

SUPPLEMENT TO A REVISION OF AUSTRALIAN MEMBERS OF THE BEE GENUS
HOMALICTUS (COCKERELL) (HYMENOPTERA: HALICTIDAE)

KENNETH WALKER

Department of Entomology, Museum of Victoria,
71 Victoria Crescent, Abbotsford, Vic. 3067, Australia

Abstract

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Five new species, *Homalictus adiazetus*, *H. pilosignya*, *H. megagnathus*, *H. sicarius* and *H. verticulus*, the males of *H. andrewsi* (Kirby), *H. atrus* Walker and *H. mailandi* (Cockerell) and female of *H. forrestae* are described. The discovery of *H. megagnathus* extends the known distribution of *H. (Papualictus)* Michener, previously New Guinea, into north-eastern Australia and requires the subgeneric diagnosis to be revised. Inferred species relationships, based on newly available character states, are revised.

Introduction

Walker (1986) revised and inferred sister-group relationships for 39 known species of Australian *Homalictus* Cockerell. A supplement to that revision is now necessary. Five new species are recognised, including the first Australian species of the subgenus *Papualictus* Michener and males of three and the female of one previously known species are described and figured for the first time. These species and additional character states (both sexes: head, mesoscutum and propodeum sculpture characteristics; and male genitalia) are used to revise inferred species-group relationships.

Terminology and Abbreviations

Terminology and methods follow Walker (1986) with these exceptions: the gaster is called the metasoma; the forewing length measurement is taken from the base of the arcuate basal vein (M) to the distal-most margin of the third submarginal cell (2nd r-m); and, relative head measurements are standardised to a head width of 100 units allowing them to be expressed as a percentage and therefore directly compared between sexes and species. Sculpture definitions follow Harris (1979) and punctation density rates are defined as: 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 one but less than twice diameter of puncture; sparse — interspaces between punctures equal to or greater than twice diameter of puncture.

Institutions are abbreviated as follows: AM, Australian Museum, Sydney, New South Wales; ANIC, Australian National Insect Collection,

CSIRO, Canberra, Australian Capital Territory; BCRI, Biological and Chemical Research Institute, Rydalmere, Sydney, New South Wales; BMNH, Natural History Museum, London (statutory name: British Museum (Natural History)); NMV, Museum of Victoria, Melbourne, Victoria.

Descriptive abbreviations are as follows: AOD, antennocular distance; CL, clypeus length; CW, clypeus width; EW, cyc width in side view; FL, flagellum length; GL, glossa length; GW, maximum genal width in side view; HL, head length; HW, head width; IAD, interantennal distance; IOD, interocellar distance; LID, lower interorbital distance; ML, mandible length; OAD, ocellantennal distance; OOD, ocellocular distance; S1-S8, metasomal sterna 1-8; SL, scape length; T1-T5, metasomal terga 1-5; UID, upper interorbital distance.

Homalictus Cockerell

Homalictus Cockerell, 1919: 13. Type species: *Halictus taclabanensis* Cockerell, 1915: 488 (by original designation).

Subgenus *Homalictus*

Diagnosis. See Walker (1986: 115).

Homalictus (Homalictus) adiazetus sp. nov.

Material examined. Holotype, ♀ Qld, Bunya Mts (26°51'S, 151°34'E), 22 Jan 1938, N. Geary, 2000 ft (610 m) (AM; Missing right hind tarsal segments.)

Paratype, 1♀ NSW, Minnamurra Falls (34°38'S, 150°43'E), 10 Feb 1962, C.E. Chadwick (BCRI).

Diagnosis. A member of the "*sphecodoides*" species-group (see Walker (1986) for species-group definitions); female with frons striate above antennal bases, pronotum dorsolateral

angles sharply acute, mesoscutum mesially and posteriorly densely punctate, parapsidal areas scabrous, dorsal surface of propodeum striate with a few interconnectives mesially.

Description of female. (male unknown) (measurements of holotype in bold). Body length: 5.18–5.39 mm; Forewing length: 1.48–1.51 mm; Head width: 1.47–1.49 mm. Relative head measurements: HW: 100; HL: 81–82; UID: 58–59; LID: 54–55; AOD: 18–20; IAD: 9–10; OAD: 33–34; IOD: 16–17; OOD: 15–16; CL: 18–19; GW: 16–17; EW: 24–25; SL: 44–45; FL: 80–82.

Structure. Head broad, inner orbits converging below, median frontal carina almost absent, extending just beyond supraclypeal area, eyes with sparse cover of minute setae. Scape reaches at least posterior margin of median ocellus. Clypeus weakly convex, in side view, anterior half shining, densely to closely punctate with large, deep punctures, posterior half dull, covered with a fine reticulate pattern, sparsely punctate with small, shallow punctures. Frons striate above antennal bases to level of posterior margin of median ocellus, sculpture laterally striate though weakened to smoothly and sparsely punctate along inner margin of eyes, lower paraocular areas smooth, shining and glabrous; vertex almost smooth, with a few transverse striae. Pronotum dorsolateral angles sharply acute, weakly projected. Mesoscutum surface dull, anterior margin straight, anteriorly sparsely punctate, mesially and posteriorly densely punctate, parapsidal areas scabrous, punctures contiguous with raised edges. Scutellum shining, closely to densely punctate, scutellum length equal to length of dorsal surface of propodeum. Dorsal surface of propodeum not delimited by carinae, sculpture broadly striate with a few interconnectives mesially, sculpture reaches lateral margins only. Mesepisternum and metepisternum smooth, covered with a fine reticulate pattern. Fore basitarsal comb fan shaped, hind basitibial plate apically rounded, inner hind tibial spur coarsely serrate with apices of at least five teeth, their bases fused.

Colour. Head, scutellum and propodeum black, antennal scapes dark brown, flagellum segments light brown; mesoscutum dull with a dark blue hue; metasoma red-brown suffused with dark brown apically; legs red-brown except femora, trochanters and coxae a darker brown. *Vestiture.* Body sparse, head and mesoscutum with short erect, minutely branched hair, metanotum and lateral margins of scutellum densely

hirsute; metasomal T1–T2 glabrous, T3–T4 with sparse hair cover.

Distribution. South-eastern Queensland and coastal central New South Wales.

Etymology. The epithet “*adiazetus*” means unpolished and refers to the sculpture pattern on the head and mesoscutum.

Remarks. *Homalictus adiazetus* body colour patterns are similar to *H. megastigmus* (Cockerell) and *H. niveifrons* (Cockerell) but the coarse vertical striae on the frons and the densely punctate mesoscutum differs from both.

Homalictus (Homalictus) andrewsi
(Kirby) comb. nov.

Figures 1–3

Halictus andrewsi Kirby, 1900: 86.

Syntypes. 11♀, Christmas Island, north part of the island, January 1898, Andrews (BMNH; not examined).

Material examined. Christmas I. 52♀ Ethel Beach (10°28'S, 105°42'E), 15 Apr 1989, J.C. Cardale (collected in either closed forest or yellow trays); 7♀, 2♂ nr Grants Well (10°29'S, 105°39'E), 15, 24 and 29 Apr 1989, J.C. Cardale (♂ collected at light); 5♀, 1♂ Central Area Wkshp (10°29'S, 105°38'E), 14–15 Apr 1989, J.C. Cardale; 1♀ Lily Beach Road (10°28'S, 105°42'E), 13–28 Apr, J.C. Cardale, malaise trap/trough. (ANIC).

