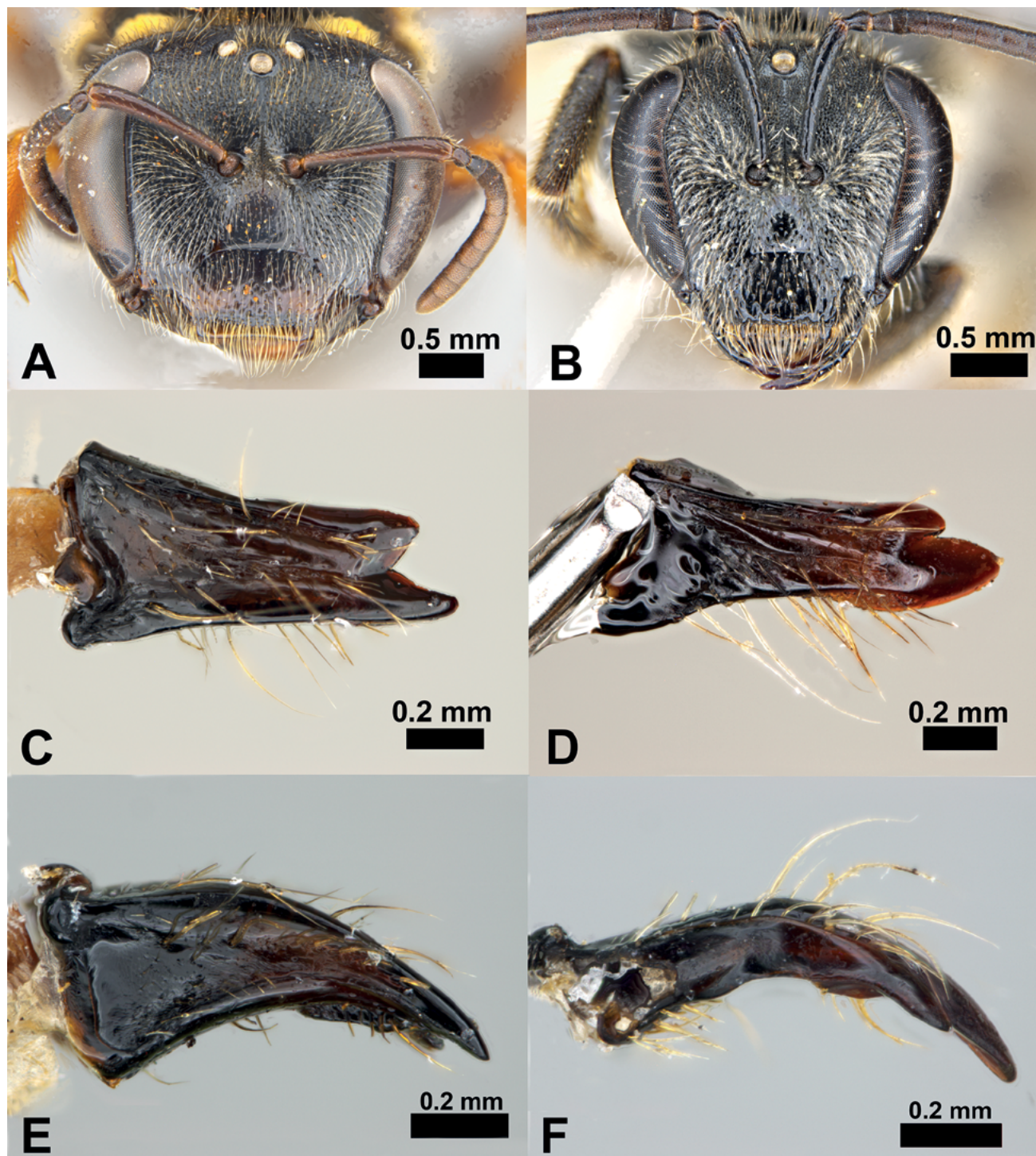


Figure 1. *LasioGLOSSUM (Australictus) tertium* A; *LasioGLOSSUM (Australictus) lithusca* C, E; *LasioGLOSSUM (Parasphecodes) hiltacum* B, D, F. Head front: A & B; Mandible outer view: C & D; mandible dorsal view: E & F. All female images.

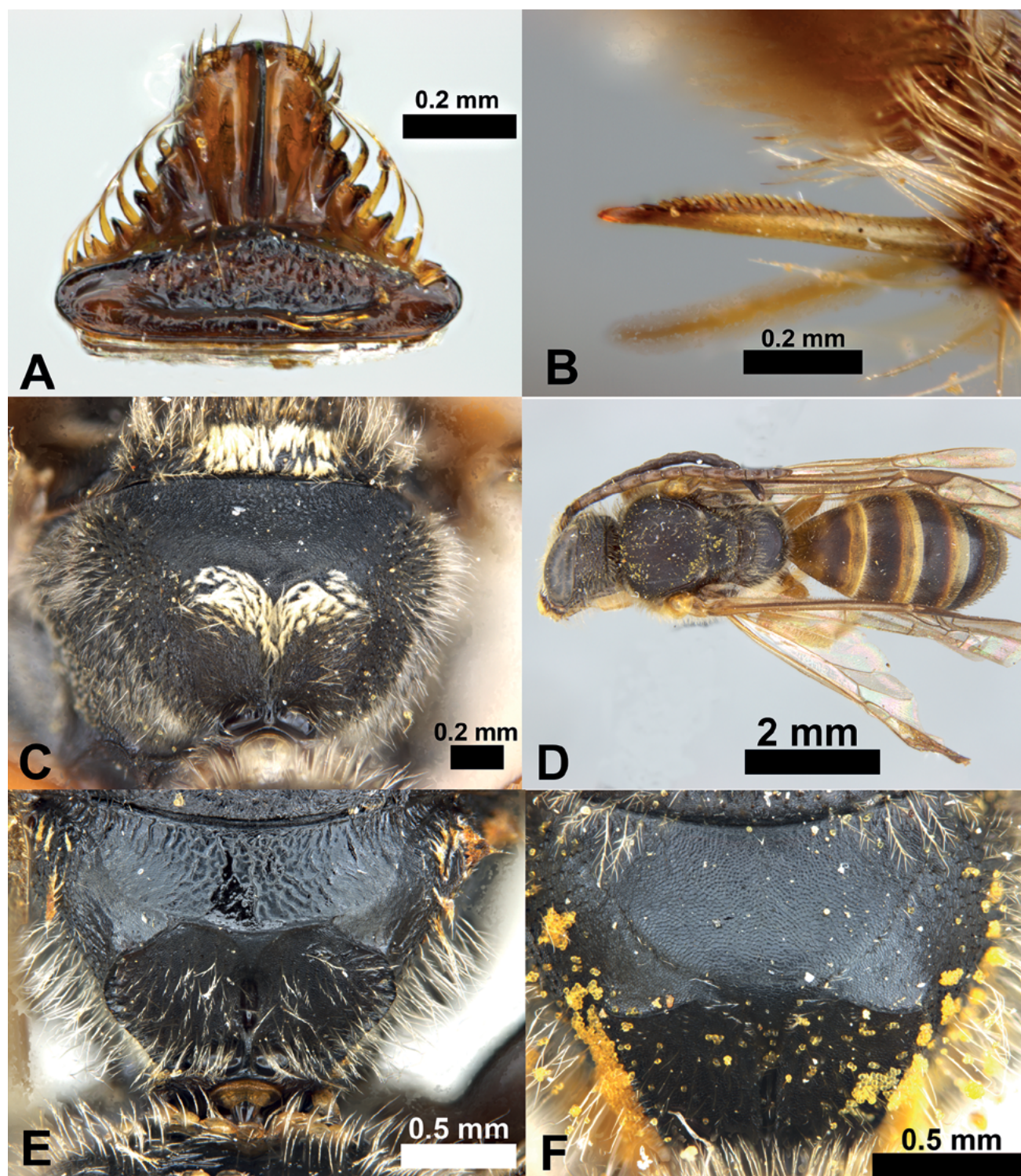


Figure 2. A, *Lasioglossum (Australictus) lithusca* female labrum; B, *Lasioglossum (Australictus) tertium* female anterior metatibial spur; C, *Lasioglossum (Australictus) peraustrale* male vertical metapostnotum tomentum; D, *Lasioglossum (Australictus) tertium*, banded male metasoma form; E, *Lasioglossum (Australictus) davide* female dorsal surface of metapostnotum; F, *Lasioglossum (Australictus) plorator* female dorsal surface of metapostnotum.

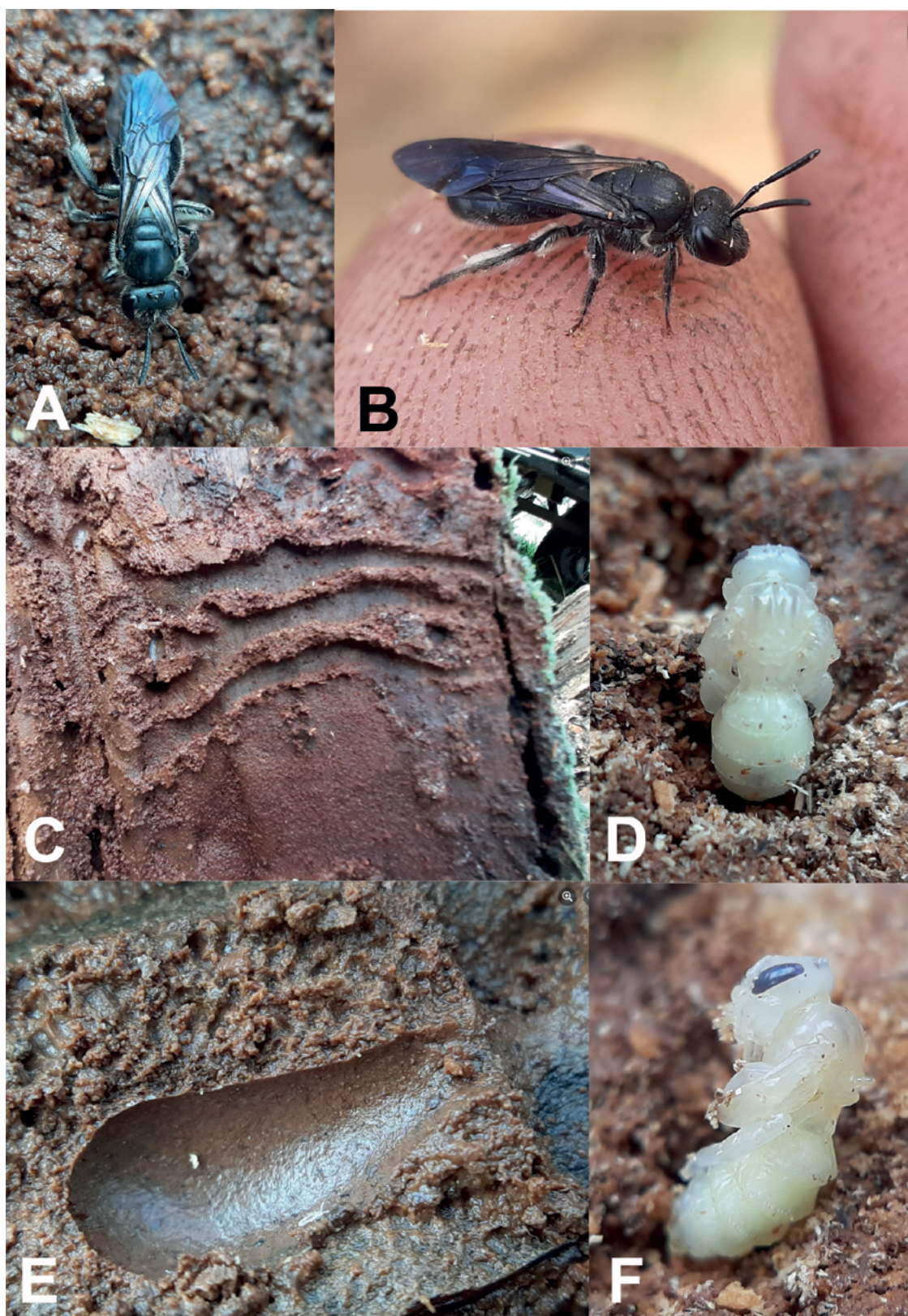


Figure 3. A–F *Lasioglossum* (*Australictus*) *plorator*: A, B, live female; C, wood nesting gallery construction; D, dorsal view of pupa; E, brood cell; F, lateral view of pupa. All images copyright Christopher Robbins.



Figure 4. *Lasioglossum* (*Australictus*) *plorator* female using a beetle exit hole in wood. Image copyright Christopher Robbins.

Description of male: (figs. 5C, 5D, 5F) body length: 7.07–8.45–8.79 mm (n=6); forewing length: 1.94–2.48–2.54 mm (n=6); head width: 1.82–2.42–2.50 mm (n=6); intertegular width: 1.44–2.15–2.21 mm (n=6). Relative head measurements: HW: 100, HL: 88–89, UID: 56–57, LID: 42–43, IAD: 12–13, OAD: 23–24, IOD: 15–16, OOD: 14–15, CL: 26–29, GW: 16–18, EW: 28–29, SL: 20–23, AF4/AF2+3 (18/14, 20/14) 1.29–1.43, FL: 178–180.

Differs from female as follows: inner eyes converging more basally; median frontal carina reaching about one quarter to median ocellus; frons sculpture reticulate across surface to inner margins of eyes; scape reaches basally level of median ocellus; clypeus surface shiny weakly microtessellate basally, medium area rounded not concave, openly punctate, supraclypeal area protruding above paraocular area, supraclypeal area bulbous, shining, openly to closely punctate; mesoscutum surface similar to female in colour but densely punctate medially, openly punctate laterad of parapsidal areas, densely punctate in parapsidal areas and anterolaterally; scutellum shiny as in female but closely punctate; dorsal surface of metapostnotum same as in female, posteriorly carinate, dorsal surface ruguloso-striolate; apical two thirds of clypeus pale yellow and metasoma in some specimen with distinct blue tinge.

Vestiture: frons hair dense, erect, black; paraocular area hair sparse, white, adpressed; mesoscutum appearing glabrous but with sparse, short, erect, black hair; metapostnotum lateral sides with short, white, adpressed hair; apical posterior vertical posterior surface of metapostnotum glabrous;

metasomal sterna with moderately dense, short erect and adpressed black setae, no distinct patterns observed (fig. 5F).

Genitalia: (figs. 10A, 10B) gonobase widened basally, complete ventroapically, gonocoxa wider and longer than gonobase, with sparse, erect setae dorsoapically, glabrous ventrally, dorsal inner margins of gonocoxa basally rounded, apical inner margin not produced continuing contour of gonostylus, glabrous; retrorse lobes large, overlapping at midline, membranous, basal inner margins with short setae, apical inner margins of retrorse lobes glabrous; gonostylus small (about one third length of gonocoxa) erect, small, apically rounded, with sparse short setae; penis valves curved apically, with short dense hair dorsolaterally.

Distribution: (fig. 12A) the species is restricted to north Queensland between approximately Townsville to Cairns.

Remarks: Cockerell (1929: 211) synonymised *Halictus nigroscopaceus* with *Halictus davidis*; however, Michener (1965: 165) listed *Lasioglossum* (*Australictus*) *nigroscopaceum* as a valid species. Cockerell's (1929) synonymy was checked and accepted here. Due to the restricted distribution of this species, fewer than 20 specimens were located for this study. The only significant variation observed was in the body length of males (7.07 mm to 8.79 mm). *Lasioglossum davide* and *L. tertium* are the only two *Australictus* species in which the gonobase is widened basally (figs. 10A, 11C); in the other three *Australictus* species, the gonobase narrows basally (figs. 10A, 10E, 11A).

