

branched hair, lateral tomentum on T2 and T3, S2-S4 with long, plumose posteriorly directed hair across sternites, S5 and S6 with short adpressed hair.

Genitalia and associated sterna (figs 52E-H). Gonobase sides slightly flanged basally, gonocoxite without setae, gonostyli long with sparse, short, simple setae, penis valves densely hirsute with long, branched hairs on lateral margins, retrorse lobes setose, well developed, ventral flanges present; S8 median process elongate, tapered apically, with a few setae, S7 median process rounded, glabrous.

Distribution (fig. 52D). Periphery of the arid zone, and a record from Alice Springs.

Etymology. The epithet *bidens* refers to the two teeth on the inner hind tibial spur.

Floral Forage Record. Family visited=1. Catch total=2; Myrtaceae (2 catches). Genus visited, *Eucalyptus* (2).

Flight Phenology.

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Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Remarks. The two unique character states of *L. bidens* are the recurved lateral ridges on the labrum and two large teeth on the inner hind tibial spur.

***Lasioglossum (Chilalictus) blighi* (Cockerell)**

Figures 53A-E

Halictus blighi Cockerell, 1915b: 102.

Halictus bassi Cockerell, 1915b: 102. syn. nov.

Lasioglossum (Chilalictus) blighi. — Michener, 1965: 175.

Lasioglossum (Chilalictus) bassi. — Michener, 1965: 175.

Material examined. Holotype of *blighi*. ♂, Tasmania, Mt Wellington (42°54'S, 147°14'E), 15 Jan-6 Feb 1913, 1,300-2,300ft, R.E. Turner 1913-212, BM Type Hym. 17.a.928 (BMNH).

Holotype of *bassi*. ♂, Tasmania, Mt Wellington (42°54'S, 147°14'E), 15 Jan-6 Feb 1913, 1,300-2,300ft, R.E. Turner 1913-212, BM Type Hym. 17.a.927 (BMNH).

Other specimens examined (1♂). Tasmania, National Park.

Diagnosis. Most like *L. disclusum*. Male with body black, clypeus black, antennae long (FL 3.14 × UID), AS4:AS2+3=1, frons reticulate, mesoscutum dull, finely microtessellate, mesially sparsely to openly punctate, parapsidal areas densely punctures, dorsal surface of pro-

podeum rugulose, not defined by carina, BP absent; sternal vestiture sparse.

Description of male (female unknown). Body length 5.62-5.78 mm (n=2), head width 1.46-1.69 mm (n=2), forewing length 1.46-1.67 mm (n=2). Relative dimensions: HW 100, HL 87-96, UID 64-70, LID 45-48, AOD 15-16, IAD 13-16, OAD 29-32, IOD 21-24, OOD 19-20, CL 20-22, GW 17-22, EW 29-30, ML 32-36, SL 22-26, FL 190-220.

Structure. Head almost as long as broad, inner orbits converging below, median frontal carina weakly developed, reaching median ocellus. Scape not reaching median ocellus. Clypeus moderately long (CL 0.46 × LID), projecting distinctly below lower margins of eyes, shining on basal half and closely punctured, remainder microtessellate and impunctate, supraclypeal area not projecting, impunctate, microtessellate. Antennae long (FL 3.14 × UID), AS4:AS2+3=1. Frons coarsely reticulate above antennal bases, sculpture laterally weakly reticulate, extends vertically to lateral ocelli; vertex with transverse striae. Pronotum lateral process rounded, weakly projecting. Mesoscutum dull, finely microtessellate, mesially sparsely to openly punctate with small, rounded punctures, posteriorly and in parapsidal areas densely punctate with larger punctures. Scutellum longer than dorsal surface of propodeum, surface dull, densely punctured. Dorsal surface of propodeum not defined by carina, posterovertical carinae reaching halfway to dorsal surface, dorsal surface sculpture rugulose, reaching rim. T1 closely punctured. Mesepisternum relatively smooth, metepisternum with horizontal striae on upper half, remainder smooth. BP absent.

Colour. Body black, clypeus black, mandibles dark red-brown apically, flagellum and legs dark brown except tarsi light brown.