Diagnosis. A member of the *urbanus* species-group; female with frons finely striate, pronotum dorsolaterally rounded, mesoscutum posterior two thirds densely punctate, dorsal surface of propodeum smooth except with several striae on basal half; male with frons striate, mesoscutum impunctate, genae with conspicuous cover of long, plumose hair.

Description of female. Body length: 5.24–5.78 mm; Forewing length: 1.32–1.41 mm; Head width: 1.55–1.62 mm. Relative head measurements: HW: 100; HL: 88–91; UID: 48–49; LID: 51–52; AOD: 18–19; IAD: 09–10; OAD: 33–34; IOD: 15–16; OOD: 09–10; CL: 20–21; GW: 17–19; EW: 26–27; SL: 45–46; FL: 95–98.

Structure. Head elongate, inner orbits diverging below, ocellocular distance markedly less than interocellar distance. Frons finely striate, striae with interconnectives giving appearance of a widely spaced reticulate pattern, supraclypeal area and clypeus dull, covered with minute reticulate pattern, almost impunctate except for several weak, sparse, shallow punctures. Pronotum dorsolaterally rounded, not well projected. Mesoscutum and scutellum dull, covered with a

conspicuous minutely reticulate pattern, anterior half of mesoscutum sparsely punctate, posterior two thirds and scutellum densely punctate with shallow punctures. Dorsal surface of propodeum not defined by carinae, surface dull, smooth except with several striae on basal half. Metasomal terga impunctate.

Description of male. Body length: 4.69–4.80 mm; Forewing length: 1.19–1.22 mm; Head width: 1.32–1.34 mm. Relative head measurements: HW: 100; HL: 91–93; UID: 54–55; LID: 40–41; AOD: 13–14; IAD: 11–12; OAD: 31–33; IOD: 14–15; OOD: 14–15; CL: 21–22; GW: 16–17; EW: 29–30; SL: 36–37; FL: 114–116.

Structure. Head elongate, inner orbits converging below, not strongly so, scape just reaches anterior margin of median ocellus. Remainder of body similar to female except: frons sculpture distinctly striate, supraclypeal area, clypeus, mesoscutum and scutellum impunctate, all dull and covered with a conspicuous reticulate pattern, dorsal surface of propodeum sculpture restricted to basal margin.

Colour. Head and mesosoma dull metallic green, head with a golden sheen, metasoma with dark emerald green, surface with distinctive sheen; legs with coxae and femora dark green except mid femora suffused with red-brown, tibiae and tarsi red-brown and variously suffused with dark brown.

Vestiture. Body sparse, head and mesoscutum with sparse cover of short, erect, branched hair, genae with conspicuous cover of long, plumose hair forming a beard, metasomal sternites with moderate cover of erect, plumose hair, hair not forming distinctive pattern.

Genitalia and associated sterna. (figs 1–3).

Distribution. Christmas Island.

Remarks. The male is described and figured here for the first time. Kirby's description of the female is adequate for species recognition, however, the partial redescription presented here provides characters necessary for comparative purposes. *Homalictus andrewsi* is most like *H. urbanus* (Smith) but differs in both sexes by the sculpture on the dorsal of the propodeum (*andrewsi*- almost smooth; *urbanus*- coarsely ruguloso-striate). The shape of the eyes in the female (inner orbits diverging below) does not occur in any other member of the *urbanus* species-group. Kirby (1900) described two halictids, *Halictus andrewsi* and *H. binghami* (the latter now placed under *Pachyhalictus* Cockrell; see Michener (1978)), from the collections

made by Mr C. Andrews on Christmas Island in 1898. Ms J. Cardale collected extensively (direct sweeping, yellow pan, malaise and light traps) on Christmas Island in 1989 yet the only halictid species collected was *H. andrewsi* (pers. comm. J.C. Cardale). *Pachyhalictus binghami* may now be extinct.

Homalictus (Homalictus) atrus Walker

Figures 4–6

Homalictus atrus Walker, 1986: 122.

Material examined. Holotype. ♀ Qld, Moses Ck, 4 km NE Mt Finnigan (15°47'S, 145°17'E), 14–16 Oct 1980, J.C. Cardale (ANIC).

Other specimens examined: Qld: 13♀, 19♂ Mellwraith Range, 30 km E of Coen (13°50'S, 143°17'E), 3 Nov 1988, K. Walker (NMV).

Diagnosis. A member of the "*blackburni*" species-group; male with frons impunctate, clypeus black, pronotum dorsolateral angles acute, mesoscutum sparsely to openly punctate, dorsal surface of propodeum sculpture ruguloso-striolate, fore and mid leg tarsal segments flanged laterally, genal hairs long, fore leg coxae and trochanters and mid and hind coxae with dense cover of long, plumose hair, lateral margins of fore tarsi with long, simple hairs, rasp-like sculpture on the apicoventral surface of the genitalia volsellae.

Description of male. Body length: 4.24–4.47 mm; Forewing length: 1.01–1.06 mm; Head width: 1.27–1.29 mm. Relative head measurements: HW: 100; HL: 86–88; UID: 58–61; LID: 34–35; AOD: 12–13; IAD: 10–11; OAD: 35–37; IOD: 18–20; OOD: 14–15; CL: 20–21; GW: 15–16; EW: 32–33; SL: 28–30; FL: 175–179.

Structure. Head broad, sculpture smooth, covered with a finely reticulate pattern, frons and supraclypeal area impunctate, clypeus sparsely punctate; inner orbits converging strongly below; scape reaches well short of anterior margin of median ocellus. Pronotum dorsolateral angles acute, weakly produced. Mesoscutum and scutellum dull, microtesselate, both sparsely to openly punctate with shallow punctures. Dorsal surface of propodeum not defined by carinae, sculpture ruguloso-striolate, extends to dorsal rim. Fore and mid leg tarsal segments flanged laterally.

Colour. Body black except antennal flagella dark brown; legs brown except tarsi light red-brown.

Vestiture. Body sparse except genal hairs long, forming a "beard", mesoventral area and fore

leg coxae and trochanters with dense cover of long, plumose hair, mid and hind coxae and trochanters with similar hair, forming a moderate cover; lateral margins of fore tarsi with long, simple hairs.

Genitalia and associated sterna. (figs 4–6).

Distribution. Cape York Peninsula and north Queensland.

Remarks. The male is described and figured here for the first time. *Homalictus atrus* is most like *H. luteipes* (Friese) but differs in both sexes by colour and sculpture characters (*atrus* ♀: tibiae black, propodeum openly ruguloso-striolate, ♂: clypeus black, propodeum ruguloso-striolate; *luteipes* ♀: tibiae light red-brown, propodeum closely ruguloso-striolate, ♂: clypeus dull white on lower one third, propodeum weakly striolate). Female characters alone inferred a sister-group relationship of *H. atrus* with *H. luteipes* (Friese), a Papua New Guinea species. However, with additional male characters and new species now available, two clades involving five species seem apparent. Prominent projections on the apicoventral surface of the genitalia volsellae provide a synapomorphy for a clade containing *H. luteipes* (fig. 4), *H. cassiaefloris* (Cockerell) (see Walker, 1986: fig. 19a) and *H. eurhodopus* (Cockerell) (see Walker, 1986: fig. 19d). Fore leg vestiture (fore leg coxae and trochanters with dense cover of long, plumose hair and lateral margins of fore tarsi with long, simple hairs) and the rasp-like sculpture on the apicoventral surface of the genitalia volsellae provide synapomorphies for a second clade containing *H. atrus* and *H. pilosignya* sp. nov.