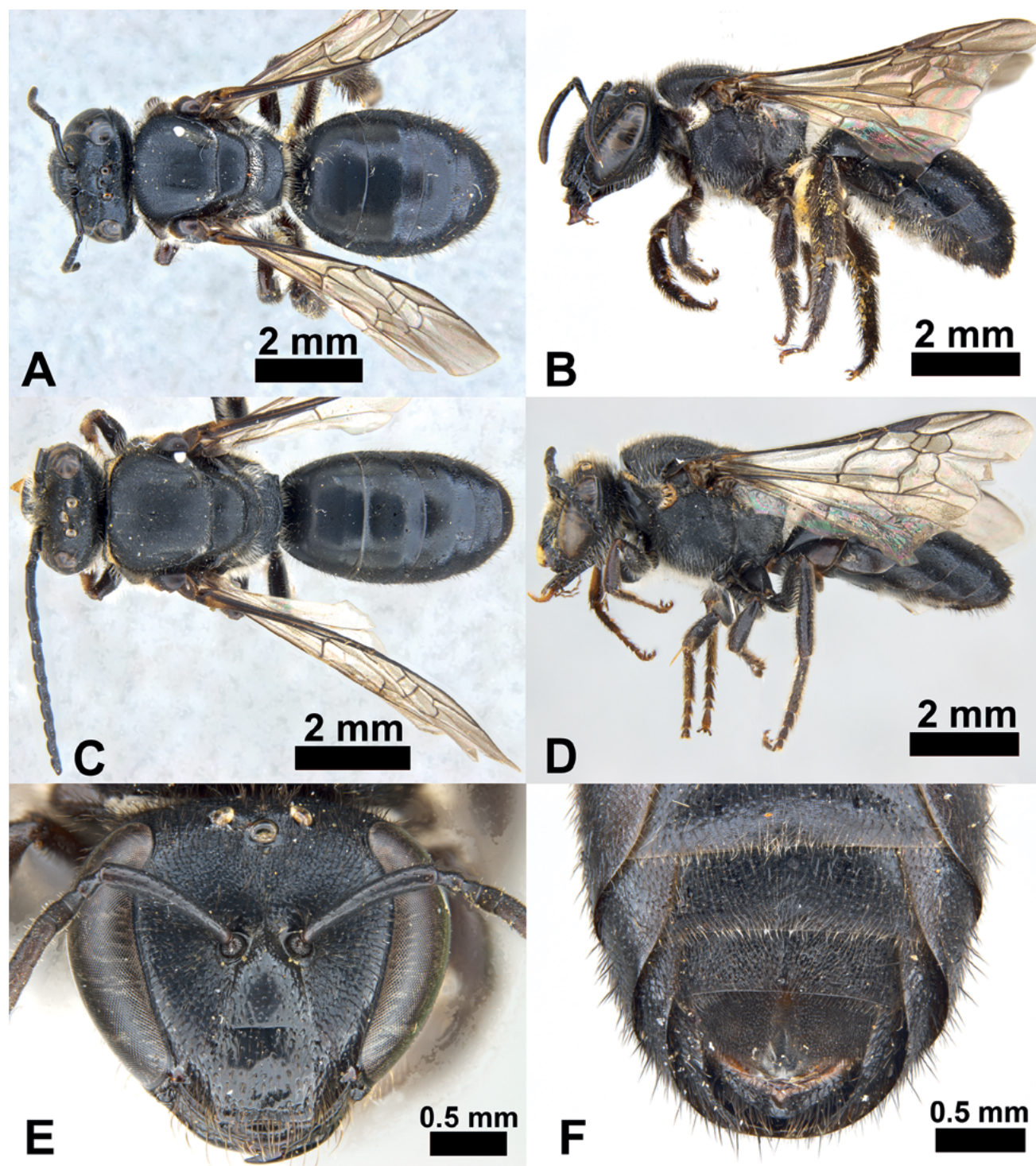


Figure 5. A–F *Lasioglossum (Australictus) davide*: A, dorsal female; B, lateral female; C, dorsal male; D, lateral male; E, female head front; F, male vestiture on metasomal sterna.

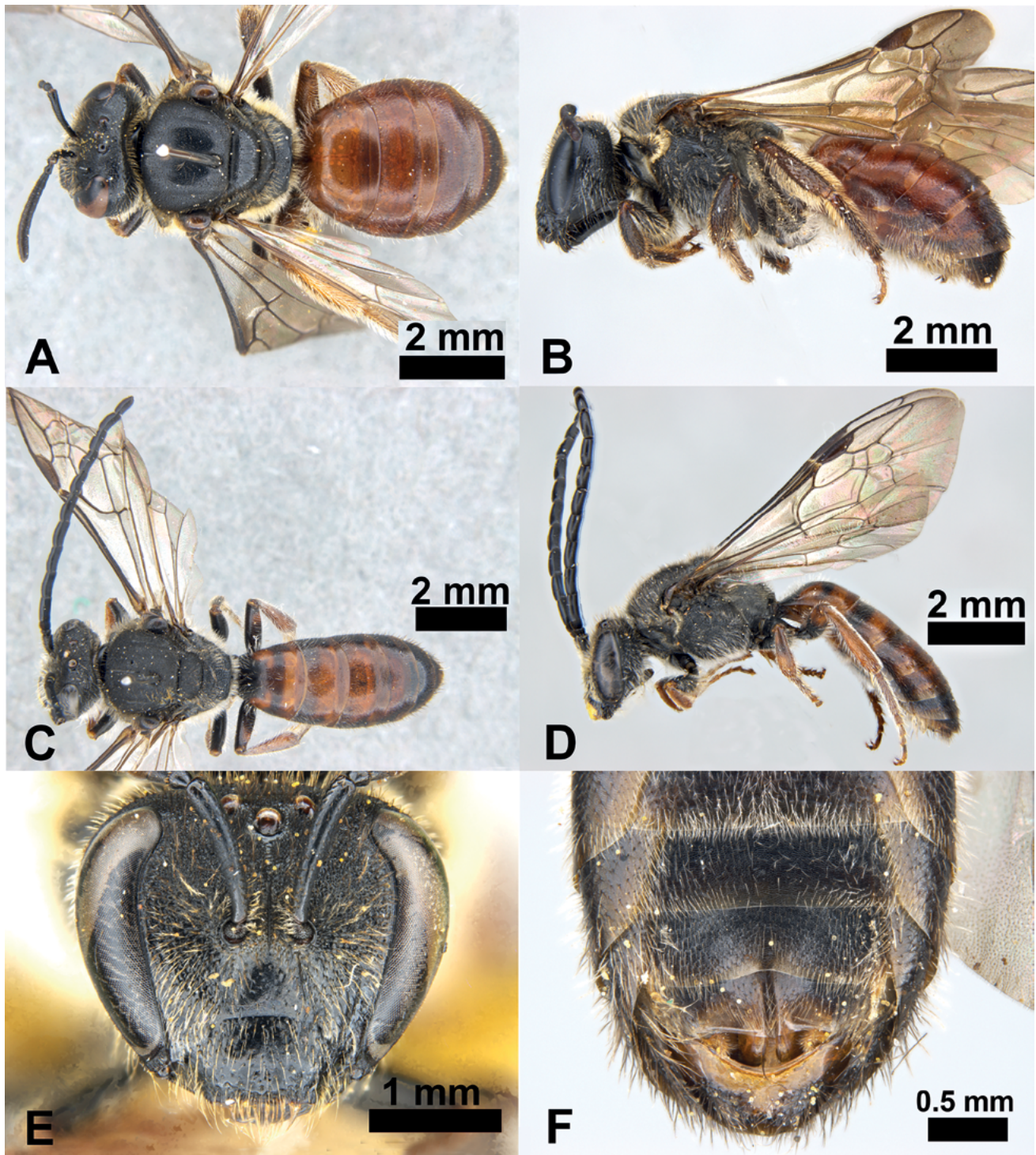


Figure 6. A–F *Lasioglossum (Australictus) lithusca*: A, dorsal female; B, lateral female; C, dorsal male; D, lateral male; E, female head front; F, male vestiture on metasomal sternum.

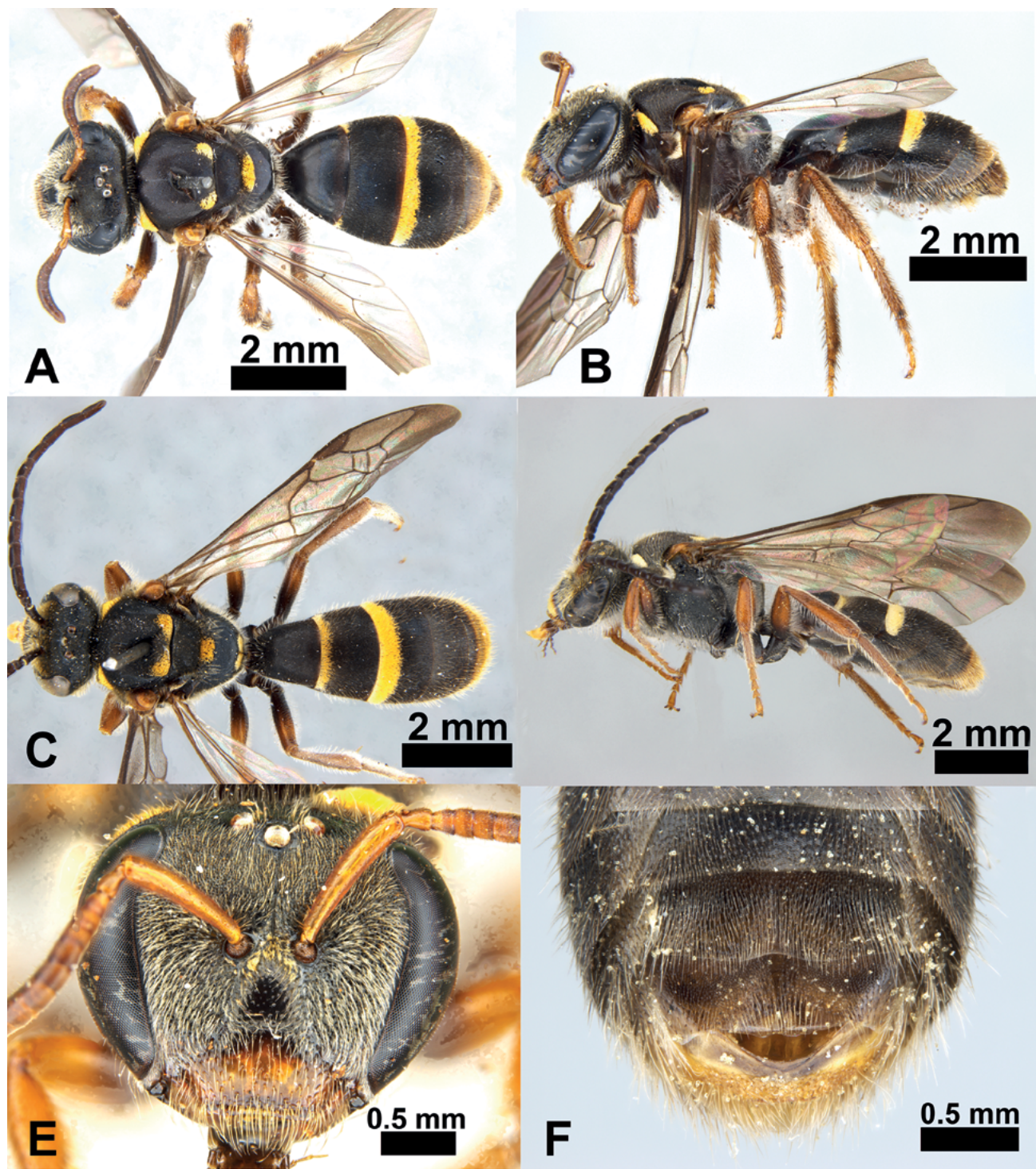


Figure 7. A–F *Lasioglossum (Australictus) peraustrale*: A, dorsal female; B, lateral female; C, dorsal male; D, lateral male; E, female head front; F, male vestiture on metasomal sterna.

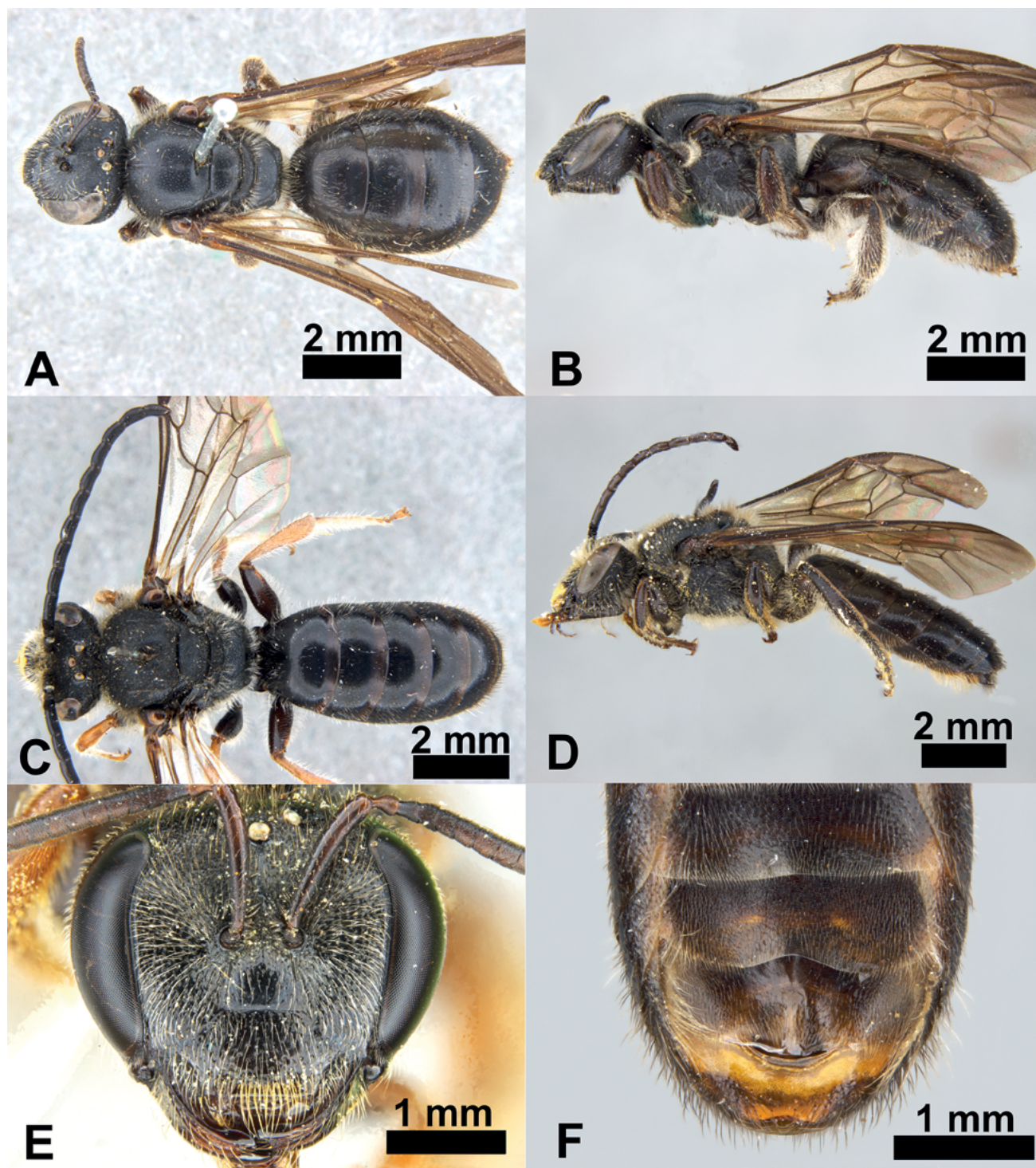


Figure 8. A–F *Lasioglossum (Australictus) plorator*: A, dorsal female; B, lateral female; C, dorsal male; D, lateral male; E, female head front; F, male vestiture on metasomal sternum.