Vestiture. Body sparse, face and mesoscutum with erect, branched hair, mesoventral area with long, plumose hair, weak metasomal tomentum laterally on T2-T4; sternal vestiture sparse, erect, branched hair on S1-S3 and S4-S5 with adpressed, simple and minutely branched hair.

Genitalia and associated sterna (fig. 53B-E). Gonobase sides slightly narrowed basally, gonocoxal without setae, gonostyli with simple, apical setae only, long setae dorsally, short setae ventrally, retrorse lobes setose, well developed, ventral flanges present; S8 median process short, truncate, weakly bilobed and glabrous, S7 median process rounded and glabrous.

Distribution (fig. 53A). Tasmania.

Floral Forage Record. None available.

Flight Phenology.

2 0 0 0 0 0 0 0 0 0 0 0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Remarks. Michener's (1965, p. 175) placement of *L. blighi* within the subgenus *Chilalictus* is unusual as the male lacks a hind basitibial plate. This character is more common in other subgenera (e.g. *L. (Parasphecodes)*), although the male genitalia are consistent with those of *Chilalictus*. Association of the female would greatly clarify subgeneric placement. Cockerell (1915e) noted that *L. bassi* was a "variety" of *L. blighi*. I have examined the type material and consider them to be synonymous.

***Lasioglossum (Chilalictus) brazieri* (Cockerell)**

Figures 13A, 54A-H

Halictus brazieri Cockerell, 1916b: 367.

Halictus eboracensis Cockerell, 1918a: 117. syn. nov.

Halictus subetheridgei Rayment, 1953: 23-24. syn. nov.

Lasioglossum (Chilalictus) brazieri. — Michener, 1965: 175.

Lasioglossum (Chilalictus) eboracense. — Michener, 1965: 176.

Lasioglossum (Chilalictus) subetheridgei. — Michener, 1965: 177.

Material examined. Holotype of *brazieri*. ♀, Western Australia, Yallingup (33°39'S, 115°01'E), Nov 1913, R.E. Turner. 1914-190. BM Type Hym 17.a.915 (BMNH, missing right antenna, apical margin of T1 separated from the remainder of tergite.)

Holotype of *eboracensis*. ♀, New South Wales, Ebor (30°24'S, 152°21'E), 30 Dec 1915, 201, A.J. Turner, BM Type Hym 17.a.957 (BMNH, missing last four flagellar segments of left antenna, left hind tarsus except basitarsus).

Syntypes of *subetheridgei* (4♂♂). Victoria: 2♂♂, Emerald (37°56'S, 145°27'E), 1 Jan 1935; 2♂♂, Gorae West (38°15'S, 141°30'E), 10 Nov 1950 (ANIC).

Other specimens examined (71♀, 63♂♂). New South Wales and Australian Capital Territory: Mt Kosciusko, Jindabyne, Snowy Mts, Kiandra, Brindabella Ra., Brown Mtn, Mt Tomah, Blue Mts, Clarence, Orange, Cutler Pass, Barrington Tops, Tubrabucca, New England Nat. Pk, Ebor, Barraba Track, Mt Kaputar Track, Glen Innes.

Victoria: Toora, Beech Forest, Gorae West, Dingley, Cheltenham, Emerald, Oakleigh, Sherbrooke, Olinda, St. Albans, Hamilton, Mt Donna Buang, Bacchus Marsh, Kallista, Clarkefield, Macedon, Howqua, Cobungra, Dinner Plain, Grampians, Falls Creek, Mt Buffalo, Echuca.

Tasmania: Adventure Bay, New Town, Ocean Beach, Launceston, Mt Barrow, St Helens, Forthside,

Yolla. South Australia Meningie, Victor Harbour, Goolwa, Adelaide, Birdwood, Williamstown.

Western Australia: Torndirrup Nat. Pk, Augusta, Cape Freycinet, Yallingup.

Diagnosis. Most like *L. repraesentans*. Both sexes with body black. Female with frons coarsely reticulate, labrum median keel spatulate, lateral ridges weak; mesoscutum anterior margin with bilobed mesial projection, punctation moderately coarse, surface shining, dorsal surface of propodeum ruguloso-striolate, defined by posterolateral angular carinae, posterovertical surface plicate, dorsal rim raised, recessed mesially. Male S3 and S4 with dense long plumose hair across posterior margin, S5 with weak lateral tufts; forewings with 2nd r-m as strong as 1st r-m.