Homalictus (Homalictus) forrestae Walker

Homalictus forrestae Walker, 1986: 139.

Material examined. Qld, Heathlands (11°45'S, 142°35'E): 2♀ 25 Jul–18 Aug; 1♂ Jun–25 Jul; 2♀ 18 Aug–18 Sep; 1♀ 18 Sep–21 Oct; 1992, P. Zborowski, J. Cardale, T. Weir, L. Miller and E. Nielsen, ex Malaise trap. (ANIC)

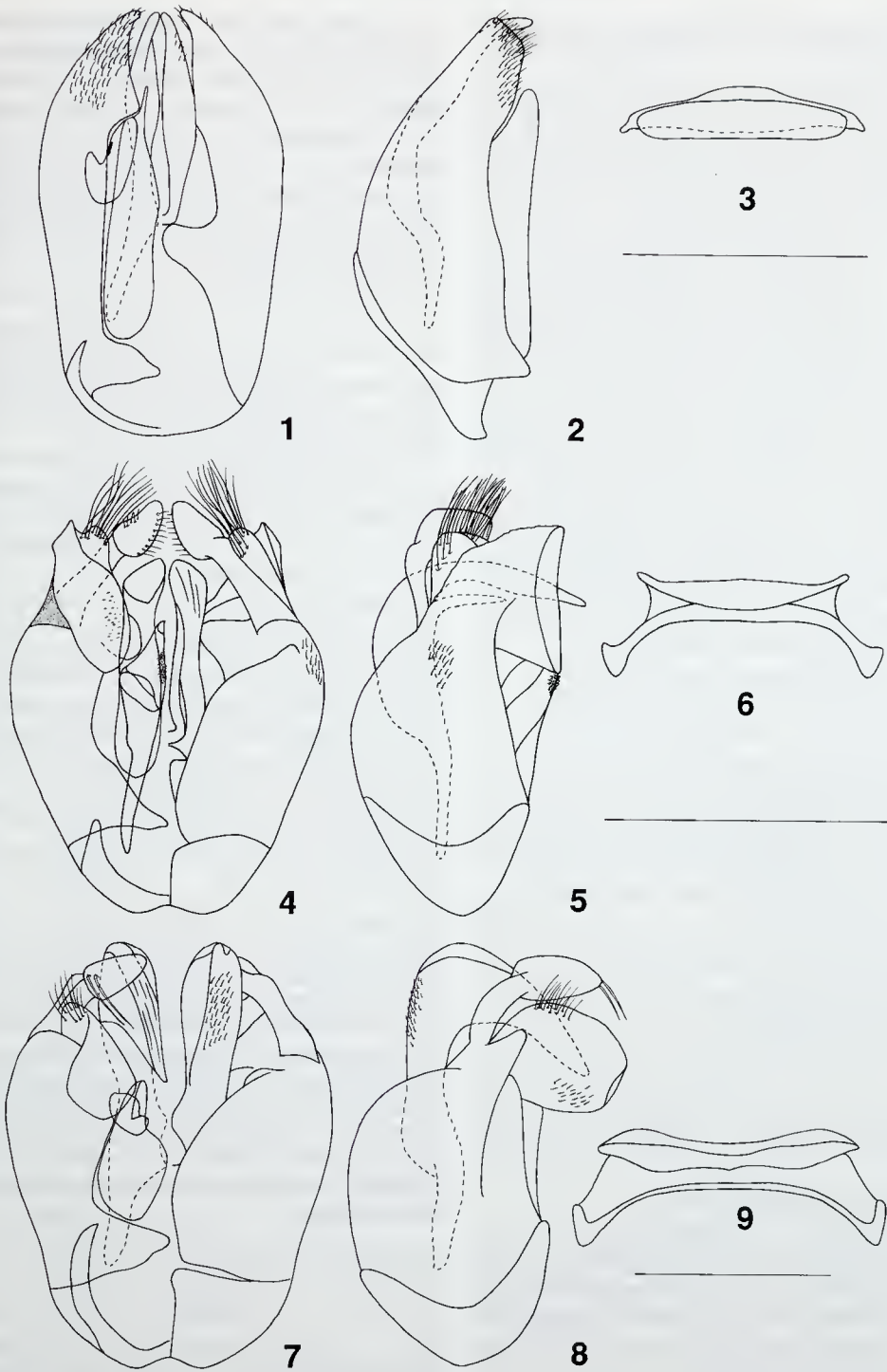
Diagnosis. A member of the “*forrestae*” species-group; female with frons weakly striate, pronotum dorsolaterally rounded, mesoscutum mesially closely to densely punctate, openly to closely punctate in parapsidal areas, dorsal surface of propodeum sculpture coarsely ruguloso-striate, anterior surface of hind tibia with hairs nearly simple, bristlelike or with 1 or 2 branches (no area with abundant, short, erect, plumose hairs as is usual for the genus), hind tibiae slender, under surface scarcely concave.

Description of female. Body length: 4.62–4.85 mm; Forewing length: 0.87–0.96 mm; Head width: 1.24–1.32 mm. Relative head measurements: HW: 100; HL: 92–94; UID: 64–65; LID: 56–58; AOD: 18–19; IAD: 09–10; OAD: 36–37; IOD: 18–19; OOD: 18–19; CL: 20–21; GW: 16–17; EW: 27–28; SL: 40–41; FL: 70–72.

Structure. Head elongate, inner orbits converging strongly below, median frontal carina present, reaches less than halfway to median ocellus; eyes with sparse cover of minute setae. Scape elongate, just reaches anterior margin of median ocellus. Clypeus with more than two-thirds projected below lower margins of eyes, weakly convex in side view, anterior margin straight, anterior half with several, large puncture, posterior half openly to sparsely punctate with small, shallow puncture, supraclypeal area sparsely punctate. Frons and genae weakly striate, striae reach anterior margin of lateral ocelli, vertex smooth. Pronotum dorsolaterally rounded, weakly projected. Mesoscutum surface dull, covered with microtessellate pattern, anteriorly impunctate, mesially closely to densely punctate, openly to closely punctate in parapsidal areas. Scutellum openly to closely punctate, scutellum length equal to length of dorsal surface of propodeum. Dorsal surface of propodeum not defined by carinae, sculpture coarsely ruguloso-striate, extends to dorsal rim. Mesepisternum and metepisternum striate. Anterior surface of hind tibia with hairs nearly simple, bristlelike or with 1 or 2 branches (no area with abundant, short, erect, plumose hairs as is usual for the genus); hind tibiae slender, under surface scarcely concave; hind basitibial plate apically rounded; inner hind tibial spur coarsely serrate with 2 teeth.

Colour. Head blue-green, though frons above antennal bases, supraclypeal area and basal half of clypeus with copper tinge, remainder of clypeus black; antennae dark brown except underneath of flagellar segments light brown; mesoscutum and scutellum green-blue suffused with copper tinge, propodeum dark blue, metasomal terga dark brown; legs with coxae, trochanters and femora dark brown, apical end of femora, tibiae and tarsi light red-brown.

Vestiture. Body sparse, except tomentose hair on pronotum mesodorsal and dorsolateral areas, lateral margins of propodeum with long plumose hair; ventral metasomal scopae as usual for the genus, hind leg scopae present though not as pubescent as is usual for the genus.