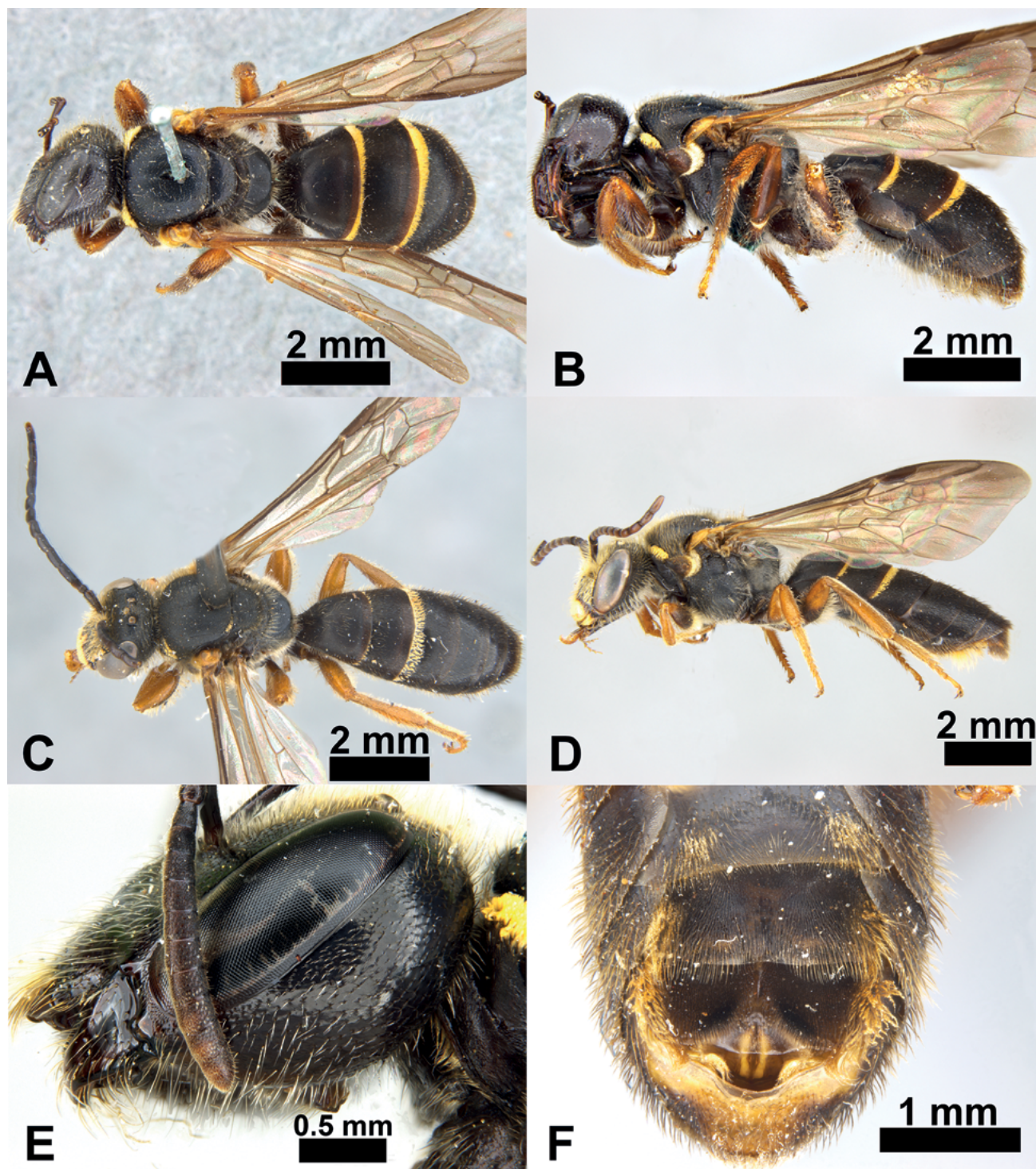


Figure 9. A–F *Lasioglossum (Australictus) tertium*: A, dorsal female; B, lateral female; C, dorsal male; D, lateral male; E, female head front; F, male vestiture on metasomal sterna.

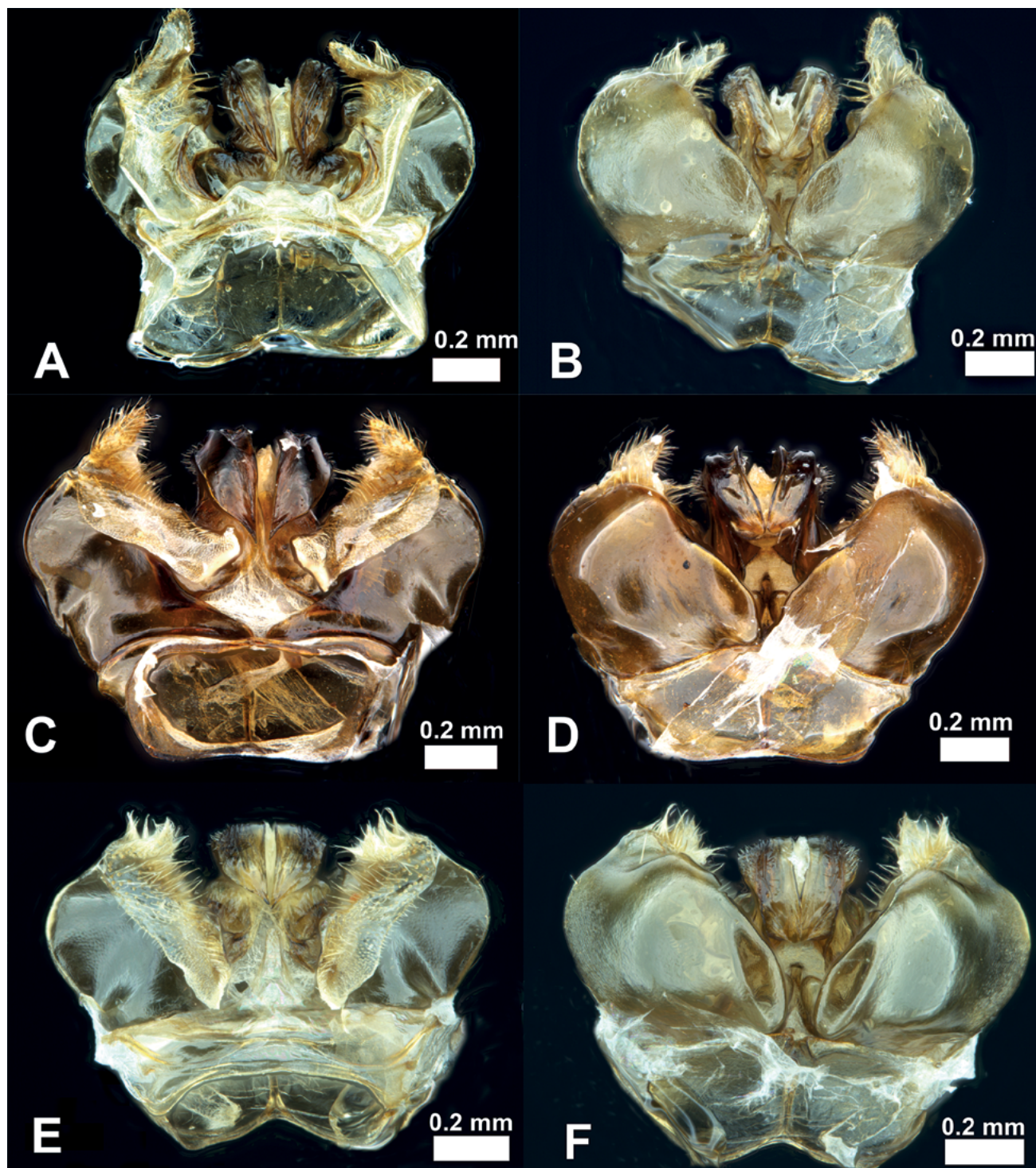


Figure 10. *Lasioglossum* (*Australictus*) male genital capsules: *Lasioglossum davide*, A, ventral view, B, dorsal view; *Lasioglossum lithusca*, C, ventral view, D, dorsal view; *Lasioglossum peraustrale*, E, ventral view, F, dorsal view.

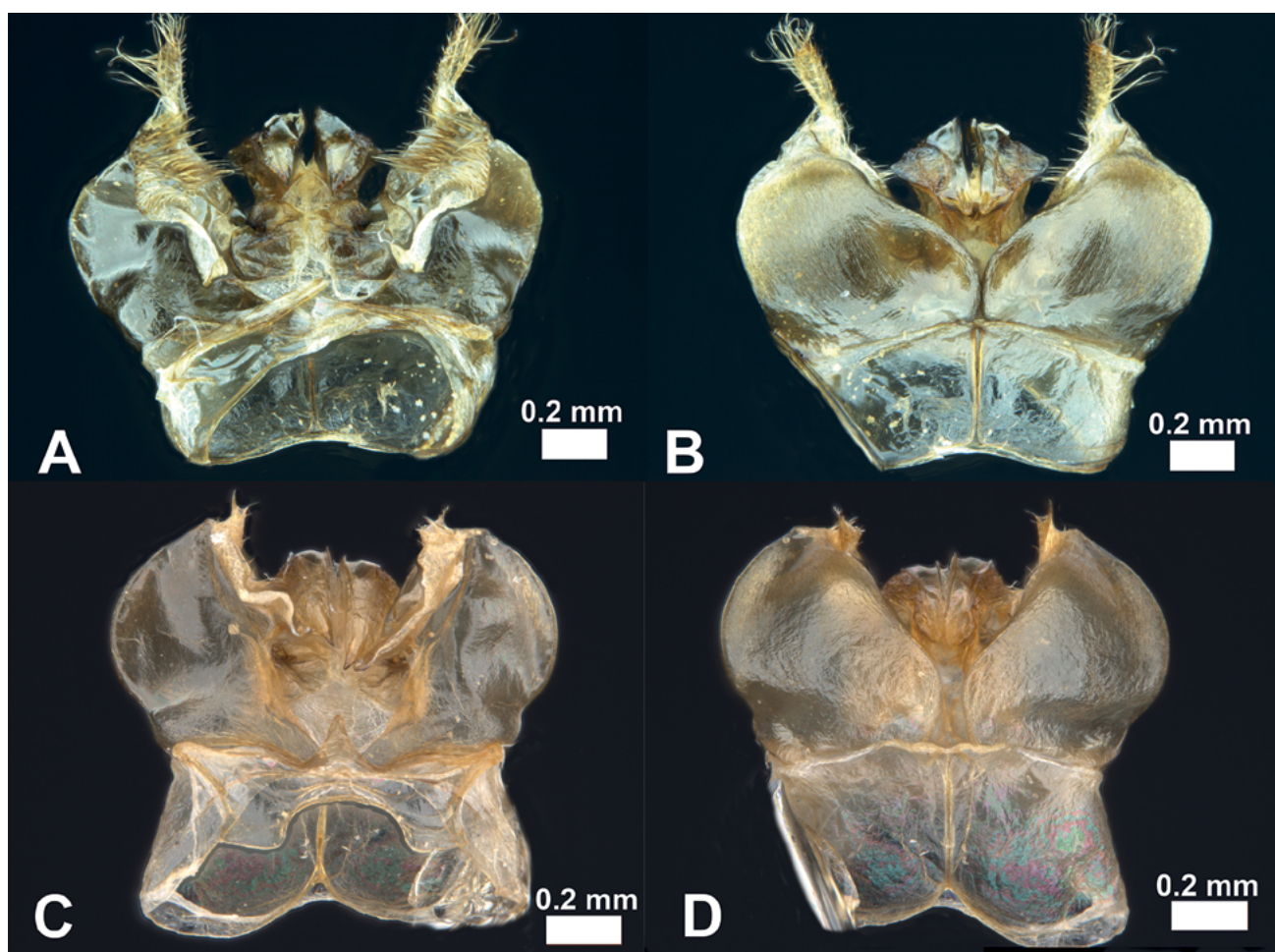


Figure 11. *Lasioglossum* (*Australictus*) male genital capsules: *Lasioglossum plorator*, A, ventral view, B, dorsal view; *Lasioglossum tertium*, C, ventral view, D, dorsal view.

***Lasioglossum* (*Australictus*) *lithusca* (Smith)**

(Figs. 1C, 1E, 2A, 6A–F, 10C–D, 12B)

Parasphecodes lithusca Smith 1853: 41.

Parasphecodes adelaidae Cockerell 1905: 297. **syn. nov.**

Parasphecodes wellingtoni griseipennis Cockerell 1929: 11. **syn. nov.**

Parasphecodes stuchila Smith 1853: 43. **syn. nov.**

Parasphecodes wellingtoni Cockerell 1914: 45. **syn. nov.**

Lasioglossum (*Parasphecodes*) *lithuscum* – Michener 1965: 168.

Lasioglossum (*Australictus*) *lithusca* **comb. nov.**

Lasioglossum (*Parasphecodes*) *adelaidae* – Michener 1965: 167.

Lasioglossum (*Parasphecodes*) *griseipenne* – Michener 1965: 168.

Lasioglossum (*Parasphecodes*) *stuchilum* – Michener 1965: 168.

Lasioglossum (*Parasphecodes*) *wellingtoni* – Michener 1965: 169.

Material examined: Holotype of *lithusca* ♀, Van Diemen's Land (ie. Tasmania) F. Sm Coll. 79.22 BMNH Hym.17.a.618 (BMNH) (view type data and image at <https://data.nhm.ac.uk/object/9179e027-f637-4d01-aff4-8cb0bc82d480> accessed 16 August 2022).

Holotype of *adelaidae* ♀, South Australia: Adelaide BMNH Hym.17.a.628 (BMNH) (view type data and image at <https://data.nhm.ac.uk/object/646ab614-8703-419a-9f3b-0805dbecac2e> accessed 16 August 2022).

<https://data.nhm.ac.uk/object/646ab614-8703-419a-9f3b-0805dbecac2e> accessed 16 August 2022).

Holotype of *griseipennis* ♀, New South Wales: Jenolan, 20 April W.P. Cockerell (ANIC).

Holotype of *stuchila* ♀, Van Diemen's Land (ie. Tasmania) F. Sm Coll. 79.22 BMNH Hym.17.a.613 (BMNH) (view type data and image at <https://data.nhm.ac.uk/object/2fe14c22-bac0-44f2-8f09-1250906cfbaf> accessed 16 August 2022).

Holotype of *wellingtoni* ♀, Tasmania, Mt Wellington Jan 15 – Feb 6 1913, 1,300–2,000 ft R.E. Turner. Four females are mentioned in the description but one specimen is labelled “type”. BMNH Hym.17.a.636 (BMNH) (view type data and image at <https://data.nhm.ac.uk/object/3b470052-986f-43f2-a975-7dab4b48a12e> accessed 16 August 2022).

Other specimens examined (239♀, 41♂): QUEENSLAND: (1♀) Mt Norman area, via Wallangarra, 7–8 Oct 1972, S.R. Monteith (ANIC); (1♀) Mt Norman area, via Wallangarra, 2–3 Oct 1971, G.B. Monteith (QM).