Description of female. Body length 8.62-12.01 mm (\bar{x} =10.31 mm, SD=0.83, n=20), head width 2.23-2.93 mm (n=20), forewing length 2.33-2.94 mm (\bar{x} =2.64 mm, SD=0.15, n=20). Relative dimensions: HW 100; HL 82-85; UID 60-61; LID 55-57; AOD 20-22; IAD 9-10; OAD 23-27; IOD 16-18; OOD 17, CL 21-23; GW 18-20; EW 23-26; SL 41-44; FL 72-73.

Structure. Head broad, inner orbits converging below, median frontal carina reaches median ocelli (fig. 54A), eyes with short, sparse setae. Scape reaching beyond lateral ocelli. Clypeus short (CL 0.39 × LID) weakly convex, shining except microtessellate anteriorly, punctures irregularly shaped, closely punctate, supraclypeal area distinctly protruded, dull and densely punctured. Frons (fig. 54A) coarsely reticulate above antennal bases less so laterally, sculpture extends to level of anterior margin of to lateral ocelli. Labrum (fig. 54B) basal median area raised, sculpture smooth, distal process not tapered, widest at base, median keel spatulate extends beyond margin, lateral ridges weak not extending to margin, distal margin setose, lateral teeth large, distally hooked. Pronotum dorsolateral angles obtuse, projected. Mesoscutum (fig. 54C) anterior margin with bilobed mesial projection, punctation moderately coarse, surface shining except anteriorly, along midline closely punctate, laterad of midline mesially openly punctate (some specimens with weak, oblique, posteriorly directed striae meeting along midline), parapsidal areas closely punctate. Scutellum 1.4 × longer than dorsal surface of propodeum, dull, median line deeply impressed, densely punctured. Dorsal surface of propodeum (fig. 13A) defined by posterolateral angular carinae set well below dorsal surface, postero-

vertical surface transversely plicate, carinae reach dorsal carinae, dorsal rim raised, recessed mesially, sculpture ruguloso-striolate mesially, laterally striolate, sculpture just reaching rim mesially. T1 densely punctate. Mesepisternum and metepisternum with strong, horizontal striae. BP rounded.

Colour. Body black except mandible apically red-brown, antennae, legs and (in some specimens) metasoma dark brown, mesoscutum with a deep, steel blue tinge.

Vestiture. Body sparse, head and mesoscutum with erect, minutely plumose hair, white tomentum laterally on T2, across T3 and T4.

Description of male. Body length 8.47–10.63 mm (\bar{x} =9.12 mm, SD=0.66, n=10), head width 2.39–2.52 mm (n=10), forewing length 2.21–2.77 mm (\bar{x} =2.45 mm, SD=0.21, n=10). Relative dimensions: HW 100, HL 84–86, UID 63–64, LID 50–51, AOD 18–19, IAD 12–13, OAD 23–25, IOD 18–19, OOD 18–19, CL 22–23, GW 22–24, EW 28–29, ML 41–43, SL 30–32, FL 117–119.

Structure. Head broad, inner orbits converging below, eyes with sparse, minute setae; scape just reaching lateral ocelli, clypeus flat, densely punctate, anterior half to three-quarters dull yellow, supraclypeal area weakly produced. Antennae moderately long (FL 1.86 × UID), AS4:AS2+3=0.71. Remainder of body similar to female except dorsal surface of propodeum posterolateral carinae weakly developed; forewings with 2nd r-m as strong as 1st r-m.

Vestiture. Similar to female, paraocular hair erect. S3 and S4 with dense long plumose hair across posterior margin, S5 with weak lateral tufts.

Genitalia and associated sterna (figs 54E–H). Gonobase sides narrowed basally, gonocoxite setose on apical inner and lateral margins, gonostyli setae long and branched, retrorse lobes setose, well developed, ventral flanges present; S8 and S7 median processes apically rounded, setose with simple setae.

Distribution (fig. 54D). Eastern and western zones of the Bassian province.