Figures 1-9. *Homalictus* spp. male genitalia. *H. andrewsi*: figs 1-3: ♂, Christmas Island, Grants Well, Apr 1989, J.C. Cardale., ANIC. *H. atrus*: figs 4-6: ♂, Qld, McIlwriath Range, 30 km E of Coen, 3 Nov 1988, K. Walker, NMV. *H. maitlandi*: figs. 7-9: ♂, Qld, Claudie River, 1 mi W of Mt Lamond, 19 Dec 1971, D.K. McAlpine, G.A. Holloway, D.P. Sands, AM. 1, 4, 7: ventral view (left half) and dorsal view (right half); 2, 5, 8: lateral view; 3, 6, 9: metasomal S7 and S8. Scale lines (associated with each species) = 0.5 mm.

Distribution. Cape York Peninsula and western Queensland.

Remarks. The Heathlands population was identified as *H. forrestae* after comparison of the genitalia of the single new male with that of the male holotype from western Queensland. The female is described and figured here for the first time and its character suite confirms the inferred sister-group relationship with *H. urbanus*. *Homalictus forrestae* is most like *H. urbanus* but differs with the female hind tibiae slender, under surface scarcely concave and anterior surface with hairs nearly simple, the male flagellum length (*urbanus* Fg:UID > 1.5; *forrestae* Fg:UID < 1.5) and male T1 punctation (*urbanus*, a sparsely punctures mesially; *forrestae*, closely punctate mesially). The female hind tibial characters also occur on species of *H. (Papualictus)* and *H. (Quasialictus)*. However, I consider *Homalictus* proper the correct placement for *H. forrestae* as the hind tibial characters are the only characters shared, in both sexes, with the other two subgenera.

***Homalictus (Homalictus) maitlandi* (Cockerell)**

Figures 7–9

Halictus maitlandi Cockerell, 1910: 223.

Homalictus maitlandi. — Michener, 1965: 180, 338. — Walker, 1986: 145.

Material examined. Holotype ♀ Qld, Cairns, Kuranda, Mar 1902, Turner (BMNH).

Other specimens examined: Qld, (6♀) same data as holotype; 1♀ Mossman Gorge (16°29'S, 145°16'E), Daintree Nat. Park, 26 Oct 1988, K. Walker (NMV); 1♀ Mellwraith Range, c. 510 m (13°45'S, 143°21'E), 22–27 Jul 1977, R.W. Taylor, in rain forest (ANIC); 1♀, 3 km ENE Mt Tozer (12°44'S, 143°14'E), 28 Jun–4 Jul 1986, J.C. Cardale, ex. Malaise trap (ANIC); 2♀ 11 km ENE Mt Tozer (12°43'S, 143°18'E), 11–16 Jul 1986, J.C. Cardale, ex. ethanol (ANIC); 1♂ Claudie River, 1 mi W Mt Lamond (12°43'S, 143°17'E), 19 Dec 1971, D.K. McAlpine, G.A. Holloway, D.P. Sands (AM).

Diagnosis. See Walker (1986).

Description of male. Body length: 6.16 mm; Forewing length: 1.48 mm; Head width: 1.62 mm. Relative head measurements: HW: 100; HL: 85; UID: 58; LID: 42; AOD: 15; IAD: 10; OAD: 28; IOD: 16; OOD: 16; CL: 22; GW: 16; EW: 31; SL: 34; FL: 142.

Structure. Head broad, inner orbits converging strongly below, eyes glabrous; median frontal carina absent; scape reaches anterior margin of median ocellus; clypeus convex, shining though covered with fine reticulate pattern.

Frons smooth though covered with distinct tessellate pattern; vertex broad. Pronotum dorsolateral angles bluntly obtuse, well projected. Mesoscutum and scutellum smooth. Dorsal surface of propodeum not defined by carinae, smooth except weakly ruguloso-striolate along posterior margin. Metasomal terga impunctate and smooth. Fore and mid tarsal segments flanged laterally; hind basitibial plate complete, bluntly acute apically.

Colour. Body black except metasoma dark brown, anterior half of clypeus pale white-yellow, antennal scapes and pedicels red-brown, legs and coxae, trochanters and basal half of fore femora brown, remainder of legs light red-brown except tarsal segments pale white.

Vestiture. Body sparse except lower frons and paraocular areas with cover of adpressed, plumose hair, genae with dense cover of long, plumose hair forming a “beard”; anterolateral corners of mesoscutum, metanotum and lateral margins of propodeum with dense cover of long, plumose golden hair, posterior margin of mesoscutum with weak band of hair, fore coxae with some long, plumose hair, fore trochanters with dense cover of long, plumose hair, hair length exceeds length of femur; fore and mid tarsi with dense cover of simple and plumose hair, mid and hind femora almost glabrous.

Genitalia and associated sterna. (figs 7–9).

Distribution. Cape York Peninsula and north Queensland.

Remarks. Walker's (1986) comments on *H. maitlandi* were based on the only available material (types collected in 1902). Recently collected specimens confirm the species is extant and provide the male character suite described and figured here. Examination of the male genitalia characters affirms the placement of *maitlandi* within *Homalictus* and these characters, together with flanged tarsal segment characters, provide synapomorphies for the clade of *H. maitlandi*, *H. latitarsis* (Friese) and *H. grossopedalus* Walker.

***Homalictus (Homalictus) pilosignya* sp. nov.**

Figures 10–12

Material examined. Holotype, ♀ Qld, Mellwraith Range, 30 km E of Coen (13°50'S, 143°17'E), 3 Nov 1988, K. Walker (NMV, T-16621).

Paratypes, 6♀ (NMV, T-16622–T-16627), 3♂ (NMV, T-16628–T-16630) same data as holotype.

Diagnosis. A member of the “blackburni” species-group; female with frons smooth,

pronotum dorsolateral angles obtuse, mesoseutum sparsely to openly punctate, dorsal surface of propodeum mesially coarsely ruguloso-striate, laterally striate; male with mesoseutum impunctate, dorsal surface of propodeum ruguloso-striolate, fore and mid leg tarsal segments laterally flanged, genal hairs long, fore leg trochanters with dense cover of long, plumose hair, lateral margins of fore tarsi with long hairs, branched on only the outer surface of the hair shaft.

Description of female. (measurements of holotype in bold) Body length: 5.62–5.69 mm; Forewing length: 1.41–1.43 mm; Head width: 1.74–1.79 mm. Relative head measurements: HW: 100; HL: 81–83; UID: 50–52; LID: 46–47; AOD: 17–18; IAD: 8–09; OAD: 32–33; IOD: 13–14; OOD: 12–13; CL: 17–18; GW: 15–16; EW: 25–26; SL: 45–46; FL: 82–83.

Structure. Head broad, inner orbits converging below, median frontal carina absent; eyes with sparse cover of minute setae. Scape elongate, reaches at least posterior margin of median ocellus. Clypeus weakly convex in side view, anterior margin coarsely and irregularly indented, remainder of surface dull, covered with sparse, minute puncture, supraclypeal area impunctate. Frons, vertex and paraocular areas smooth, covered with a microtessellate pattern, sparsely punctate with piliferous punctures. Pronotum dorsolateral angles obtuse, weakly projected. Mesoseutum surface dull, covered with microtessellate pattern arranged as a circular pattern, openly to sparsely punctate with piliferous punctures. Scutellum sculpture similar to mesoseutum except close to openly punctate, scutellum length equal to length of dorsal surface of propodeum. Dorsal surface of propodeum not defined by carinae, sculpture mesially coarsely ruguloso-striate, laterally striate, sculpture reaches dorsal rim. Mesepisternum and metepisternum smooth, with fine reticulate pattern. Fore basitarsal outer apicolateral comb absent, hind basitibial plate apically obtuse, inner hind tibial spur coarsely serrate with 3 teeth.