NEW SOUTH WALES & AUSTRALIAN CAPITAL TERRITORY: (2♀) 3.19 km SW Condor Ck Bridge, Brindabella Rd, 06 Nov 1992, G.J. Davis (NMV); (2♀) 1.9 km S Condor Ck, Bridge,

Brindabella Rd, 17 Oct 1993, G.V. Maynard & G.J. Davis, on *Davesia* sp. (NMV); (1♀) Lees Camp, Warks Rd, 10 Dec 1993, G.J. Davis on *Leptospermum* (NMV); (3♀) Bull's Head Repeater Station, 26 Nov 1994, G.V. Maynard & G.J. Davis, on *Pultenaea* and *Davesia* (NMV); (1♀) Hill W side Condor Ck Bridge, 06 Nov 1993, G.V. Maynard & G.J. Davis on *Davesia mimosoides* (NMV); (1♀) Jink Ck, Blue Mtns, 21 Jan 1982, N.W. Rodd (AM); (1♀) Mt Boboyan 6 March 1993, G.J. Davis on *Kunzea ericoides* (NMV); (4♀) New England Nat. Pk, 5 Nov 1981, N.W. Rodd (AM); (1♀) 8 km S Mt Wilson, Blue Mtns, 10 Oct 1978, N.W. Rodd (AM); (4♀) Mt Tomah Blue Mtns, 26–29 Aug 1977 – 2 Oct 1977, N.W. Rodd (AM); (3♀) Clyde Mt, 27 Oct 1968, (ANIC); (2♀) Picadilly Circus, Brindabella Ra., 24 Nov 1981, J.C. Cardale (ANIC); (1♀) Blundell's 15 Oct 1952, Paramonov (ANIC); (1♀) Blundell's, 14 Oct 1947, E.F. Riek (ANIC); (1♀) Blundell's, 13 Feb 1950, E.F. Riek (ANIC); (1♀) Blundell's, 10 Oct 1930, L.F. Graham (ANIC); (1♀, 1♂) Mt Gingera, 6 Feb 1951, E.F. Riek (ANIC); (3♀) Winburndale, 12 mi E Bathurst, 6 Dec 1974 (ANIC); (2♂) Bendora, 6 Feb 1952, E.F. Riek (ANIC); (1♀) Brindabella, 24 Nov 1931, L.F. Graham (ANIC); (1♀) Bull's Head, 26 Feb 1952, L.J. Nick (ANIC); (1♀) Mt Tomah, Blue Mtns, 5 Nov 1980, N.W. Rodd (AM); (30♀) Picadilly Circus, Brindabella Ra., 1 Nov 1988, R.R. Snelling & J. Grey #88 (LACM); (2♀) Mt Victoria, 20 Oct 1930, A.N. Burns (NMV); (10♀) NE Nat. Pk, near Entrance, 04–20 Nov 1960, C.W. Frazier (ANIC); (1♂) New England Nat. Pk, via Ebor, 22–23 Jan 1966, B. Cantrell (QM); (1♀) 15 km SW Ebor, 12 Dec 1984, D. Yeates, on *Leptospermum myrtifolium* (ANIC); (1♀, 1♂) Nadgee Reserve, 4 km N Newton's Beach, 29 Dec 1985, E.A. Sugden (AM); (1♂) Guthega Pondage, Kosciusko Nat. Pk, 16 Mar 1983, G.R. Brown & A.E. Westcott by sweeping (OAI).

VICTORIA: (11♀) Warburton, 19 Dec 1968, E.M. Exley, on *Leptospermum ericoides* (QM); (1♀) Halls Gap, 1 Nov 1928, GB (SAM); (1♀) Black Sands, 16 Oct 1936 (ANIC); (1♀) Brisbane Ranges, Oct 1982, P. Bernhardt, on *Acacia* (NMV); (1♀) Mason's Ck, Kinglake, 20 Oct 1976, A.A. Calder (NMV); (3♀) Gorae West, 7 Oct 1957, A.N. Burns (NMV); (18♀) Gorae West, 10 Jan 1950, T. Rayment (ANIC); (1♀) Cockatoo, 24 Dec 1950, RD (NMV); (1♀) Arthur Plain, 4 Feb 1965, Neboiss (NMV); (1♀) Ferntree Gully, 1909, F.P. Spry (ANIC); (4♀) Grampians, Oct 1928, F.E. Wilson (NMV); (1♀) Reefton, 9 Feb 1955, Neboiss (NMV); (1♀) Brighton (NMV); (23♀, 31♂) Mt Hotham, 18 March & 6 April 2021, K. Walker, on *Achillea millefolium* (NMV); (2♀) Portland, Dec 1979, G. Knerer (NMV); (1♀) Asgard Swamp, 4 km NE Victoria, 10 Oct 1981, G.R. Brown (OAI); (1♀) Mt Drummer, 4 Dec 1956, E.F. Riek (ANIC); (2♀) Mt Difficult, Grampians, 2600 ft, 2 Jan 1966, B. Cantrell (QM); (1♀) Mt St Bernard, 4000 ft, 9 Jan 1932, A.N. Burns (NMV); (3♀) Flowerdale, 8 Dec 1954, Neboiss (NMV); (1♀) Mt Donna Buang, 5 Feb 1955, Neboiss (NMV); (1♀) Ferntree Gully, 1 Nov 1911, A.D.D. (NMV); (1♂) Crystal Brook, Mt Buffalo, 24 Feb 1955, A.N. Burns (NMV); (1♀) 5 km W Toolangi, 7 Nov 2000, Thomas Walker, on *Ranunculus lappaceus* (NMV).

TASMANIA: (1♀) Huon Camping Area, 25 Jan 1983, I.D. Naumann & J.C. Cardale (ANIC); (3♀) Mt Wellington, 2,500 ft, Feb 1936, A.J. Turner (QM); (1♀) Mt Field Nat Pk, 13 Jan 1997, A. Hingston (NMV); (1♀) 5 km WNW Mt Alma, 27 Jan 1981, I.D. Naumann & J.C. Cardale (ANIC); (2♀) SW Nat. Pk, (Tyenna) 11 Jan 1997, A. Hingston (NMV); (2♀) Tasmania, A. Simson (SAM); (5♀) 6 mi SW Queenstown, 1 Jan 1969, E.M. Exley on *Melaleuca* (QM); (4♀) 11 mi E Strahan, 1 Jan 1968, E.M. Exley, on *Melaleuca* (QM); (6♀) 9 mi E Strahan, 1 Jan 1969, E.M. Exley, on *Bursaria* (QM); (2♀) just N of junction of Waratah & Murchison Hwys, 31 Dec 1968, E.M. Exley (QM); (1♀) nr Nunamarra, 9 Jan 1969, E.M. Exley, on *Melaleuca* (QM); (4♀) Marawah, 30 Jan 1949, E.F. Riek (ANIC); (1♀) Southport, 18 Jan 1948, E.F. Riek (ANIC); (1♀) Meredith R, 12 mi from Corinna, 6 Jan 1954, T.G. Campbell (ANIC); (1♀) Derwent R, 740 m Lake St Clair, 24–28 Jan 1980, Lawrence & Weir (ANIC); (1♀) 7 km SWW Derwent Bridge, 16 Jan – 2 Feb 1983, I.D. Naumann & J.C. Cardale, ex pantrap (ANIC); (1♀) 7 km S Frodshams Pass, 25 Jan 1983, I.D. Naumann & J.C. Cardale (ANIC);

(1♀) Lake St Clair, 15 Apr 1955, T. Rayment (ANIC); (1♀) Lake St Clair, alt. 2,500 ft, 08 Apr 1956, T. Rayment (ANIC); (1♀) Collinsvale Road, 6 Jan 1972, W.F. Calvert (TDA); (1♀) Scarlet Ck, 3 km W Collingwood R, 8 Jan 1992, G. & A. Daniels (QM); (1♀, 1♂) 3.5 km SE Murdunna, 10 Feb 1988, G. & A. Daniels (QM); (1♀) 22 km N Dunkeld, 6 Nov 1988, R.R. Snelling & J. Grey (LACM); (8♀) Hasting, 15 Jan 1949, E.F. Riek (ANIC); (1♀) Hobart, 4 March 1989, K. Walker, on *Eucalyptus* (NMV); (1♀) Melaleuca nr Bathurst Harbour, 9 Nov 1991, I. Naumann & G. Clarke, heathy sedge land & closed forest margin (ANIC); (1♀) Melaleuca nr Bathurst Harbour, 3–7 Dec 1990, I. Naumann, margin *Melaleuca* / *Leptospermum* (ANIC); (2♀) Celery Top Is., Bathurst Harbour, 4 Dec 1990, I.D. Naumann (ANIC); (1♀) Claytons, Bathurst Harbour, 6 Dec 1990, I.D. Naumann (ANIC); (1♀) Railton, 8 Jan 1991, B.B. Lowery, in rotten log (ANIC); (1♀) Liffey Valley, May 1980, S. Fearn, ex alcohol storage (ANIC); (2♀) 9 km WSW Derwent Bridge, 21 Jan 1983, I.D. Naumann & J.C. Cardale (ANIC); (2♀) Mt Wellington, 6 Jan 1918, G.H. Hardy (QM); (4♀) Hobart, 10 Dec & 20 Dec 1913, G.H. Hardy (QM); (1♀) Lake St Clair, 13 Jan 1937, C. & C. Davis (AM); (1♀) Pieman Bridge, 8 Jan 1937, C. & C. Davis (AM); (1♀) Dover, 1963, from Sirex emergence hole (QM).

SOUTH AUSTRALIA: (1♀) Adelaide (BMNH).

Floral record: Families visited: 6 (Asteraceae (2), Fabaceae (4), Orchidaceae (1), Myrtaceae (11), Pittosporaceae (2), Ranunculaceae (1)). Genera visited: 10 (*Acacia* (1), *Achillea* (2), *Brenesia* (1), *Bursaria* (2), *Davesia* (2), *Kunzea* (1), *Eucalyptus* (3), *Leptospermum* (3), *Pultenaea* (1), *Ranunculus* (1)).

Flight phenology capture records: Jan (27) Feb (14) Mar (7) Apr (3) May (1) June (0) July (0) Aug (1) Sept (0) Oct (17) Nov (14) Dec (14).

Diagnosis. *Lasioglossum (Australictus) lithusca* is unlike any other *Australictus* species in body colour. This species can be distinguished, in both sexes, from other *Australictus* species by red-brown-coloured metasoma contrasting with black mesosoma; lack of tomentum on mesosoma or metasoma; dorsal surface of metapostnotum posterior margin acarinate but dorsal surface elevated above surrounding lateral and vertical surfaces; metapostnotum dorsal surface sculpture ruguloso-striolate (figs. 6A–D); male genitalia with gonobase narrowed basally, large retrorse lobes and small, erect gonostylus (figs. 10C–D); and metasomal sternal S5 lateral margins with distinct white, semi-erect hair tufts (fig. 6F). This species occurs in SE Australia, including Tasmania (fig. 12B).

Description of female: (figs. 6A, 6B, 6E) body length: 9.11–10.49–10.83 mm (n=10); forewing length: 2.73–2.76–2.78 mm (n=10); head width: 2.64–2.72–2.78 mm (n=10); intertegular width: 1.92–2.04–2.06 mm (n=10). Relative head measurements: HW: 100, HL: 88–90, UID: 56–57, LID: 53–54, IAD: 10–11, OAD: 22–23, IOD: 14–15, OOD: 14–15, CL: 23–25, GW: 21–23, EW: 21–23, SL: 39–40, FL: 71–73.

Head: (fig. 6E) inner eyes weakly narrowed basally; median frontal carina reaching about than one third way to median ocellus; clypeus smooth, polished with microtellesate sculpture on basal one third, medially flattened to weakly concave, closely punctate with large, deep, rounded punctures, medially with vertical grooves, supraclypeal area distinctly raised above paraocular area, surface dull, dense microtessellate pattern, open to sparsely punctate with shallow punctures; frons dull, close, vertical striae and punctate, paraocular area smooth, shining closely punctate.

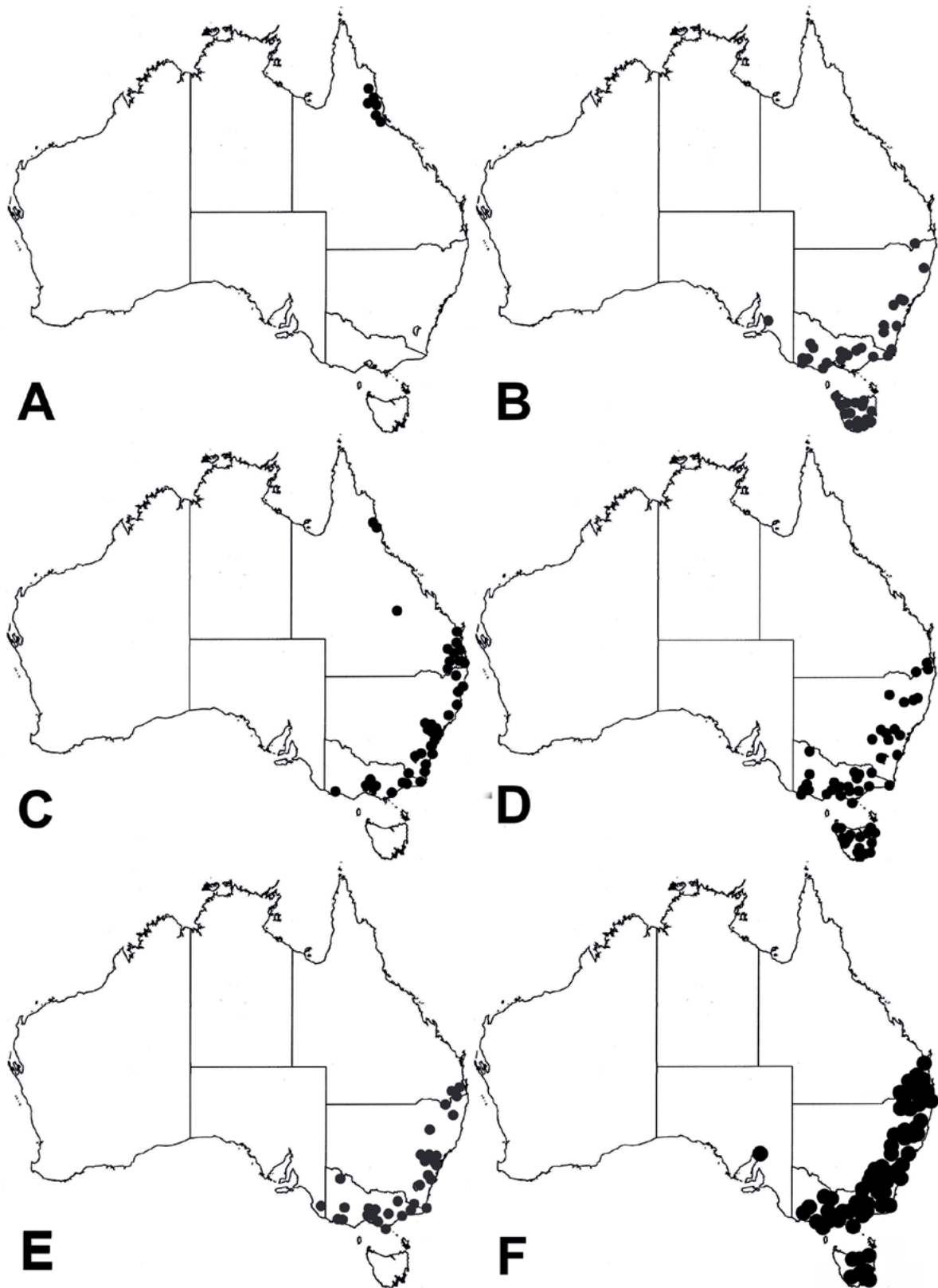


Figure 12. Species distribution maps: A, *Lasioglossum* (*Australictus*) *davide*; B, *Lasioglossum* (*Australictus*) *lithusca*; C, *Lasioglossum* (*Australictus*) *peraustrale*; D, *Lasioglossum* (*Australictus*) *plorator*; E, *Lasioglossum* (*Australictus*) *tertium*; F, *Lasioglossum* (*Chilalictus*) *orbatum*.