Floral Forage Record. Families visited=13. Catch total=27; Boraginaceae (1 catch), Compositae (7), Epacridaceae (1), Fabaceae (1), Iridaceae (1), Liliaceae (1), Myrtaceae (7), Onagraceae (2), Ranunculaceae (2), Rosaceae (1), Rutaceae (1), Thymelaeaceae (1), Umbelliferae (1). Genera visited=21; unidentified genus of Compositae (1), *Baekkea* (1), *Boronia* (1), *Bra-*

chycome Cass. (1), *Burchardia* (1), *Calytrix* (1), *Cichorium* L. (1), *Conium* (1), *Cotoneaster* [B. Ehrh.] Medik. (1), *Cynoglossum* L. (1), *Dillwynia* Sm. (1), *Epilobium* L. (2), *Eucalyptus* (3), *Hypochoeris* L. (1), *Leptospermum* (1), *Leucopogon* (1), *Muscari* Mill. (1), *Pimelea* Banks & Solander (1), *Ranunculus* L. (2), *Senecio* (3), *Watsonia* Boehm. (1).

Flight Phenology.

20 8 2 0 2 0 0 0 11 8 14 10
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Remarks. Cockerell (1916b) gave the sex of the type of *Halictus brazieri* as male; however, examination of the specimen reveals that it is female.

***Lasioglossum (Chilalictus) brochum* sp. nov.**

Figures 9C, 17A, 55A–D

Material examined. Holotype. ♀, Northern Territory, Waterhouse Range, 39 km SSW of Alice Springs (23°59'S, 133°38'E), 11 Oct 1978, JCC (ANIC).

Paratypes (15♀). South Australia: 1♀, Brachina Gorge (31°20'S, 138°34'E), 10 Nov 1987, IDN & JCC (ANIC); 8♀, Uro Bluff, 28 mi (45 kms) NNW of Pt Augusta (32°07'S, 137°34'E), 30 Oct 1971, TFH, on *Eremophila longifolia* (SAM); 1♀, N. Middleback Range (33°03'S, 137°09'E), 7–8 Oct 1973, TFH, on *Eremophila alternifolia* (SAM).

Northern Territory: 1♀, 53 km NE of Alice Springs (23°35'S, 134°22'E), 6 Oct 1978, JCC, on *Eremophila* sp (ANIC); 1♀, 10 km NE of Alice Springs (23°37'S, 133°54'E), 6 Nov 1979, IDN, on *Eucalyptus* (ANIC); 1♀, 39 km E of Alice Springs (23°41'S, 134°15'E), 25 Sep 1978, JCC (ANIC); 2♀, same data as holotype (ANIC).

Diagnosis. Mandible shape similar to *L. nigropolatum*, but unlike any other species. Female with body black except metasoma light red-brown, frons elongate, striate, labrum basal median area raised forming two tubercles, distal process tapered, mandibles with preapical mandibular tooth forming large, rounded boss, pronotal dorsal lateral angles not projected, mesoscutum dull, closely to densely punctate, dorsal surface of propodeum ruguloso-striolate on basal half only, defined by posterolateral angular carinae.

Description of female (male unknown). Body length 5.08–5.62 mm (\bar{x} =5.43 mm, SD=0.17, n=10), head width 1.57–1.65 mm (n=10), forewing length 1.34–1.53 mm (\bar{x} =1.43 mm, SD=0.06, n=10). Relative dimensions: HW 100, HL 89–90, UID 60–61, LID 51–52, AOD 20–21, IAD 10–11, OAD 34–35, IOD 20–21,

OOD 11–13, CL 21–22, GW 17–18, EW 27–28, SL 38–39, FL 80–82.