Colour. Body black except antennal flagella brown, mesoseutum and scutellum sooty black, metasoma tergum I with dark blue hue, legs with tarsi brown.

Vestiture. Body sparse, except tomentose hair on pronotum mesodorsal and dorsolateral areas, mesoscutum anterolaterally and anterior spiracle cover, lateral margins of propodeum with long plumose hair; hind leg and ventral metasomal scopa as usual for the genus.

Description of male. Body length: 3.92–4.62 mm; Forewing length: 3.85–4.01 mm; Head width: 1.29–1.34 mm. Relative head measurements: HW: 100; HL: 80–82; UID: 55–56; LID: 34–36; AOD: 09–10; IAD: 11–12; OAD: 33–34; IOD: 15–16; OOD: 11–12; CL: 16–17; GW: 14–15; EW: 32–34; SL: 28–30; FL: 160–163.

Structure. Head broad, sculpture smooth, with a fine reticulate pattern, frons, clypeus and supraclypeal area impunctate; inner orbits converging strongly below; scape reaches well short of anterior margin of median ocellus. Pronotum dorsolateral angles broadly obtuse to rounded, weakly produced. Mesoseutum and scutellum dull, microtessellate, both impunctate. Dorsal surface of propodeum not defined by carinae, sculpture finely ruguloso-striolate, sculpture not reaching dorsal rim. Fore and mid leg tarsal segments laterally flanged.

Colour. Body black except antennal flagella suffused with dark brown; legs dark brown except tarsi light red-brown.

Vestiture. Body sparse except clypeus and lower paraocular areas with some erect, plumose hairs, genal hairs long, forming a “beard”, fore leg trochanters with dense cover of long, plumose hair, mid trochanters with some plumose hair, though not as long or cover as dense as vestiture on fore trochanters, mesoventral area with moderate cover of simple hair; lateral margins of fore tarsi with long hairs, branched only on outer surface of hair shaft.

Genitalia and associated sterna. (figs 10–12).

Distribution. Cape York Peninsula and north Queensland.

Etymology. The epithet is from “*pilosus*” meaning hairy and “*ignya*” referring to the upper section of the leg.

Remarks. *Homalictus pilosignya* shares with *H. atrus* fore leg vestiture (coxae and trochanters with dense cover of long, plumose hair and lateral margins of fore tarsi with long, simple hairs) and the rasp-like sculpture on the apicoventral surface of the genitalia volsellae but differs in the female mesoscutum and scutellum colour (*pilosignya* sooty black; *atrus* black) and male vestiture (*pilosignya* with plumose vestiture on fore trochanters only (*atrus* plumose vestiture on fore leg trochanters and all coxae), plumose hair absent on the mesoventral area (*atrus* plumose hair present) and the hairs branched on one side only of the lateral margins of the fore tarsi (*atrus* hairs simple).

Homalictus pilosignya belongs to a species-group (termed "blackburni" by Walker (1986) for Australian species only and "buccinus" by Pauly (1986) for Australian and non-Australian species) which contains over 50 species that occur in India, Sri Lanka, Viet Nam, Thailand, Malaysia, Indonesia, Philippines, New Guinea, Bismark Archipelago, Caroline, Bismarck and Solomon Islands, the New Hebrides and Australia (Pauly (1986)). This species-group forms a monophyletic clade defined by several synapomorphies (both sexes with apex of marginal cell terminating on wing margin, female lacking fore basitarsal outer apicolateral comb absent, male with genal vestiture long (forming a "beard"), flanged tarsal segments, and coxae and/or trochanters with plumose and elongated vestiture). Australian members of this clade (*H. atrus*, *H. blackburni*, *H. cassiaefloris*, *H. dampieri*, *H. eurhodopus*, *H. grossopedalis*, *H. latitarsis*, *H. maitlandi* and *H. pilosignya* sp. nov.) occur throughout the "Torresian" faunal province as defined by Main (1981), with the greatest species diversity found in north Queensland and Cape York Peninsula.

Homalictus (Homalictus) verticulus sp. nov.

Figures 13–14

Material examined. Holotype, ♀ Northern Territory, 12 km NNE of Borroloola (15°58'S, 136°21'E), 1 Nov 1975, J.C. Cardale, on *Terminalia volueris* R.Br. ex Brenth. (ANIC).

Paratype, 1♀, NT, 22 km WSW of Borroloola (16°08'S, 136°06'E), 2 Nov 1975, J.C. Cardale, caught in malaise trap. (ANIC).

Diagnosis. A member of the "urbanus" species-group; female with frons striate, inner orbits parallel to weakly diverging below, vertex long and broad (IOD = vertex length), genae enlarged (GW 1.3 x EW), pronotum dorsolateral angles large and acute, mesoscutum posterior half closely punctate except parapsidal areas densely punctate, dorsal surface of propodeum striate with several basal interconnectives.

Description of female. (measurements of holotype in bold) Body length: 4.85–5.01 mm; Forewing length: 1.05–1.06 mm; Head width: 1.53–1.65 mm. Relative head measurements: HW: 100; HL: 80–81; UID: 61–62; LID: 62; AOD: 22–23; IAD: 9–10; OAD: 35; IOD: 17–18; OOD: 18–19; CL: 15–16; GW: 26–27; EW: 20; SL: 39–40; FL: 72–74.

Structure. Head broad (fig. 13), inner orbits parallel to weakly diverging (in holotype) below, median frontal present, extends less than half-

way to median ocellus; eyes with sparse cover of minute setae. Scape not reaching anterior margin of median ocellus. Clypeus flat in side view, anterior margin straight, surface dull, anterior half with densely punctate with large, shallow punctures, remainder openly punctate with small puncture. supraclypeal area impunctate. Frons striate to level of anterior margin of lateral ocelli, areas lateral to median ocelli smooth, vertex long and broad (IOD = vertex length), striate, striae continue onto enlarged genae (fig. 14). Labrum basal area with 2 large tubercles on either side of midline. Pronotum dorsolateral angles large and acute. Mesoscutum surface dull, covered with a fine reticulate pattern, impunctate to sparsely punctate, remainder closely punctate except parapsidal areas densely punctate. Scutellum shining, sparsely to openly punctate, scutellum length longer than length of dorsal surface of propodeum. Dorsal surface of propodeum not defined by carinae, dorsal rim rounded and shining, sculpture striate with several interconnectives basally, lateral striae continue onto vertical surface. Mesepisternum and metepisternum coarsely striate. Hind basitibial plate apically rounded, inner hind tibial spur coarsely serrate with 3 large teeth.

Colour. Head dark blue/green, antennae brown, mandible amber, mesoscutum semi-metallic blue/green, scutellum blue, propodeum and metasoma black, legs brown.

Vestiture. Body sparse, except tomentose hair on pronotum dorsolateral areas, and mesoscutum anterolaterally, lateral margins of propodeum with long plumose hair; hind leg and ventral metasomal scopae as usual for the genus.

Distribution. Borroloola region, Northern Territory.

Etymology. The epithet is from "vertex", meaning top, and refers to the unusual nature of the vertex.