Mesosoma: (fig. 6A) mesoscutum anterior mesial margin weakly produced mesoanteriorly, surface dull, with minute microtessellate pattern, medially openly to closely punctate, laterad of parapsidal areas open to sparsely punctate, in parapsidal areas densely punctate, densely punctate along posterior margin; scutellum 2 x longer than dorsal surface of metapostnotum, scutellum smooth, shining, openly to sparsely punctate; dorsal surface of metapostnotum acarinate across posterior margin defined by crescent shaped ridge distinctly raised above vertical and lateral surfaces, dorsal surface ruguloso-striolate, sculpture reaches posterior margins, lateral margins smooth, dull with microalveolate pattern, vertical posterior surface of metapostnotum defined by lateral carinae; mesepisternum and metepisternum plicate; first recurrent vein (1m-cu) entering second submarginal cell.

Metasoma and legs: (figs. 6A-B) metasomal T1–T5 with dull sheen, appears impunctate, sparsely punctate with minute punctures; anterior metatibial spur finely serrate with distinct, small, backwardly pointing teeth.

Colour: (figs. 6A-B) head and mesosoma black, some specimens apical half of clypeus red-brown, T1–T3 red-brown, T4–T5 red-brown suffused with black; legs with fore, mid coxae, trochanters, femora black, remainder red-brown.

Vestiture: (figs. 6A-B, 6E) body sparse, clypeus and supraclypeal area glabrous, frons with sparse small, black, erect hair, paraocular area with downwardly pointing white hair, mesoscutum and scutellum appear glabrous with sparse small, black, erect hair, long, white hair on lateral, vertical posterior surface of metapostnotum, metasoma sparse, laterally with short, erect white hair.

Description of male: (figs. 6C-D) Body length: 8.95–10.08–10.21 mm (n=10); forewing length: 2.69–2.81–2.98 mm (n=10); head width: 2.35–2.61–2.69 mm (n=10); intertegular width: 1.92–2.07–2.16 mm (n=10). Relative head measurements: HW: 100, HL: 88–89, UID: 56–57, LID: 42–43, IAD: 12–13, OAD: 22–23, IOD: 16–18, OOD: 13–14, CL: 25–26, GW: 16–18, EW: 28–29, SL: 22–23, AF4/AF2+3 (24/15, 22/14) 1.57–1.60, FL: 248–252.

Differs from female as follows: upper and lower inner eye margins converging basally; median frontal carina extending just beyond antennal bases; frons sculpture densely reticulate across surface to inner margins of eyes; scape reaches basally level of median ocellus; clypeus surface shiny with weak microtessellate pattern basally, medium area weakly concave, openly punctate with shallow punctures, supraclypeal area protruding above paraocular area, bulbous, dull, with dense microtessellate sculpture, closely punctate with minute, shallow punctures; mesoscutum dull, with dense microtessellate sculpture, closely to densely punctate, scutellum and metanotum similar to mesoscutum; dorsal surface of metapostnotum same as in female, acarinate, dorsal surface defined by raised ridge, dorsal surface coarsely ruguloso-striolate; colour similar to female except apical two thirds of clypeus pale yellow, metasoma colour ranges from T1–T3 red-brown, T4–T6 red-brown suffused with black, or T1 almost black, T2–T3 red-brown with median black band, T4–T6 almost black.

Vestiture: lower half of frons, between antennal bases and paraocular area with dense, erect, white hair, gena with dense

beard of long, plumose, white hair, mesoscutum with sparse, short, erect, brown hair, metapostnotum lateral sides with short, white, adpressed hair, apical posterior vertical posterior surface of metapostnotum glabrous, metasomal sterna S1–S4 with sparse white, adpressed hair, S5 lateral margins with distinct white, semi-erect hair tufts (fig. 6F).

Genitalia: (figs. 10C, 10D) gonobase sides narrowed basally, complete ventroapically, gonobase width almost half of gonocoxa width, gonocoxa glabrous ventrally and dorsally, dorsal inner margins of gonocoxa basally rounded, gonocoxa apical inner margin not produced, continues contours of gonostylus, glabrous; retrorse lobes large, meeting at midline, membranous, inwardly pointing, outer margins of retrorse lobes glabrous, inner margins basally with erect, large setae, apically with short adpressed, erect setae; gonostylus small (about one third length of gonocoxa), erect, apically rounded, with simple, erect hair; penis valves curved apically, with short dense hair dorsolaterally.

Distribution: (fig. 12B) this species occurs from SE Queensland, down New South Wales coast, across Victoria, throughout Tasmania and one South Australian record. It has been recorded from sea level (Portland 7.23 m) up to high elevations in Victoria (Mt Hotham 1,861 m) and Tasmania (Mt Wellington 1,271 m).

Remarks: Australian Halictidae species now in the genus *Lasioglossum* were originally placed in either *Halictus* Latreille 1804 or *Parasphecodes*, and most original species names ended with “us” or “a”. Michener’s (1965) revision of the Australian bee fauna recombined these species into the genus *Lasioglossum*. In accordance with ICZN rules (Articles 31 and 34), Michener changed species name endings to agree with the gender of *Lasioglossum* and endings with “us” or “a” were changed to “um”. Therefore, Michener 1965 changed *Parasphecodes lithusca* to *Lasioglossum (Parasphecodes) lithuscum*.

John Ascher (pers. comm.) argued that some of these names should not have been changed. John reasoned that 12 of Smith’s (1853) new species names were partial anagrams of the word “Halictus”, meaning these species names should be treated as nouns in apposition rather than adjectival and therefore should not have been changed in Michener’s (1965) revision. Accordingly, Michener’s (1965) *L. (Parasphecodes) lithuscum* name has been reverted to Smith’s (1853) original species name of *L. (Australictus) lithusca*.

Cockerell (1914: 46) commented that *Parasphecodes wellingtoni* was close to *Parasphecodes lithusca* but differed in leg colour; that colour difference is within the known colour range. Cockerell (1929: 11) commented that *Parasphecodes wellingtoni griseipennis* was “typical” of *Parasphecodes wellingtoni* but that species occurred in Tasmania, whereas the new subspecies “*griseipennis*” occurred in New South Wales. *Lasioglossum (Australictus) lithusca* is now recorded from SE Queensland across to South Australia, including Tasmania. Several female specimens carried deutonymphal *Anoetus* Dujardin 1842 (Sarcoptiformes: Astigmatina: Histiostomatidae) hypopial mites apically across T1, though one specimen had several mites on the right forewing. No acarinarium was present on T1, but this area has a moderate cover of erect setae. See Walter et al. (2002) for full discussion of mites on bees.

Rayment identified a specimen as this species, his handwritten label reading “Bolgart WA, 12 Jan 1950”. This is the only specimen of this species and the entire subgenus recorded from Western Australia. I consider it to be an incorrect labelling, because Rayment also collected and labelled, in his handwriting, specimens of *L. lithusca* at Gorae West, Victoria on 10 Jan 1950. I have not included Rayment’s WA specimens in the “Other Material Examined” or on the species distribution map.

Although this species was originally described in *Parasphecodes* by Smith (1853) and placed in *Lasioglossum* (*Parasphecodes*) by Michener (1965), it is better placed in *Lasioglossum* (*Australictus*) due to the presence of all the *Australictus* subgeneric diagnostic characters, especially the elongated and enlarged preapical tooth on the mandible, finely serrate anterior metatibial spur, shape of labrum and male genitalia characters.

Lasioglossum (*Australictus*) *peraustrale* (Cockerell)

(Figs. 2C, 7A–F, 10E, 10F, 12C)

Halictus peraustralis Cockerell 1904: 211.

Halictus odyneroides Rayment 1939: 279. **syn. nov.**

Lasioglossum (*Australictus*) *peraustrale* – Michener 1965: 165.

Lasioglossum (*Australictus*) *odyneroides* – Michener 1965: 165.

Material examined: Holotype of *peraustralis* ♀, South Australia. “bicingulatus var. Smith” F. Sm. Coll. 79.22 BMNH Hym.17.a.693 (BMNH) (view type data and image at: <https://data.nhm.ac.uk/object/c23639db-a1d1-40e5-886a-ef654e4d3c8f> accessed 16 August 2022).

Holotype of *odyneroides* ♀, New South Wales, White Swamp, Macpherson Range, May 1939, J. Hardcastle. (ANIC).

Other specimens examined (219♀, 47♂): QUEENSLAND: (11♀) Kuranda, Black Mountain Road, 3 Oct 2005, K. Walker, on *Lophostemon grandifloris* (NMV); (1♀) Cairns dist. F.P. Dodd (QM); (34♀) Brisbane, 4 Jul 1914, 1 Sept 1914, 24 Sept 1914, 29 Sept 1914, 2 Feb 1918, 13 Mar 1918, 12 Feb 1918, 6 Mar 1918, H. Hacker (QM); (1♀) Mt Moffat Nat Pk, Kenniff Cave, 840 m, 22 Nov 1995, C. Burwell (QM); (5♀) Stradbroke Is., 3 Dec 1912, 7 Sept 1914, 17 Sept 1915, H. Hacker (QM); (1♀) Birkdale, 13 Mar 1918, H. Hacker (QM); (2♂) Cairns district, F.P. Dodd (SAM); (2♂) Upper Cedar Creek via Samford, 21 Nov 1965, B. Cantrell (QM); (3♂) Cedar Ck, 21 Nov 1965, T. Weir (QM); (1♂) Brisbane, 17 Apr 1955, J. Kerr (NMV); (2♂) 5 km N Karara, 6 Jan 1984, K. Walker on *Eucalyptus* (NMV); (1♂) Murphy’s Creek, 30 Nov 1988, K. Walker, on *Eucalyptus* (NMV); (2♀, 1♂) Leslie Dam, 13 km W Warwick, 13 Nov 1978, K. Walker, on *Eucalyptus* (QM); (1♂) Broken R, Eugella, 16–17 Nov 1992, 750 m, Monteith, Thompson, Cook & Janetzki (QM); (1♀, 3♂) 3 mi Cunningham’s Gap, 25 Feb 1959, C.D. Michener on *Bursaria spinosa* (SEM); (1♂) Tambourine, 18 Dec 1958, C.D. Michener (SEM); (1♀) Tambourine, 1923, W.H. Davidson (QM); (2♀) Amiens, 4 Nov 1965, J.C. Cardale (QM); (1♀) Severnlea via Stanthorpe, 10 Dec 1980, E.M. Exley & J. King on *Leptospermum* (QM); (2♀) 11 km S Cunningham’s Gap, 12 Nov 1980, J. & C. King, on *Bursaria spinosa* (QM); (1♀) Lucas Heights, 5 Nov 1995, A. Sundholm, on *Leptospermum polygalifolium* (QM); (2♀) Springbrook, 12 Feb 1943, A.J. Turner (QM); (2♀) 8 mi N of Landsborough, 28 Oct 1965, J.C. Cardale (QM); (1♀) Capalaba, 23 Sept 1961, R. Shepard (QM); (2♀) Burleigh, 28 Sept 1958, A.N. Burns (NMV); (1♀) 13 mi N Stanthorpe, 29 Dec 1958, C.D. Michener (SEM).

NEW SOUTH WALES & AUSTRALIAN CAPITAL TERRITORY: (23♀) In rotten log, Bankstown nr Sydney, 30 June 1984,

B.J. Day (AM); (33♀, 1♂) Bilpin Blue Mtns, 11 Mar 1981, 28 Feb 1986, 10 Sept 1979, 14 Nov 1977, 22 Sept 1977, 19 Apr 1978, 21 Nov 1978, 2 Oct 1978, N.W. Rodd (AM); (1♀) Kurrajong Heights, 27 Feb 1978 (AM); (1♀) Woronara, 12 Jan 1982, M.L. Mason (AM); (4♂) Castle Flat, Clyde R, 4.5 km W Pigeon House, 8 Jan 1984, L. Hill, ex cluster c. 150 on twigs (AM); (1♂) Liston, 23 Dec 1969, J.C. Cardale, on *Eucalyptus* (ANIC); (1♀) National Park, 23 Dec 1906, C. Gibbons (AM); (1♀) Patonga, 25 Nov 1945 (AM); (33♀, 2♂) Cheltenham, 22 Oct 1949, 1 Apr 1950 (AM); (1♀) Approx. 1 km S Kew, 23 Dec 1981, G. & T. Williams, on *Leptospermum* blossoms (AM); (1♂) Brunswick Heads, 12 Jan 1938, E.F. Riek (ANIC); (1♂) Hornsby, C. Gibbons (AM); (9♀, 1♂) Nadgee Reserve, 7 km S of Newton’s Beach, 21 Dec 1985, E.A. Sugden (AM); (1♂) Gosford, 13 Mar 1932, A.J. Turner (QM); (1♀) Mountain Lagoon, Blue Mtns, 23 Nov 1977, N.W. Rodd (AM); (4♀) Sydney, W.W. Froggatt (ANIC); (1♀) Pearl Beach, near Woy Woy, 9–11 Dec 1988, M.J. Fletcher & J.A. MacDonald (OIA); (1♀) nr Glenbrook Ck, Blue Mtns, 23 Dec 1998, G.R. Brown (OIA); (1♀) Lane Cove, 26 Sept 1987, S.G. Hunter (OIA); (1♀) Georges River, nr Lugarno, 16 Apr 1941, A. Holmes (AM); (1♀) Barrington House via Salisbury, 25–28 May 1963, A. Macqueen (QM); (3♀) State Forest Gibraltar Range, 29 Dec 1969, C.W. Frazier (ANIC); (1♀) Nelligen, 3 Nov 1949, Cane & Gemmell (ANIC); (1♀) Jervis Bay, 7 Nov 1956, E.F. Riek (ANIC); (1♀) 2.7 km NE Queanbeyan, 670 m, 16 Dec 1979, I.F.B. Common (ANIC); (1♀) 3 km N Lansdowne, nr Taree, 3 Jan 1992, G. Williams on *Tristaniopsis laurina* blossoms (NMV); (2♀) Royal National Park, 28 Dec 1970, D.K. McApline (AM); (1♀) Black Mountain, 15 Jan 1934, F.J. Gray (ANIC); (2♀) Wisemans Ferry, 18 Dec 1927, A.N. Burns (NMV); (1♀) Buchan, 26 Jan 1937, A.N. Burns (NMV); (1♀) Mt Wilson, 4 Jan 1931, A.N. Burns (NMV); (1♀) Wattle Flat, W.W. Froggatt (ANIC).

VICTORIA: (2♀, 1♂) N of Lakes Entrance, Colquhoun State Forest, 21 Feb 1985, 6 Feb 1987, K. Walker, on *Eucalyptus* (NMV); (6♂) 9 km N Bruthen, 8 Feb 1992, G. Daniels & C. Burwell (QM); (3♀) Coranderrk, 16 Nov 1984, P. Bernhardt on *Acacia mearnsii* (NMV); (2♀) Woori Yallock, 23 Nov 1930, A.N. Burns (NMV); (4♀) Tambo Crossing, Jan 1935, F.E. Wilson (NMV).

Floral record: Families visited: 3 (Fabaceae (1), Myrtaceae (10), Pittosporaceae (2)). Genera visited: 6 (*Acacia* (1), *Bursaria* (2), *Eucalyptus* (4), *Lophostemon* (1), *Leptospermum* (2), *Tristaniopsis* (1)).