Structure. Head elongate, almost as long as broad, frons elongate, clypeus well projected below lower levels of eyes, inner orbits converging below, median frontal carina reaches median ocellus, although upper portion weak, eyes appear bare though with a few minute setae. Scape just reaches anterior margin of median ocellus. Clypeus short (CL 0.40 × LID), weakly convex, more so ventrally, surface shining except anterior margin dull, basally with several shallow, rounded punctures openly to closely punctate, basally with fine transverse lines, impunctate, supraclypeal area weakly projected mesially shining and closely punctate, around margins dull, impunctate. Frons (fig. 55A) elongate (FL 0.35 × HW), finely striate above antennal bases, striae meet along midline forming V-shaped lines, sculpture laterally weakens to sparsely punctate, extends vertically to anterior margin of lateral ocelli. Labrum (fig. 55B) basal median area raised forming two tubercles, anterior margin rounded mesially, raised to form distinct lip, lateral areas weakly recessed, distal process tapered, widest at base, median keel broad, lateral ridges large, gently sloped on proximal side, extend to margin, setae not present across distal margin, lateral teeth absent. Mouthparts with preapical mandibular tooth grossly enlarged, forming large, rounded boss (fig. 9C). Pronotum dorsolaterally rounded, not projected. Mesoscutum (fig. 55C) anterior margin rounded, punctation fine, surface dull, covered with fine lineolation, anteriorly impunctate, remainder closely to densely punctate with small, shallow, rounded punctures. Scutellum length equal to dorsal surface of propodeum length, surface shining, sparsely punctate except along midline dull with fine longitudinal lines. Dorsal surface of propodeum (fig. 55C) defined by weak posterolateral angular carinae set well below dorsal level, posterovertical carinae reach dorsal carinae, dorsal sculpture weak, ruguloso-striolate on basal half only, lateral margins smooth, dorsal rim rounded, with dull sheen. T1 densely punctate except posterior marginal area punctation reduced, mesepisternum and metepisternum smooth. Fore tibial spur comb shaped (fig. 17A); BP rounded.

Colour. Head and mesosoma black, metasoma light red-brown, mandibles light amber except apically dark red-brown, antennae brown above, light brown underneath, legs brown except fore and mid tibiae and tarsi light brown.

Vestiture. Body sparse, paraocular areas with

erect branched hair, frons almost bare, mesoscutum with short, semi-erect, branched hair almost forming a mat across posterior margin.

Distribution (fig. 55D). Eyrean, known at present from Port Augusta to Alice Springs.

Etymology. The epithet *brochum* means "projecting tooth" and refers to the shape of the mandibles.

Floral Forage Record. Families visited=2. Catch total=4; Myoporaceae (3 catches), Myrtaceae (1). Genera visited=2; *Eremophila* (3), *Eucalyptus* (1).

Flight Phenology.

1 0 0 0 0 0 0 0 1 4 2 0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Remarks. *Lasioglossum brochum* and *L. nigropolatum* are non-metallic, yet they share a number of labrum characters that are more usually associated with metallic species, although only *L. brochum* has an elongated frons. The female of *L. nigropolatum* has macrocephalic development which may be associated with a wood-nesting habit. The unusual character shared by these two species is the enlarged pre-apical tooth on the mandible.

***Lasioglossum (Chilalictus) brunnesetum* sp. nov.**

Figures 23A, 26A, 56A–H

Material examined. Holotype. ♀, Queensland, 4 mi (6.4 kms) W of Paluma (19°00'S, 146°10'E), 3,000ft, 13 Apr 1969, I.F.B. Common & M.S. Upton (ANIC).

Paratypes (14♀, 1♂). Queensland: 14♀, Paluma (19°00'S, 146°12'E), Aug 1966, JCC, on *Helichrysum rupicola* (UQIC); 1♂, same data as holotype (ANIC).

Other specimens examined (77♀, 62♂). Queensland: Amiens, Mt Nebo, Bunya Mts.

New South Wales and Australian Capital Territory: Nadgee Reserve, Bondi State Forest, Snowy Mts, Brindabella Ra., Blue Mts Nat. Pk.

Victoria: Dromana, Gorae West, Nelson, Beaumaris, Walhalla, Sandringham, Belgrave, Ferntree Gully, Bayswater, Melbourne, Woori Yallock, Mt Evelyn, Seville, Millgrove, Healesville, Noorinbee, Bendigo, Mt Buffalo.

Tasmania: Southport, Eaglehawk Neck, Kingston, The Lea, Hobart, Weldborough, Gladstone.

South Australia: Athelstone, Kangaroo Island, Belair, Mt Lofty.

Diagnosis. Brown vestiture on mesoscutum not found on any other species. Both sexes black. Female with frons striate, mesoscutum covered with short brown setae, densely punctate, dorsal surface of propodeum weakly ruguloso-striolate