Remarks. *Homalictus verticulus* shares enlarged head characters with *H. ctenander* Michener but differs markedly in head, mesoscutum and propodeum sculpture patterns and body colour. It is most like *H. holochlorus* (Cockerell) in head sculpture characteristics, body size and colour but differs in the female by enlarged vertex and genae, prominent pronotum dorsolateral angles (acute distally), mesoscutum punctation (*verticulus*, mesially closely punctate, parapsidal areas densely punctate; *holochlorus* mesially openly punctate, parapsidal areas closely punctate) and sculpture on the propodeum (*verticulus*, striate; *holochlorus*, ruguloso-striolate).

Subgenus *Papualictus*

Homalictus (Papualictus) Michener, 1980: 8. Type species: *Homalictus megalochilus* Michener, 1980: 8 (by original designation) = *Homalictus lorentzi* (Friese), synonymy by Pauly (1986).

Diagnosis revised from Michener (1980). Both sexes with frons, vertex and genal area coarsely striate; frontal carina present between antennal bases; females with hind tibiae slender, not scarcely concave beneath, with hair of outer surface sparse and simple; males with head much broader than long (HW at least 1.2 x HL), clypeus low and transverse, about five times as wide as long, apical truncation concave, epistomal suture lateral to tentorial pit horizontal, mandibles enlarged and sickle shaped, shifted slightly posteriorly so that a triangular malar space is formed, pre-episternum elevated to form a rough vertical ridge.

Homalictus (Papualictus) megagnathus sp. nov.

Figures 15–19

Material examined. Holotype, ♂, Qld, Mt Webb Nat. Pk (15°04'S, 145°07'E), 27–30 Apr 1981, I.D. Naumann (ANIC; Genitalia removed and placed in vial on pin).

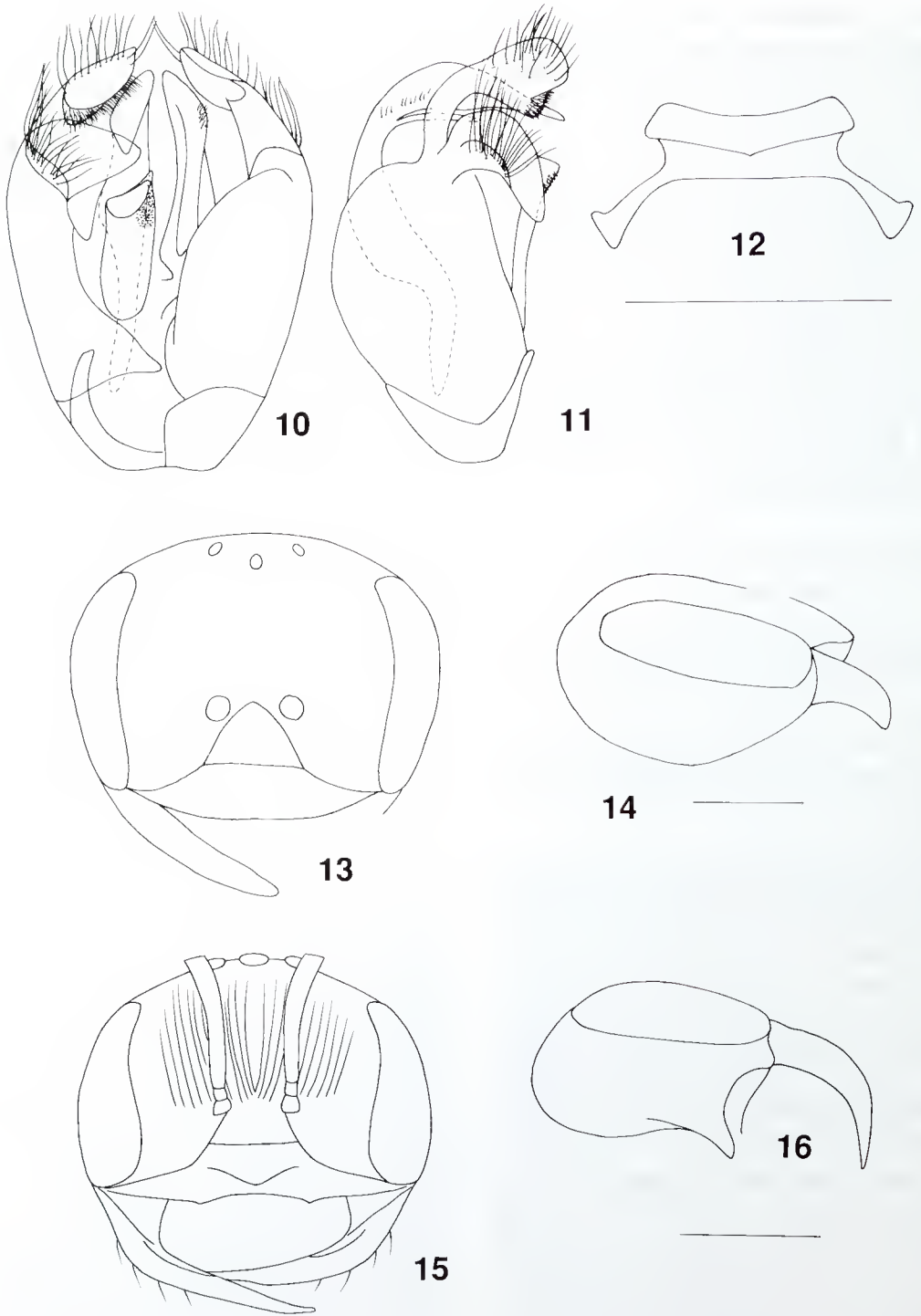
Paratypes. Qld: 1♂, 9 km ENE Mt Tozer (12°43'S, 143°17'E), 5–10 Jul 1986, J.C. Cardale, at MV light (ANIC); 1♀ 3 km ENE Mt Tozer (12°44'S, 143°14'E), 28 Jun–4 Jul 1986, J.C. Cardale, ex. Malaise trap/ethanol (ANIC).

Diagnosis. Female with frons, vertex and genae coarsely striate, anterior surface of hind tibia with hairs nearly simple, bristlelike or with 1 or 2 branches (no area with abundant, short, erect, plumose hairs as is usual for the genus); hind tibiae slender, under surface scarcely concave; male with head broader than long, clypeus short and transverse, apical truncation concave, anteromesial margin elevated as a large boss, underneath boss clypeus strongly concave, mandibles elongated and sickle shaped, shifted posteriorly; each gena with a large lamella-shaped process.

Description of male. (measurements of holotype in bold) Body length: 3.93–**4.24** mm; Forewing length: 0.66–**0.68** mm; Head width: 1.27–**1.29** mm. Relative head measurements: HW: 100; HL: **70–72**; UID: **62–64**; LID: **61–62**; AOD: **20–21**; IAD: **11–12**; OAD: **31–32**; IOD: **16–18**; OOD: **20–21**; CL: **10–12**; CW: **54–56**; GW: **21–22**; EW: **23–24**; SL: **37–38**; FL: **92–94**; ML: **62–64**.