Flight phenology capture records: Jan (27) Feb (14) Mar (7) Apr (3) May (1) June (0) July (0) Aug (1) Sept (0) Oct (17) Nov (13) Dec (14).

Diagnosis. *Lasioglossum* (*Australictus*) *peraustrale* is most like *L. (Australictus) tertium* with pronotum and metasomal tomentous yellow hair bands. This species can be distinguished in both sexes from other *Australictus* species by black body colour; tomentum on pronotum, posterolateral corners of mesoscutum, metanotum and metasomal bands on T2–T3; dorsal surface of metapostnotum posterior margin acarinate but elevated above surrounding lateral and vertical surfaces; metapostnotum dorsal surface sculpture microalveolate; metapostnotum vertical surface with V-shaped patch of white tomentum (weak in female and dense in male) (figs. 2C, 7A–D); male genitalia with gonobase narrowed basally, large retrorse lobes and gonostylus absent (absent gonostylus is shared with *L. tertium* only; figs. 10E, 10F, 11C, 11D); and metasomal sternal S5 lateral margins with weak, white, semi-erect hair tufts (fig. 7F). This species occurs in North Queensland but is primarily found in SE Australia, and is absent from Tasmania (fig. 12C).

Description of female: (figs. 7A, 7B, 7E) body length: 8.32–9.59–10.05 mm (n=10); forewing length: 2.35–2.89–3.07 mm

($n=10$); head width: 2.54–2.76–2.83 mm ($n=10$); intertegular width: 1.68–1.83–1.92 mm ($n=10$). Relative head measurements: HW: 100, HL: 80–81, UID: 58–59, LID: 56–57, IAD: 09–10, OAD: 21–22, IOD: 12–13, OOD: 16–17, CL: 21–22, GW: 20–21, EW: 23–25, SL: 41–42, FL: 62–65.

Head: (fig. 7E) distance between inner upper and lower inner eye margins almost parallel; median frontal carina reaching about half way to median ocellus; clypeus smooth, polished with minute microtessellate sculpture, medially flattened, closely to sparsely punctate with shallow, rounded punctures, medially several punctures; supraclypeal area slightly raised above paraocular area, surface with dull sheen, with weak microtessellate pattern, open to closely punctate with shallow punctures; frons dull, with dense reticulate punctures which extend to inner margins of eye, paraocular area shining, close to densely punctate.

Mesosoma: (fig. 7A) mesoscutum anterior mesial margin rounded, continuing lateral contour, surface with dull sheen, with dense punctures, many punctures fused; scutellum 1.35 x longer than dorsal surface of metapostnotum, scutellum dull, with densely punctate sculpture; dorsal surface of metapostnotum acarinate across posterior margin but defined by V-shaped ridge, distinctly raised above vertical and lateral surfaces, dorsal surface microalveolate but with several weak rugulose striae basally, striae not reaching mid-point of dorsal surface, dorsal surface pattern forming V-shape onto vertical posterior surface, lateral margins smooth, dull with microalveolate pattern, with some large, shallow punctures, vertical posterior surface of metapostnotum microalveolate with carinae extending basal one third of length; mesepisternum and metepisternum plicate; first recurrent vein (1m-cu) interstitial with or entering second submarginal cell.

Metasoma and legs: (figs. 7A–B) metasomal T1–T5 with dull sheen, densely punctate across entire surfaces; anterior metatibial spur finely serrate to smooth.

Colour: (figs. 7A, 7B, 7E) body black except: apical two thirds of clypeus, lower paraocular area, antennae red-brown, T4–T5 red-brown, coxa, trochanter dark brown to black, remainder of legs red-brown; coloured dense patches of vestiture as follows: dense white vestiture around spiracle, yellow to orange on pronotum corners, lateral corners of mesoscutum, mesial of metanotum, dense tomentum basally across T2–T3, T3 tomentum thicker than tomentum on T2, T4–T5 brown; forewing with brown tinge from submarginal cells to tip of wing.

Vestiture: (figs. 7A, 7B, 7E) body vestiture sparse, clypeus with sparse simple hair, supraclypeal area almost glabrous, frons with sparse, small, black, erect hair, paraocular area with downwardly pointing adpressed, white branched hair, mesoscutum, scutellum almost glabrous but with tomentum on posterolateral corners of mesoscutum, metanotum, basally on T2–T3, sparse small, black, erect hair, long, white hair on lateral, vertical posterior surface of metapostnotum, except for tomentum bands, metasomal terga appears glabrous but with sparse, short, adpressed hair.

Description of male: (figs. 2C, 7C, 7D) body length: 8.01–9.25–9.42 mm ($n=10$); forewing length: 2.50–2.54–2.59 mm ($n=10$); head width: 2.06–2.33–2.40 mm ($n=10$); intertegular width: 1.82–

1.85–1.87 mm ($n=10$). Relative head measurements: HW: 100, HL: 90–92, UID: 57–58, LID: 42–43, IAD: 16–17, OAD: 23–24, IOD: 15–16, OOD: 16–17, CL: 26–27, GW: 15–16, EW: 29–30, SL: 22–23, AF4/AF2+3 (23/15, 22/14) 1.53–1.57, FL: 215–220.

Differs from female as follows: upper and lower inner eye margins converging basally; median frontal carina extending about one third to two thirds to medium ocellus; frons sculpture densely reticulate-punctate across surface to inner margins of eyes; scape reaches level of median ocellus; clypeus surface polished, shiny, weakly convex, openly punctate with shallow punctures; supraclypeal area weakly protruding above paraocular area, rounded, polished, closely punctate with minute, shallow punctures with microalveolate sculpture; mesoscutum as in female, dull, densely punctate appearing as coarse reticulate sculpture, scutellum, metanotum similar to mesoscutum; dorsal surface of metapostnotum same as in female though reticulation more extensive, acarinate, dorsal surface defined by raised, rounded ridge, dorsal surface with microtessellate sculpture but without weak striae basally; colour similar to female except apical two thirds of clypeus pale yellow, with similar yellow-orange vestiture except V-shaped tomentum on upper vertical posterior surface of metapostnotum (fig. 2C), T3 basal tomentum much broader than basal tomentum on T2.

Vestiture: lower half of frons, between antennal bases, paraocular area with dense erect, white hair, gena with moderate beard of long, plumose, white hair, mesoscutum appears glabrous but with sparse, short, erect, brown hair, metapostnotum lateral sides with short, white, adpressed hair, apical vertical posterior surface of metapostnotum with V-shaped tomentum of white hair (fig. 2C), metasomal sterna S1–S4 with sparse white, adpressed hair, S5 lateral margins with weak white, semi-erect hair tufts (fig. 7F).

Genitalia: (figs. 10E–F) gonobase sides narrowed basally, complete ventroapically, gonobase width almost half of gonocoxa width, gonocoxa with single seta dorsolaterally, remainder glabrous, dorsal inner margins of gonocoxa basally rounded, gonocoxa apical inner margin not produced, continues contours of gonostylus, glabrous; retrorse lobes large, meeting at midline, membranous inwardly pointing, outer margins of retrorse lobes with small, erect setae, inner margins of retrorse lobes basally with area of erect, large setae, apically with fine, short adpressed, some larger erect setae; gonostylus absent but area with simple, erect hair; penis valves curved apically, with short dense cover of hair dorsolaterally.

Distribution: (fig. 12C) this species extends from north Queensland (Cairns), down eastern New South Wales and across Victoria, but is absent from Tasmania. The type locality of *Halictus peraustralis* is South Australia, but no location was named so the South Australian record has not been mapped.

Remarks: Cockerell's (1904) description of "*Halictus peraustralis*" was unusual as the species description was part of a dichotomous key to "*Halictus* specimens in the British Museum", with the species description of "*Halictus peraustralis*" as part of couplet one. Cockerell noted (1904: 211) that the specimen used for the species description (Type) was originally labelled by F. Smith as a variety of "*Halictus bicingulatus* var Smith". Note that

Michener (1965) placed “*bicingulatus*” in the *Lasioglossum* subgenus *Chilalictus*, but Cockerell recognised the variety as a valid species. Rayment (1939) commented that his new species “*odyneroides*” belonged to the “*bicingulatus*” group and that it was closest to “*H. peraustralis*”, but he distinguished it as a new species due to a minor colour variation. This colouration is recognised within *L. peraustrale*. The colour patterns of *L. peraustrale* are best described as mimetic, because they are replicated in a range of species in *Lasioglossum* subgenera.

Lasioglossum (Australictus) plorator (Cockerell)

(Figs. 2F, 3A–F, 4, 8A–F, 11A, 11B, 12D)

Halictus plorator Cockerell 1910b: 274; Rayment 1953: 29.

Lasioglossum (Australictus) plorator – Michener 1965: 165.

Material examined: Holotype of *plorator* ♀, Victoria Melbourne Aug 1900, C.F. Turner Collection 1900-7 C.7. 8.00 BMNH Hym.17.a.633 (BMNH) (view type data and image at <https://data.nhm.ac.uk/object/9154124c-377b-4ea6-8421-90965bbc6284> accessed 16 August 2022).

Other specimens examined (248♀, 159♂): QUEENSLAND: (1♀) Beechmont, 3 Oct 1984, N.W. Rodd (AM); (2♀) Wyberba National Park, 8 Jan 1967 Houston, T.F. on *Eucalyptus* (WAM).

NEW SOUTH WALES & AUSTRALIAN CAPITAL TERRITORY: (5♀) Blue Mtns, 26 Sept 1978, N.W. Rodd (AM); (2♀, 1♂) Tianjara Falls, 60 km SW Tomerong, 5 Feb 1988, N.W. Rodd (AM); (1♀) Orange, Jan 1934 (ANIC); (2♀, 1♂) 3 km S Mt Wilson, Blue Mtns, 12 Sept 1978, N.W. Rodd (AM); (1♂) Narrow Neck, Blue Mtns, 27 March 1979, N.W. Rodd (AM); (1♀) Mt Victoria, Blue Mtns, 29 Dec 1981, N.W. Rodd (AM); (2♂) 6 km NE Bilpin, Blue Mtns, 4 March 1986, N.W. Rodd (AM); (3♀, 1♂) Mt Tomah, Blue Mtns, 9 Feb 1986, N.W. Rodd (AM); (1♀, 1♂) Mt York, Blue Mtns, 29 Jan 1982, N.W. Rodd (AM); (1♀, 1♂) Haystack Ridge, 26 Feb 1979, N.W. Rodd (AM); (1♀, 1♂) 3 km S Mt Wilson, Blue Mtns, 13 Jan 1986, N.W. Rodd (AM); (1♀, 1♂) Mt Tomah, 25 Jan 1979, N.M. Rodd (AM); (1♀, 1♂) Nadgee Reserve, 7 km S Newton Beach, 29 Dec 1985, E.A. Sugden, sweeping *Kunzea ercoides* (AM); (2♀) 8 km W Tyalgum, 24 Sept 1983, N.W. Rodd (AM); (2♀) Mt Kaputar Nat. Park, 1362 m, 5 Dec 1974, I.F.B. Common & G.E.D. Edwards (ANIC); (4♀) Dawson's Spring, Mt Kaputar Nat. Pk, 30 Nov – 10 Dec 1978, G.R. Brown (OIA); (1♀) Armidale, 18 Nov 1959, C.W. Frazier (ANIC); (5♀) NE Nat. Pk, 4 Nov 1960, C.W. Frazier (ANIC); (9♀) Blundell's, 18 Feb 1931, L.F. Graham (ANIC); (1♀) Blundell's, 18 Feb 1950, E.F. Riek (ANIC); (1♂) Mt Wilson, 4 Jan 1931, A.N. Burns (NMV); (2♀) Winburndale, 12 mi E Bathurst, 6 Dec 1974 (ANIC); (2♀) Picadilly Circus, Brindabella Ra., 1 Nov 1988, R.R. Snelling & J. Grey #88 (LACM); (3♀) NE Nat Pk, near Entrance, 04–20 Nov 1960, C.W. Frazier (ANIC).

VICTORIA: (3♀) Gorae West, 1951, 22 Aug 1956 (ANIC); (1♀) Pakenham, 20 Nov 1936 (ANIC); (2♀) Grampians, Oct 1928, F.E. Wilson (ANIC); (1♀) Grampians, 20 Oct 1945, A.N. Burns (NMV); (3♀) Flowerdale, 15 Dec 1954, A.N. Burns (NMV); (3♀) Flowerdale, 8 Dec 1954, Neboiss (NMV); (1♀) Melbourne, F.P. Spry 1909 (ANIC); (1♀) Erica, 20 April 1983, P. Bernhardt (NMV); (7♀) Warburton, 19 Dec 1968, E.M. Exley on *Leptospermum ericoides* (QM); (1♀) Warburton, 19 Dec 1968, E.M. Exley on *Prostanthera lasianthoe* (QM); (2♀) Portland, 6 Dec 1974, G. Knerer (NMV); (1♀) Macedon, 29 Feb 1967 (ANIC); (1♀, 5♂) Emerald, 26 July 1936, Rayment (ANIC); (1♀) 11 km Halls Gap, 21 Oct 1983, I.D. Naumann & J.C. Cardale (ANIC); (1♀) Mt Difficult, Grampians, 2 Jan 1966, B. Cantrell (QM); (2♂) Anglers Rest, 5 March 1992, K. Walker, on *Eucalyptus* (NMV); (2♀, 1♂) Reefton, 9 Feb 1955, Neboiss (NMV); (17♀) Croydon (NMV); (2♀)

Lake Hattah, 11 Apr 1920, J.E. Dixon (NMV); (1♀) San Remo, 17 Oct 1927, A.D.D. (NMV); (3♀) Hamilton, 14 Sept 1914, G.S. (NMV); (3♀) Wombargo Ck, 9 May 1947, G.B. (NMV); (1♀) Grampians, 19 Oct 1945, G.B. (NMV); (1♀) High Tap, 7 Aug 1951 (NMV); (1♀) Lorne, 3 March 1954, F.E. Wilson, burrowing in punk of rotten log (NMV); (2♀) Mt Dandenong, 2,000 ft, 21 Dec 1930, A.N. Burns (NMV); (1♀) Dromana, 3 Nov 1931, G.B. (NMV); (2♀) Warburton, 8 Sept 1959, A.N. Burns (NMV); (2♀) Ferntree Gully, 5 Dec 1915, F.P. Spry (NMV); (1♀) Nariel, 12 Feb 1963, A.N. Burns (NMV); (34♀) Cobboboonee State Forest, 1.3 km E Wright's Swarm Road, 3 March 1990, W.T. Wcislo ex *Brenesia* (SEM); (37♀) Cobboboonee State Forest, 12–13 March 1990, W.T. Wcislo, ex *Eucalyptus* (SEM); (3♀, 9♂) 22 km N Portland farm, at NW Border of Cobboboonee State Forest and Glenelg National Forest, 15 Feb 1990, W.T. Wcislo ex red *Eucalyptus* (SEM); (11♀, 14♂) Cobboboonee State Forest, 4 Feb 1997, K. Sparks and C. Mcphee on *Bursaria* (NMV); (1♀) Victoria Valley, 11 Feb 1947, B. Given (NMV); (1♀) 715 Lt Hampton Rd Glenlyon, Gayle Osborne, on *Achillea millefolium* (iNaturalist <https://www.inaturalist.org/observations/68516396>); (1♀) Wilsons Promontory, 5 Mile Beach Road, 26 Feb 1996, K. Walker, on *Eucalyptus* (NMV); (3♀) Mt Hickey, Tallarook, 14 Nov 1987, P. Carwardine (NMV).

TASMANIA: (1♀) 3 km SEE Black River, 18 Jan 1983, I.D. Naumann & J.C. Cardale (ANIC); (2♀) 11 mi E Strahan, 1 Jan 1969, E.M. Exley on *Melaleuca* (QM); (1♀) 10 mi W Upper Blessington, 29 Dec 1968, E.M. Exley, on *Leptospermum* (QM); (1♀) Tullah, 31 Dec 1968, E.M. Exley on *Leptospermum* (QM); (3♀) 1 km SSE Gladstone, 29 Jan 1983, I.D. Naumann & J.C. Cardale (ANIC); (1♀) The Lea, 6 km S Hobart, 27 Dec 1979, J.C. Cardale (ANIC); (1♀) Hobart, Lea (SAM); (2♀) Sandy Bay, 20 May 1947, A.N. Burns (NMV); (1♂) 7 km SW Buckland, 27 Jan 1983, I.D. Naumann & J.C. Cardale (ANIC); (2♀) Huon–Picton R Junction, 14 Nov 1972, A. Neboiss (NMV); (21♀) Marrawah, 30 Jan 1949, E.F. Riek (ANIC); (1♀) Mt Claude, 680m, 21 March 1990, L. Hill, on *Leptospermum* (TDA); (2♀) Lake Leake, 2000 ft, 27 Feb 1963, I.F.B. Common & M.S. Upton (ANIC); (1♀) 10 km NNW St. Helens, 14 Jan 1983, I.D. Naumann & J.C. Cardale (ANIC); (1♀) 2 km NNE Pioneer, 29 Jan 1983, I.D. Naumann & J.C. Cardale (ANIC); (2♀) Bruny I Lea (SAM); (14♀) Hastings, 15 Jan 1949, E.F. Riek (ANIC); (2♀) SW Nat. Park, Tyenna, 11 Jan 1997, A. Hingston, on *Leptospermum lanigerum* (TDA); (1♀) 4 km WSW Maydena, 11 Dec 1981, I.D. Naumann (ANIC); (2♀) Tyenna, 16 Dec 1917, C.E. Cole, (SAM); (1♀) National Park, 21 Jan 1949, E.F. Riek (ANIC); (1♀, 110♂) Florentine Valley, 20 km W Maydena, 9 Feb 1986, K. Walker, on *Leptospermum* (NMV); (1♀) Ellendale, 30 Jan 1973, R.J. Hardy (TDA); (1♀) Mount Wellington, Icehouse Track, 27 Jan 2001, K. Hergstrom (TDA); (1♀) Mt Wellington, Hobart, 8 Nov 1996, A. Hingston, on *Hakea lissosperma* (TDA); (2♀) Mt Nelson, 31 Jan 1997, A. Hingston, on *Leptospermum scoparium* (NMV); (1♀) Liffey: Fernery, 4 Dec 1993, C.P. Spencer & L. Richards (TMAG); (1♀) 6 mi SW Queenstown, 1 Jan 1969, E.M. Exley, on *Melaleuca* (QM); (1♀, 2♂) 6 km N Zeehan, 6 March 1989, K. Walker, on *Eucalyptus* (NMV); (1♀, 1♂) Cradle Mountain, 7 March 1989, K. Walker, on *Leptospermum rupestre* (NMV).

Floral record: Families visited: 4 (Asteraceae (1), Lamiaceae (1), Myrtaceae (5), Proteaceae (1)). Genera visited: 5 (*Achillea* (1), *Eucalyptus* (6), *Hakea* (1), *Kunzea* (1), *Leptospermum* (7), *Prostanthera* (1)).

Flight phenology capture records: Jan (18) Feb (14) Mar (7) Apr (3) May (2) June (0) July (1) Aug (2) Sept (4) Oct (6) Nov (8) Dec (15).

Diagnosis. *Lasioglossum (Australictus) plorator* is most like *L. (Australictus) davide* in body colour. This species can be distinguished, in both sexes, from other *Australictus* species by black body colour with bluish tinge on metasoma; lack of tomentum on mesosoma or metasoma; dorsal surface of metapostnotum posterior margin acarinate but surface elevated

above surrounding lateral, vertical surfaces; metapostnotum dorsal surface sculpture microalveolate (figs. 2F, 8A–D); male genitalia with gonobase narrowed basally, moderate sized retrorse lobes, small, erect gonostylus (figs. 11A, 11B); and metasomal sterna with erect lateral hair tufts on S4–S5 (fig. 8F). This species occurs in SE Australia, including Tasmania (fig. 12D).

Description of female: (figs. 2F, 8A, 8B) body length: 9.89–10.12–10.21 mm (n=10); forewing length: 2.97–3.05–3.12 mm (n=10); head width: 2.64–2.71–2.78 mm (n=10); intertegular width: 1.87–1.98–2.06 mm (n=10). Relative head measurements: HW: 100, HL: 82–83, UID: 60–62, LID: 59–60, IAD: 09–10, OAD: 22–23, IOD: 08–09, OOD: 17–18, CL: 20–21, GW: 20–21, EW: 20–21, SL: 43–45, FL: 70–72.

Head: (fig. 8E) upper and lower inner eye margins almost parallel; median frontal carina barely reaching above upper antennal bases; clypeus polished, smooth on apical half, remainder with microtessellate sculpture pattern giving dull sheen, surface weakly convex, openly punctate with shallow punctures, few irregular, elongate punctures apically, supraclypeal area distinctly raised above paraocular area, surface dull with microtessellate sculpture pattern, sparsely punctate with shallow punctures; frons sculpture above antennal bases densely reticulate, laterally almost smooth but plicate with weak, wavy, raised, vertical carinae extending laterally to inner margins of eyes, apically to just basally level of median ocellus, paraocular area smooth, shining, weakly plicate.

Mesosoma: (figs. 2F, 8A–B) mesoscutum anterior mesial margin weakly produced mesoanteriorly, surface smooth, with dull sheen due to weak microtessellate sculpture pattern across surface, medially open to closely punctate, laterad of parapsidal areas closely punctate, in parapsidal areas densely punctate, densely punctate along posterior margin; scutellum 1.6 x length of dorsal surface of metapostnotum, scutellum with dull sheen, with microtessellate sculpture pattern, open to closely punctate; dorsal surface of metapostnotum acarinate across posterior margin with weak carinae in posterolateral corners, dorsal surface defined by rounded, raised ridge above vertical, lateral surfaces, dorsal surface with microalveolate sculpture but with several weak striae basally, striae not reaching mid-point of dorsal surface, lateral margins smooth with microalveolate pattern, vertical posterior surface of metapostnotum defined by lateral carinae (fig. 2F); mesepisternum and metepisternum plicate; first recurrent vein (1m-cu) meeting 1rs-m vein or entering second submarginal cell.

Metasoma and legs: metasomal T1–T5 shining, smooth, sparsely punctate with minute punctures; anterior metatibial spur finely serrate, teeth barely discernible.

Colour: (figs. 8A, 8B) body black except scapes dark brown, flagella segments light brown, metasomal tergal segments black with bluish tinge, legs dark brown.

Vestiture: (figs. 8A, 8B, 8E) body vestiture sparse, clypeus, supraclypeal area almost glabrous, frons with sparse, small, black, erect hair, mesoscutum, scutellum almost glabrous but with sparse, small, black, erect hair; long hair on lateral, vertical posterior surface of metapostnotum, apical one third of T1 with some long, erect, hair, remainder of T1, T2 glabrous, T3–T4 with some black, adpressed hair apically.

Description of male: (figs. 8C, 8D) body length: 8.48–9.98–10.99 mm (n=10); forewing length: 2.64–3.08–3.12 mm (n=10); head width: 2.26–2.57–2.64 mm (n=10); intertegular width: 1.58–2.07–2.16 mm (n=10). Relative head measurements: HW: 100, HL: 83–85, UID: 60–62, LID: 47–48, IAD: 09–10, OAD: 20–21, IOD: 15–16, OOD: 16–17, CL: 27–28, GW: 19–20, EW: 28–29, SL: 19–20, AF4/AF2+3 (21/14, 22/15) 1.46–1.50, FL: 210–214.

Differs from female as follows: upper and lower inner eye margins converging basally; median frontal carina reaching about one quarter to median; frons sculpture reticulate across surface to inside inner margins of eyes; scape almost reaches level of median ocellus; clypeus smooth, shiny, with weak microtessellate pattern basally, medium area rounded, open to closely punctate; supraclypeal area protruding above paraocular area, surface dull with microtessellate sculpture covering entire surface, openly punctate; mesoscutum surface dull with reticulate, densely punctate sculpture, except anterolaterally with microtessellate sculpture, openly punctate; scutellum surface dull with reticulate, densely punctate sculpture except medially openly punctate but dull; dorsal surface of metapostnotum same as in female except V-shaped, weak striae reaching dorsolateral margin, posterolaterally weakly plicate; colour similar to female except apical two thirds of clypeus pale yellow, fore tibiae light brown and metasoma with distinct blue tinge; apical margin of T6 yellow.

Vestiture: frons with erect, black hair; between antennal bases, paraocular area with dense white semi-erect hair, gena with erect, long beard-like, white hair; mesoscutum with short, erect, brown hair, metapostnotum lateral sides with sparse, long, white, erect hair, apical posterior vertical posterior surface of metapostnotum glabrous; metasomal sterna with short erect, adpressed black setae, S4–S5 with elongate, erect lateral hair tufts (fig. 8F).

Genitalia: (figs. 11A–B) gonobase sides narrowed basally, complete ventroapically, gonobase width almost half of gonocoxa width, gonocoxa glabrous dorsally and ventrally, dorsal inner margins of gonocoxa basally broadly truncate to broadly rounded, gonocoxa apical inner margin not produced, continues contours of gonostylus, glabrous; retrorse lobes moderate in length, not meeting at midline, membranous, inwardly pointing, outer margins of retrorse lobes glabrous, inner margins of retrorse lobes with area of erect, large, inwardly pointed setae, apically retrorse lobes glabrous; gonostylus moderate sized (about one third length of gonocoxa), erect, apically rounded, sparse short setae on inner margin, dense elongate simple, erect hair on outer margin; penis valves curved apically, glabrous dorsolaterally.

Distribution: (fig. 12D) this species occurs from SE Queensland, down eastern New South Wales, across Victoria, and is widespread in Tasmania.

Remarks: Rayment (1953) described the male of *L. plorator*, from Victoria (Gorae West) and labelled the specimen an Allotype; however, this specimen has no type status. *Lasioglossum plorator* is the species found nesting in rotting wood in the Facebook posts mentioned above (figs. 3A–F, 4).

***Lasioglossum (Australictus) tertium* (Dalla Torre)**

(Figs. 1A, 2B, 9A–F, 11C, 11D, 12E)

Halictus rufipes Smith 1853: 56. [junior primary homonym of *Halictus rufipes* Fabricius, 1793]*Halictus tertius* Dalla Torre 1896: 86. [nom. nov. for *Halictus rufipes* Smith, 1853]*Parasphecodes insculptus* Cockerell 1918: 118. **syn nov.***Parasphecodes rufitarsus* Rayment 1929: 127. **syn nov.***Lasioglossum (Australictus) fulvofasciae* Michener 1965: 310. **syn nov.***Lasioglossum (Australictus) tertium* – Michener 1965: 165.*Lasioglossum (Australictus) insculptum* – Michener 1965: 165.*Lasioglossum (Australictus) rufitarsus* – Michener 1965: 165.*Lasioglossum (Australictus) fulvofasciae* – Michener 1965: 165.

Material examined: Holotype of *rufipes* ♀, label reads “Melb N.H. F. Sm. Coll. 79.22” = Australia, Victoria, Melbourne (has additional label as: *Halictus rufipes* Sm Type = *tertius* D.T. Det. Michener 1960) BMNH Hym.17.a. 2837 (BMNH) (view type data and image at <https://data.nhm.ac.uk/object/68143dfc-d0b8-474d-af44-71aacdecbb776> accessed 16 August 2022).

Holotype of *insculptus* ♀, Queensland, Tamborine Mountain, 28 Dec 1911, H. Hacker (190) Hy/4142 (QM). Note the holotype of *insculptus* has a Cockerell handwritten label designating this specimen as the type. Associated with the Holotype are two specimens with the same locality data, one female and one male. Neither specimen carries Cockerell’s handwritten label; they are not mentioned in the original description and have no type status.

Holotype of *rufitarsus* ♀, Victoria, Cann River, Nov 1928, J. Clark. T-11864 (NMV) (view type data at <https://collections.museumsvictoria.com.au/specimens/1018349> accessed 16 August 2022).

Holotype of *fulvofasciae* ♂, Queensland, 3 mi W Cunningham’s Gap, 25 Feb 1959, C.D. Michener, on *Bursaria spinosa* T-6910 (QM). Allotype ♀, same data as Holotype except has an additional label of “375”. T-6911 (QM). The Holotype locality label is printed, while the allotype locality label is handwritten by Michener.

Other specimens examined (23♀, 51♂): QUEENSLAND: (1♀) Mt Lindesay, 25 Sept 1967, T.F. Houston, 87/450 (WAM); (20♂) 3 mi W Cunningham’s Gap, 25 Feb 1959, C.D. Michener, on *Bursaria spinosa* (SEM); (1♀) Bald Mt area, 3–4000 ft via Emu Vale, 17–22 May 1980, G.B. Monteith (QM); (1♂) 13 mi N Stanthorpe, 29 Dec 1958, C.D. Michener (SEM); (3♂) Barney Ck, 7 Mar 1965, S.R. Curtis (QM).

NEW SOUTH WALES: (1♂) Nadgee State Forest, 7 km S of Newton’s Beach, 7 Dec 1985, E.A. Sugden (AM); (2♂) Cheltenham, 12 Feb 1950 (AM); (2♀, 9♂) 6 km NE Bilpin, Blue Mtns, 13 Dec 1984, 28 Feb, 4 Mar 1986, N.W. Rodd (one pair labelled “in cop”) (AM); (1♂) Haystack Ridge, nr Mt Tomah, 29 Mar 1978, N.W. Rodd (AM); (1♀) Dunns Swamp, nr Kandos, 13 Nov 1982, N.W. Rodd (AM); (2♂) 7 km NE Bilpin nr Kurrajong, 17 Mar 1981, N.W. Rodd (NMV); (1♂) Murray Beach, Jervis Bay, 18 Feb 1987, N.W. Rodd (AM); (1♂) Narrow Neck, Blue Mtns, 21 Mar 1979, N.W. Rodd (AM); (1♂) Tianjara Falls, 60 km SW Tomerong, 5 Feb 1988, N.W. Rodd (AM); (1♂) 3 km S Mt Wilson, Blue Mtns, 9 Mar 1978, N.W. Rodd (AM); (1♀) Mt White, 23 Sept 1995, A. Sundholm, on *Leptospermum* (QM); (1♀) Mt Wilson, 4 Jan 1931, A.N. Burns (NMV); (2♀) Wisemans Ferry, 18 Dec 1927, G.B. (NMV); (1♀) Gibraltar Range, 29 Dec 1969, C.W. Frazier (ANIC); (1♀) Dawson’s Spring, 1420m, Mt Kaputar Nat. Park, 1–10 Dec 1987, G.R. Brown (OIA).