Structure. Head broader than long (fig. 15), inner orbits weakly converging below to almost

parallel below, median frontal carina well developed, reaches half way to median ocellus. Clypeus smooth and shining, short and transverse, almost all of clypeus positioned above lower margins of eyes, apical truncation concave, only about one-fifth as wide as clypeus, anteromesial margin elevated as a large, rounded, forwardly projected rounded smooth shining boss, underneath boss clypeus strongly concave, epistomal suture lateral to tentorial pit horizontal. Supraclypeal area weakly elevated, covered with a fine reticulate pattern. Frons coarsely striate above antennal bases, sculpture continues to level of anterior margin of lateral ocelli, laterally continues almost to inner margin of eye. Mandibles shifted posteriorly so that anterior articulation is well behind lower inner margins of eyes, posterior articulation of mandibles shifted posteriorly to well behind lower outer margins of eyes, the shifted posterior mandibular articulation forms a small triangular malar space; mandibles elongated and sickle-shaped, longer than lower interorbital distance, apex of mandible rounded and weakly upturned, pollex absent. Labrum with rounded boss across the entire basal area, distally labrum rounded. Genal width, in side view, subequal to eye width, each gena with a single large, transversely broad, lamella-shaped process (fig. 16), processes originate on underside of genae slightly behind level of posterior mandibular articulation. Vertex broad and striate, slightly wider than interocellar distance. Pronotum dorsolaterally rounded, in side view lateral margin with distinct carina extending to dorsolateral angle. Pre-episternum, forward of pre-episternal groove, elevated to form rough vertical ridge; mesepisternum, above pleural signum, rounded and smooth; venter of mesepisternum without transverse ridge behind front coxae. Mesoscutum anterolateral margins raised forming a lip, mesially lip absent, anteriorly dull and impunctate, covered with a fine reticulate pattern, mesially and laterally shining though mesial area finely striate and openly punctate, parapsidal areas with a fine broadly reticulate pattern, sparsely punctate. Scutellum smooth and highly polished, sparsely punctate with minute punctures. Dorsal surface of propodeum not defined by carinae, smooth and polished except a few weak, short striae basally. Metasomal T1 highly polished and impunctate except for a few minute punctures, T2–T5 shining and impunctate except basally each tergite with several weak transverse lines. Fore basitarsal comb fan shaped; hind basitibial plate weakly present and apically acute.



Figures 10–16. *Homalictus* spp. *H. pilosignya* (paratype): male genitalia, fig. 10, ventral view (left half) and dorsal view (right half); fig. 11, lateral view; fig. 12, metasomal S7 and S8. *H. verticulus* (holotype): figs 13–14, head front and lateral views respectively. *H. megagnathus* (holotype): figs 15–16, head front and lateral views respectively. Scale lines (associated with each species) = 0.5 mm.

Colour. Body black except, clypeus, mandibles, antennal scapes and legs light red-brown, coxae black, femora suffused with dark brown, antennal flagellum brown.

Vestiture. Body sparse, frons and mesoseutum with sparse cover of erect hair, lower paraoxular areas with similar, though adpressed, hair, metasomal sternites with sparse cover of erect long and short plumose hair.

Genitalia and associated sterna. (figs 17–19).

Description of female. Body length: 4.47 mm; Forewing length: 1.08 mm; Head width: 1.36 mm. Relative head measurements: HW: 100; HL: 82; UID: 58; LID: 52; AOD: 18; IAD: 09; OAD: 34; IOD: 16; OOD: 16; CL: 18; GW: 14; EW: 26; SL: 42; FL: 82; ML: 36.

Structure. Agrees with description of male except as follows: Head with inner orbits converging below. Clypeus convex, sculpture openly punctate with shallow punctures, surface dull, covered with fine reticulate pattern except anterior margin smooth and shining. Supraclypeal area sculpture and punctation as on clypeus. Frons coarsely striate above antennal bases, ridges more prominent than in male. Mandibles less shifted posteriorly relative to eye than in male, malar area short, mandibles of ordinary size and form. Genal width, in side view, less than eye width, sculpture striate. Vertex striate, slightly narrower than interocellar distance. Pronotum dorsolateral angle acute, in side view lateral margin of pronotum with a ridge extending to dorsolateral angle, ridge less prominent than in male. Pre-episternum, forward of pre-episternal groove, weakly elevated to form a vertical ridge. Mesoseutum anterolateral margins as in male, surface dull, covered with a fine reticulate pattern, sculpture mesially closely punctate, in parapsidal areas openly punctate. Scutellum surface dull as on mesoscutum, sculpture openly to sparsely punctate. Dorsal surface of propodeum as in male except basal striae rugulose. Metasomal tergites as in male. Hind basitibial plate well developed, apically acute. Anterior surface of hind tibia with hairs nearly simple, bristlelike or with 1 or 2 branches (no area with abundant, short, erect, plumose hairs as is usual for the genus); hind tibiae slender, under surface scarcely concave. Inner margin of inner hind tibial spur with 2 or 3 apically rounded teeth.

Colour. As in male but with antennal scapes and flagella light red-brown infuscated with dark brown, mesoseutum dull coppery-green, scutellum with blue hue.

Vestiture. As in male but with metanotum with tomentum of short white hair; femoral and sternal scopa well developed, similar colour to legs.

Distribution. Cape York Peninsula and north Queensland.

Etymology. The epithet is from “*mega*” and “*gnathos*” and refers to the enlarged mandibles.

Remarks. *Homalictus (Papualictus)* was erected for five species found in the moderate to high altitudes of New Guinea, New Britain and New Ireland (Miehener, 1980). The discovery of *H. megagnathus* now extends its distribution into northern-east Australia. Miehener produced a diagnosis for *H. (Papualictus)* but noted that since males were not known for all described species, the male diagnostic characters “may not all actually be subgeneric attributes” (p. 8). Comparisons between the diagnostic characters of *H. (Papualictus)* and character states of *H. megagnathus* revealed the following differences. Body length was described as large for both sexes in *H. (Papualictus)*, but *H. megagnathus* is best termed small (♀: 8.5–11 mm, 10–11 mm; ♂ & ♂ < 4.5 mm, respectively). Body length is the only variable female subgeneric character. Male subgeneric characters differ as: Head ratio (width 1.2 × length; width 1.4 × length respectively); genal width (GW 2 × EW; GW almost equal to EW, respectively); pronotum dorsolateral angle large and distally acute versus small and rounded; and the following two characters do not occur on *H. megagnathus*: mesepisternum, above pleural signum, elevated to form a rough prominence; and dorsal surface of propodeum strongly elevated to form a shining, longitudinally elongate boss.