VICTORIA: (3♀, 4♂) N of Lakes Entrance, Colquhoun State Forest, 21 Feb 1985, K. Walker, on *Eucalyptus* (NMV); (1♂) LaTrobe Survey, Tanjil Junction (NMV); (1♂) Wilson’s Promontory, 5 Mile Beach Road, 26 Feb 1996, K. Walker, on *Eucalyptus* (NMV); (1♂)

Anglers Rest, 5 March 1992, K. Walker, on *Eucalyptus* (NMV); (1♂) Cobboboonee State Forest, 3 Feb 1997, K. Sparks & C. McPhee, on *Bursaria* (NMV); (1♂) 22 km N Portland, Cobboboonee State Forest, 15 Feb 1990, W.C. Wcislo (SEM); (4♀) Warburton, 2 Dec 1918, Mar 1920, F.P. Spry (NMV); (2♀) Lake Hattah, Jan 1920, J. Dixon (NMV); (1♀) Mittagong, 17 Dec 1947, G.M. Goldfinch (NMV); (1♀) 35 km N Cann River, 3 Nov 1988, R.R. Snelling & J. Grey (LACM); (1♀) 8 km S Cann River, 5 Feb 1987, K. Walker & C. McPhee, on *Eucalyptus* (NMV); (1♀) Freestone Creek Rd, Moornapa, M. Smith (iNaturalist – <https://www.inaturalist.org/observations/26301693>); (1♀) 115 Cranbourne–Frankston Rd, Langwarrin (iNaturalist – <https://www.inaturalist.org/observations/25985414>); (1♀) Yan Yean, 19 Nov 1999, Walker & Danforth (Cornell); (1♀) 42 Reserve Rd, Wonga Park (iNaturalist – <https://www.inaturalist.org/observations/25749227>); (1♀) Edgar Track, Montrose, R. Richter (iNaturalist – <https://www.inaturalist.org/observations/25719040>); (1♀) Rocklands–Cherry pool Rd, Rocklands, R. Richter (iNaturalist – <https://www.inaturalist.org/observations/25735753>).

SOUTH AUSTRALIA: (1♀) Nangwarry, 09 Nov 2014, R. Leijs, on *Leptospermum* (BDBSA).

Floral record: Families Visited: 2 (Myrtaceae (5), Pittosporaceae (2)). Genera Visited: 3 (*Bursaria* (2), *Eucalyptus* (3), *Leptospermum* (2)).

Flight phenology capture records: Jan (1) Feb (9) Mar (7) Apr (0) May (1) June (0) July (0) Aug (0) Sept (2) Oct (0) Nov (4) Dec (8).

Diagnosis. *Lasioglossum (Australictus) tertium* is most like *L. (Australictus) peraustrale* with yellow tomentum on pronotum and metasomal hair bands. This species can be distinguished, in both sexes, from other *Australictus* species by: black body colour (except some males in the SE Queensland area with light coloured banded metasomal tergal segments (fig. 2D)); dense, yellow tomentum on pronotum lateral corners, vestiges of yellow tomentum on posterolateral corners of mesoscutum, none on metanotum but with metasomal bands on T2–T3; dorsal surface of metapostnotum posterior margin carinate; metapostnotum dorsal surface sculpture microalveolate (figs. 9A–D); male genitalia with gonobase widened basally (a character shared with *L. davide*), small retrorse lobes, gonostylus absent (figs. 10E, 10F); and metasomal sternal S3–S5 with erect, lateral hair tufts, more so on S4 and even more so on S5 (fig. 9F). This species occurs in SE Australia but is absent from Tasmania (fig. 12E).

Description of female: (figs. 1A, 9A, 9B) body length: 8.79–10.37–10.83 mm (n=10); forewing length: 2.50–2.79–2.83 mm (n=10); head width: 2.64–3.06–3.17 mm (n=10); intertegular width: 1.78–1.85–1.87 mm (n=10). Relative head measurements: HW: 100, HL: 74–75, UID: 55–56, LID: 64–65, IAD: 10–11, OAD: 20–21, IOD: 11–12, OOD: 16–17, CL: 16–17, GW: 24–25, EW: 23–24, SL: 41–42, FL: 65–66.

Head: (fig. 1A) upper and lower inner eye margins diverging basally (head widened basally); median frontal carina reaching about one third way to median ocellus; clypeus smooth, polished, medially flattened, open to closely punctate with small, shallow, rounded punctures except densely punctate along apical margin; supraclypeal area not distinctly raised above paraocular area, surface flat, smooth, polished, open to closely punctate with shallow punctures; frons smooth, polished, above antennal bases half way to inner margins of eyes closely to densely punctate, along inner

eye margins closely to densely punctate with minute punctures with smaller diameters than punctures above antennal bases, paraocular area smooth, shining, close to densely punctate; gena enlarged (fig. 9B).

Mesosoma: (figs. 9A, 9B) mesoscutum anterior mesial margin produced forward over pronotum, surface smooth, polished with dull sheen, medially open to closely punctate, laterad of parapsidal lines closely punctate, anterolaterally, in parapsidal areas densely punctate; scutellum 0.81 x shorter than length of dorsal surface of metapostnotum, scutellum smooth, polished, long midline densely punctate, laterally sparse to openly punctate; dorsal surface of metapostnotum carinate posterolaterally only, dorsal margin not defined by raised ridge, dorsal surface covered with microalveolate sculpture but with several weak striae, striae just reaching mid-point of dorsal surface, dorsal surface pattern forming rounded V-shape pattern onto vertical posterior surface, lateral margins smooth, dull with microalveolate pattern, vertical posterior surface of metapostnotum with carinae extending to dorsal posterolateral carinae; mesepisternum and metepisternum plicate; first recurrent vein (1m-cu) entering third submarginal cell.

Metasoma and legs: (figs. 9A, 9B). metasomal T1–T5 with dull sheen, densely punctate across entire surfaces; anterior metatibial spur finely serrate to smooth (fig. 2B).

Colour: (figs. 1A, 9A, 9B) frons, supraclypeal area, apical one third of clypeus, mesoscutum, scutellum black suffused with dark blue tinge, in some specimens basal two thirds of clypeus red-brown, in other specimens entire clypeus dark brown, metanotum, dorsal surface of metapostnotum black suffused with blue tinge, metasomal T1–T5 black, in some specimens terga suffused with brown tinge, in some specimens T4–T5 light red-brown coxa, trochanter, basal two thirds of femur dark brown, remainder of legs light red-brown; tegula light red-brown, forewing with brown tinge from submarginal cells to tip of wing; pronotum dorsolateral corners, basal margin of T2–T3 with dense yellow tomentum.

Vestiture: (figs. 1A, 9A, 9B) body vestiture sparse, frons, clypeus, supraclypeal area, paraocular area with sparse, erect hair, pronotum dorsolateral margins with dense tomentum, mesoscutum scutellum almost glabrous with sparse cover of small, black, erect hair, in some specimens posterolateral corners of mesoscutum with weak, yellow tomentum or hair tufts, in other specimens, perhaps worn, with no tomentum or hair tufts, lateral surfaces of metapostnotum with long, black hair; metasoma terga appears glabrous but with dense cover of short, adpressed hair.

Description of male: (figs. 2D, 9C, 9D) body length: 8.63–9.87–10.21 mm (n=10); forewing length: 2.31–2.62–2.68 mm (n=10); head width: 2.11–2.35–2.40 mm (n=10); intertegular width: 1.73–1.87–1.92 mm (n=10). Relative head measurements: HW: 100, HL: 90–92, UID: 57–59, LID: 48–49, IAD: 15–16, OAD: 23–24, IOD: 15–16, OOD: 17–18, CL: 30–31, GW: 20–22, EW: 27–28, SL: 25–26, AF4/AF2+3 (20/15, 18/14) 1.28–1.33, FL: 187–190.

Differs from female as follows: upper and lower inner eye margins converging basally; median frontal carina extending about one third to medium ocellus; frons sculpture densely

reticulate-punctate across surface to inner margins of eyes; scape reaches level of median ocellus; clypeus surface polished, shiny, surface weakly convex, close to openly punctate with shallow punctures; supraclypeal area weakly protruding above paraocular area, supraclypeal area rounded, dull, with microtessellate sculpture pattern, closely punctate with minute, shallow punctures; mesoscutum as in female, anterior margin produced forward, mesoscutum smooth with dull sheen, medially closely punctate, anterolaterally, laterad or parapsidal lines, in parapsidal areas densely punctate, scutellum, metanotum similar to mesoscutum; dorsal surface of metapostnotum acarinate, not defined by raised ridge, with microtessellate sculpture, with weak striae, striae just reaching mid-point of dorsal surface; colour similar to female except apical two thirds of clypeus pale yellow, with similar yellow-orange vestiture on pronotum dorsolateral corners, metasomal T2–T3 with basal, yellow tomentum on T3 broader than basal tomentum on T2, in some specimens metasoma with light brown colour banding across metasomal terga T1–T3 (fig. 2D).

Vestiture: lower half of frons, between antennal bases, paraocular area with dense, erect, white hair, gena with moderate beard of long, plumose, white hair, mesoscutum appear glabrous but with sparse cover of short, erect, brown hair, metapostnotum lateral sides with basal, short, white, adpressed hair, metasomal sterna S1–S4 with sparse, white, adpressed hair, S3–S5 with erect, lateral hair tufts, more so on S4 and even more so on S5 (fig. 9F).

Genitalia: (figs. 11C, 11D) gonobase sides widened basally, complete ventroapically, gonocoxae 1.1 x than width of gonobase, 1.2 x longer than length of gonobase, gonocoxa glabrous, dorsal inner margins of gonocoxa basally broadly truncate to broadly rounded. Gonocoxa apical inner margin not produced, continue contours of gonostylus, glabrous; retrorse lobes small, narrow, not meeting at midline, membranous, retrorse lobes glabrous except for one or two setae; gonostylus small to almost absent, apically rounded, with cover of short erect setae; penis valves curved apically, glabrous dorsolaterally.

Distribution: (fig. 12E) this species extends from SE Queensland down eastern New South Wales, across Victoria, one record from SE South Australia, and is absent from Tasmania.

Remarks: Cockerell (1918: 118) commented that *Parasphcodes insculptus* was close to *P. plorator* but noted a colour and sculpture difference. The metasomal T2–T3 yellow tomentum is weak on this type specimen; however, the head measurements are typical for this species. Rayment (1929: 128) commented that *P. rufitarsus* was also close to *P. plorator* but noted colour differences. Michener (1965: 311) commented that *Lasioglossum fulvofasciae* was close to *L. peraustrale* but differed in metasomal colour banding on his new species. Michener (1965: 311) primarily used the metasomal colour banding in the male only to distinguish his new species from *L. insculptum*. Note that Michener's male Holotype of *L. fulvofasciae* has the metasomal colour banding, but his allotype female is typical colouration for *L. tertium*. Apart from Michener's type series for *L. fulvofasciae* collected at Cunnginham's Gap, I have located only a few other specimens with similar banded metasomal colour markings. It

appears the distinctive metasomal banding seen on male specimens of *L. fulvofasciae* are all from SE Queensland (e.g. Cunningham's Gap, Emu Vale, Mt Lindesay and Bald Mountains), suggesting some kind of colour morph variant in that area. I have examined a series of male specimens without the metasomal colour banding also collected by Michener at Cunningham's Gap when he collected the type specimens of *L. fulvofasciae*. Male genitalia examinations of the Cunningham's Gap banded type series specimens and the non-banded males collected by Michener at Cunningham's Gap at the same time showed no differences between these specimens and between other male *L. tertium* genitalia examinations. This is the basis for the *L. fulvofasciae* synonymy. Of note, the banded metasomal morph specimens occur about the northernmost known distribution for this species. The male genitalia of *L. tertium* have shared characters with two other *Australictus* species: the gonobase widened basally is shared with *L. davide* (figs. 10A, 10B, 11C, 11D), and the absence of gonostylus is shared with *L. peraustrale* (figs. 10E, 10F, 11C, 11D). Note that *L. davide*, *L. peraustrale* and *L. tertium* are all absent from Tasmania, while both *L. lithusca* and *L. plorator* do occur in Tasmania.

Lasioglossum (Chilalictus) orbatum (Smith)

(Figs. 12F; Walker 1995, pp. 193–194, figs. 132 A–H)

Halictus orbatum Smith 1853: 58–59.

Halictus viridarii Cockerell 1930: 42. **syn. by** Walker 1995: 193.

Halictus franki Friese H. 1924 **syn. nov.**; Cockerell 1929: 13.

Lasioglossum (Chilalictus) orbatum – Michener 1965: 177.

Lasioglossum (Chilalictus) viridarii – Michener 1965: 177.

Lasioglossum (Australictus) franki – Michener 1965: 165.

Remarks: in the present study, the TYPUS of *Halictus franki* could not be located. ABRs (2022b) lists the type of *Halictus franki* as in AMNH. A search of the AMNH Invertebrate Zoology database for “*Halictus franki*” returned “Objects 0” result (AMNH, 2022a) and a search for just “franki” returned one result for *Paracolletes franki* Cockerell 1929 (AMNH 2022b).

The description of *Halictus franki* lists the TYPUS sex and location as “♀ Freemantle (sic Fremantle), 20 July 1906 Frank leg”. This study has determined that for valid *Lasioglossum (Australictus)* species, the subgenus occurs only along the east coast of Australia and a few records in SE South Australia (figs. 12A–E). If this species does belong to the subgenus *Australictus*, it would suggest the TYPUS location label for *Halictus franki* in Western Australia (Fremantle) is doubtful.

While searching for the *Halictus franki* TYPUS specimen in AMNH, a Friese specimen, missing the metasoma, labelled as TYPUS was located (this specimen was borrowed and examined) with Friese's handwritten label as “*Halictus*” and with an unpublished Australian place-based species name. This specimen has the following labels in descending order: the location label of “Australia: Sydney, 14.9.06 Frank”; a Friese handwritten species name label with “1909 Friese det”; a printed orange TYPUS label; a printed AMNH registration number of “Am. Mus. Nat. Hist. Dept. Invert. Zool. No. 26905”; a handwritten Cockerell determination label; and an undated, typed and handwritten label stating “*Lasioglossum* [typed] *Australictus* [handwritten] det. G.C. Eickwort”.

Below the orange Friese TYPUS label is a Cockerell handwritten label with “*Halictus franki*”. Cockerell (1929: 13) examined this specimen and under the species name “*Halictus franki*”, wrote these remarks:

A second specimen, which has lost the abdomen, but is evidently the same species, is labeled (sic) Sydney, 14.9.06 (Frank). It carries a manuscript name by Friese referring to it as Australian. I assume that Friese withdrew the latter from publication, finding it to be identical with *H. franki*. The hind spur has short noduliform teeth. The mesothorax is excessively densely punctured all over.

Cockerell's (1929) remarks and his handwritten specimen label of *Halictus franki* on the unpublished Friese named specimen provide an insight into the actual species *Halictus franki*. Examination of this unpublished Friese TYPUS specimen confirmed that it is *Lasioglossum (Chilalictus) orbatum*. The identification was confirmed by the specimen having the following subgeneric and species characters. Subgeneric characters: mandibular preapical tooth is not enlarged or elongated but of typical *Chilalictus* length and shape; anterior metatibial spur is typical of *Lasioglossum (Chilalictus)* species (i.e. one large basal tooth followed by a wavy margin to the apex). Species characters: mesoscutum punctuation is typical of *L. (Chilalictus) orbatum*; shape of dorsal surface of the metapostnotum is diagnostic for *L. (Chilalictus) orbatum* (i.e. lateral margins of metapostnotum expanded at level of dorsal surface). Only five species of *Chilalictus* have this type of metapostnotum sculpture (Walker, 1995: 193), and the Sydney location is within the known distribution for *L. (Chilalictus) orbatum* (fig. 12F). From the identification of this specimen, I conclude that *Halictus franki* is a synonym of *Lasioglossum (Chilalictus) orbatum*, a species which is restricted to the east coast of Australia (Walker, 1995, fig. 12F).

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