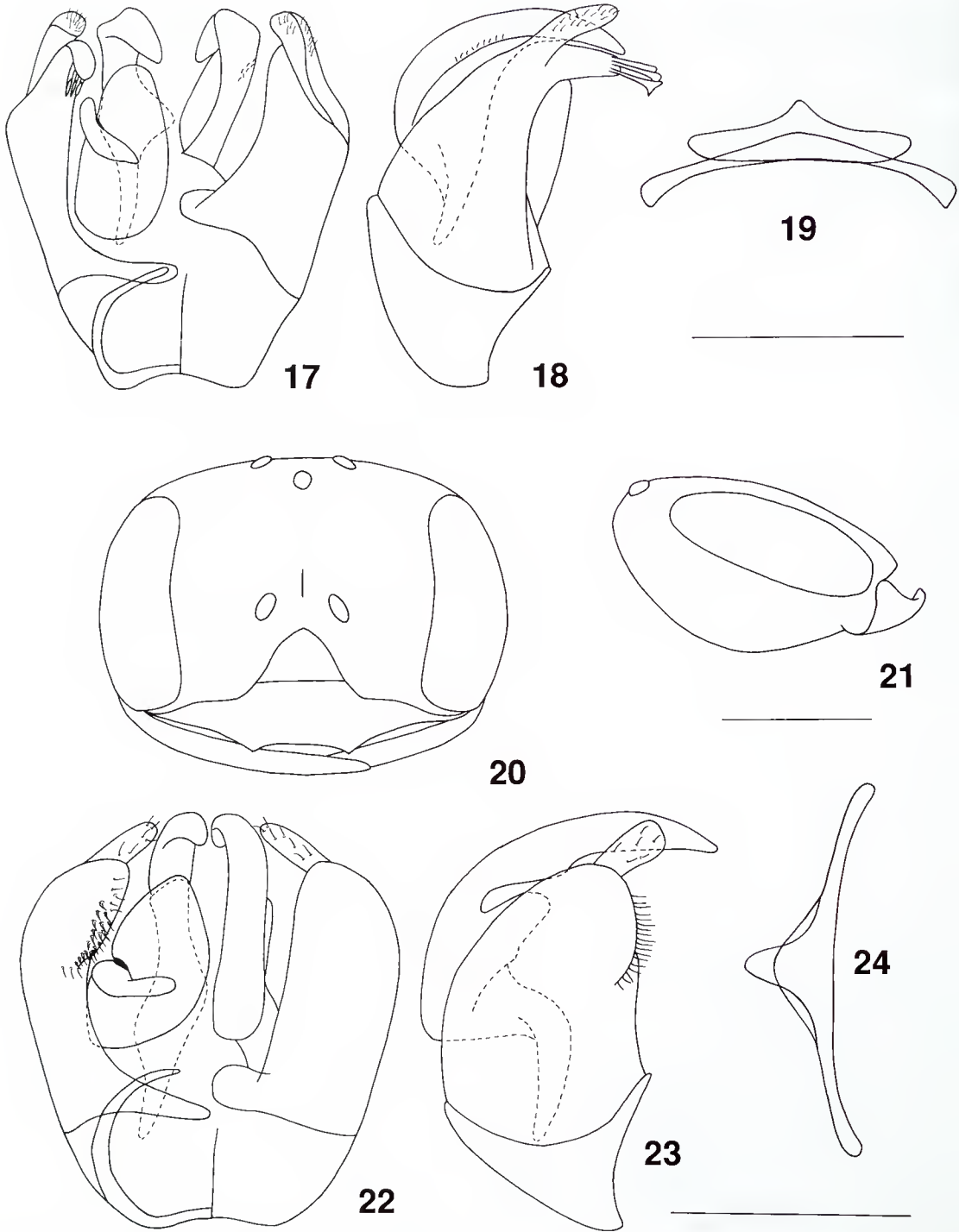
Subgeneric placement not resolved

Homalictus sicarius sp. nov.

Figures 20–24

Material examined. Holotype, ♂, Qld, 11 km NW of Bald Hill, Mellwraith Range (13°44'S, 143°20'E), 26 Jun–13 Jul, I.D. Naumann, at light, search party campsite (ANIC; genitalia removed and placed in vial on pin).

Diagnosis. Male with head and vertex broad (HW 1.5 × HL; vertex width 0.8 × IOD), median frontal carina present, clypeus low and transverse (CW 4.5 × CL), anteromesial margin concave, epistomal suture lateral to tentorial pit horizontal, frons weakly striate, genae area and vertex smooth, mandibles elongated (ML 0.9 ×



Figures 17–24. *Homalictus* spp. *H. megagnathus* (holotype): male genitalia, fig. 17, ventral view (left half), dorsal view (right half); fig. 18, lateral view; fig. 19, metasomal S7 and S8. *H. sicarius* (holotype): figs 20–21, head, front and lateral views respectively. Male genitalia: fig. 22, ventral view (left half) and dorsal view (right half); fig. 23, lateral view; fig. 24, metasomal S7 and S8. Scale lines (associated with each species) = 0.5 mm except figs 22–24 = 0.25mm.

LID), shifted posteriorly so that forming a small triangular malar space, GW subequal EW, pronotum dorsolateral angles obtuse, mesoscutum impunctate, dorsal surface of propodeum smooth.

Description of male. (female unknown) (measurements of holotype in bold). Body length: **4.16** mm; Forewing length: **0.96** mm; Head width: **1.25** mm. Relative head measurements: HW: 100; HL: **74**; UID: **62**; LID: **60**; AOD: **18**; IAD: **14**; OAD: **30**; IOD: **18**; OOD: **18**; CL: **15**; CW: **68**; GW: **22**; EW: **24**; SL: **38**; FL: **116**; ML: **56**.

Structure. Head broader than long (figs 20–21), inner orbits weakly converging below, median frontal carina present, reaches one third to median ocellus. Clypeus with a dull sheen, covered with a fine reticulate pattern, impunctate, short and transverse (CW $4.5 \times$ CL), almost half of clypeus positioned above lower margins of eyes, apical margin not truncate though anteromesial margin concave with lateral points forming small processes, epistomal suture lateral to tentorial pit horizontal. Supraclypeal area weakly elevated, covered with a fine reticulate pattern. Frons appears smooth though with weak striae above antennal bases, striae not reaching anterior margin of lateral ocelli, lateral margin smooth. Mandibles shifted posteriorly so that anterior articulation is behind lower inner margins of eyes, posterior articulation of mandibles shifted posteriorly to well behind lower outer margins of eyes, the shifted posterior mandibular articulation forms a small triangular malar space (fig. 21); mandibles elongate, weakly sickle-shaped, almost as long as lower interorbital distance, apex of mandible rounded, pollex absent. Genal width, in side view, subequal to eye width. Vertex broad (Vertex width $0.8 \times$ IOD) and smooth. Pronotum dorsolateral angles obtuse, in side view weakly elevated. Pre-episternum, forward of pre-episternal groove, not elevated to form rough vertical ridge; mesepisternum, above pleural signum, rounded and smooth; venter of mesepisternum without transverse ridge behind front coxae. Mesoscutum anterior margin rounded, entire surface dull and impunctate, covered with a fine reticulate pattern. Scutellum smooth, polished and impunctate. Dorsal surface of propodeum not defined by carinae, smooth and polished except a few weak, short striae basally. Metasomal terga polished and impunctate. Fore basitarsal comb fan shaped; hind basitibial plate well developed, apically acute.

Colour. Body black except, apical half of clypeus with metallic blue/red tinge, mandibles and basal one quarter of antennal scapes amber, antennal flagellar segment brown, coxae and femora brown, tibiae and tibiae and tarsi light red-brown suffused with dark brown.

Vestiture. Body sparse, frons and mesoscutum with sparse cover of erect hair, lower paracocular areas and clypeus with moderate cover of short plumose hair, metasomal sternites with sparse cover of erect long and short plumose hair.

Genitalia and associated sterna. (figs 22–24).

Distribution. Cape York Peninsula.

Etymology. The epithet is from “*sica*” meaning dagger and refers to the shape of the mandibles.

Remarks. Subgeneric placement of *H. sicarius* will require association of the female and examination of the full character suite. Several character states of the male suggest subgeneric placement in *H. (Papualictus)*. In particular the head ratio (HW $1.4 \times$ HL), clypeus low and transverse (clypeus width $4 \times$ CL), anteromesial margin concave, mandibles elongated, weakly sickle-shaped and with the posterior articulation slightly shifted posteriorly to form a small triangular malar space. However, comparison with my diagnosis of *H. (Papualictus)* (Walker, 1986) highlighted the following differences: frons, vertex and genae not striate, the clypeus apical margin not truncate and concave beneath, not forming an elevated boss, mandible length less than LID and pre-episternum not elevated to form a rough vertical ridge. I considered this single male specimen warranted description to flag a second Australian species that possesses a number of subgeneric male head characters of *H. (Papualictus)* and may eventually be placed in that subgenus.

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