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REVISION OF THE AUSTRALIAN SPECIES OF THE GENUS *HOMALICTUS* COCKERELL (HYMENOPTERA: HALICTIDAE)

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Abstract

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Australian members of the genus *Homalictus* Cockerell are revised. A total of 39 species, 10 of them new, are recognised. Identification keys, diagnoses, descriptions or redescriptions are provided for all but one species. Distribution patterns are outlined and notes are provided on nesting behaviour, flowers visited and parasites. The genus *Homalictus* is redescribed and the synonymy of the subgenus *Indohalictus* Blüthgen is discussed. A new subgenus, *Quasilictus* , is erected to accommodate the new species *H. brevicornutus* . The following are considered to be new synonyms: *H. formosus* (Rayment), *H. formosulus* Michener of *H. bremerensis* (Rayment); *H. botanicus* (Rayment), *H. portlandicus* (Rayment) of *H. brisbanensis* (Cockerell); *H. rufoaeneus* (Friese), *H. viridinitens* (Friese) of *H. caloundrensis* (Cockerell); *H. occidentalis* (Rayment), *H. codenticalis* (Rayment) of *H. dotatus* (Cockerell); *H. hilli* (Cockerell) of *H. flindersi* (Cockerell); *H. dixoni* (Rayment), *H. hentyi* (Rayment), *H. sevillensis* (Rayment) of *H. megastigmus* (Cockerell); *H. oxoniellus* (Cockerell), *H. mesocyaneus* (Cockerell), *H. raymenti* (Cockerell), *H. tarltoni* (Cockerell), *H. aureoazureus* (Rayment), *H. littoralis* (Rayment) of *H. niveifrons* (Cockerell); *H. exlautus* (Cockerell), *H. hedleyi* (Cockerell), *H. pallidifrons* (Rayment), *H. subpallidifrons* (Rayment), *H. phillipensis* (Rayment) of *H. punctatus* (Smith); *H. limatus* (Smith), *H. humilis* (Smith), *H. burkei* (Cockerell), *H. demissus* (Cockerell), *H. limatiformis* (Cockerell), *H. humiliformis* (Cockerell) of *H. sphecodoides* (Smith); *H. eyrei* (Cockerell), *H. darwinensis* (Cockerell) of *H. sphecodopsis* (Cockerell); *H. saycei* (Cockerell) of *H. tatei* (Cockerell); *H. baudinensis* (Cockerell), *H. kesteveni* (Cockerell), *H. hackeriellus* (Cockerell), *H. pavonellus* (Cockerell), *H. olivinus* (Cockerell), *H. lomatiae* (Cockerell), *H. microchalceus* (Cockerell), *H. subcarus* (Cockerell), *H. williamsi* (Cockerell), *H. suburbanus* (Cockerell) of *H. urbanus* (Smith); *H. transvolans* (Cockerell) of *H. woodsi* (Cockerell). Ten new species are described: *H. atrus, H. brevicornutus, H. exleyae, H. exophthalmus, H. forrestae, H. grossopedalus, H. houstoni, H. imitatus, H. multicavus* and *H. pectinalus* . Males of the following species are described for the first time: *H. behri* (Cockerell); *H. bremerensis; H. callaspis* (Cockerell); *H. caloundrensis; H. cassiaefloris; H. dotatus; H. eurhodopus* (Cockerell); *H. megastigmus; H. murrayi* (Cockerell); *H. scrupulosus* (Cockerell); *H. sphecodoides; H. stradbrokensis* (Cockerell); and *H. tatei. Halictus littoralis* Rayment, 1935 is recognised as a homonym of *H. littoralis* Blüthgen, 1923. *Homalictus appositus* (Rayment) and *H. purpureus* (Rayment) are assigned to *Lasioglossum (Chilalictus)*. Lectotypes have been selected for the following species: *H. cassiaefloris, H. indigoteus, H. niveifrons, H. rowlandi* (Cockerell), *H. saycei, H. urbanus*, and *H. viridinitens.*

Introduction

Bees of the genus *Homalictus* Cockerell are found from Sri Lanka and south-east Asia, eastward across the Pacific to the islands of Marianas and Samoa, although their centre of abundance is in Australia (Michener, 1965; 1980a). Within Australia they occur in all faunal provinces and are most prevalent around flowers of the plant family Myrtaceae. They are not, however, restricted to this family as the floral records show (see Biology).

Cockerell (1919a: 13) erected the subgenus *Homalictus* for three Philippine species of *Halictus* in which "males resembled the females". Michener (1965) concluded that the genus *Halictus* did not occur in the Malayan region, East Indies or Australia and reassigned all *Halictus* species in these areas to *Homalictus* and *Lasioglossum*. Most of the Australian "Halictus" described under the subgenus *Chloralictus* were placed in *Homalictus* (raised to generic rank by Michener) and *Lasioglossum (Chilalictus)*.

Blüthgen (1931: 291) introduced the subgenus *Indohalictus* for certain *Halictus* in the Indomalayan region. Krombein (1951) and Pauly (1980) used this taxon for halictids of the Solomon and Indomalayan Islands respectively and provided additional characters to aid subgeneric recognition. Michener (1965) synonymised the subgenus and (1980a) again commented that every character used showed intergradation with *Homalictus* proper, in particular when applied to the Australian situation.

The first Australian species of *Homalictus* was described (in *Halictus*) by Smith in 1853. Since that time, Cockerell, Friese, Rayment and Michener have described further species with most described by Cockerell from 1905 to 1930. Cockerell (1933) produced a key to all Australian "*Halictus*" and provided the last comprehensive review of the species.

Institutions and collections

The following abbreviations are used for museums and other institutions holding specimens examined in this study.

AMNH	American Museum of Natural History, New York
ANIC	Australian National Insect Collection, Canberra
Berlin	Institut für Spezielle Zoologie und Zoologisches Museum der Humbolt Universitat, Berlin
BPBM	Bernice P. Bishop Museum, Honolulu, Hawaii, USA
BMNH	British Museum (Natural History), London
CAS	California Academy of Sciences, San Francisco
HNHM	Hungarian Natural History Museum, Budapest
MCZ	Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA
MZUS	Musée Zoologique de l'Université, Strasbourg
USNM	National Museum of Natural History, Smithsonian Institution, Washington, DC, USA
NMV	Museum of Victoria, Division of Natural History, Melbourne, Victoria
QDPI	Queensland Department of Primary Industries, Brisbane and Mareeba, Queensland
QM	Queensland Museum, Brisbane, Queensland
UQIC	University of Queensland Insect Collection, Brisbane, Queensland
SAM	South Australian Museum, Adelaide, South Australia
WAM	Western Australian Museum, Perth, Western Australia

Terminology, methods and measurements

The terminology used in descriptions follows Michener (1965) except that the apparent abdomen is called gaster, not metasoma. The basitarsal comb is defined as a row of setae distinct from the surrounding vestiture, along the outer apical margin of each fore basitarsus.

The sexes were associated on the basis of morphological similarity and coincident collection data. None were taken in copula.

For detailed studies on the labrum, galeae, genitalia and gastral sternum VI, these were dissected from the specimens, boiled in 10% (w/v) KOH for approximately 30 minutes, passed through two water washes, acidulated in glacial acetic acid and transferred to a drop of glycerine on a slide. The dissections were preserved in glycerine in microvials attached to the specimen pin.

All drawings were done by the author using a Wild M7 binocular and a Wild 20EB compound microscope. Head, scutal and propodeal drawings were done on the binocular using a squared grid; genitalic and gastral sternum VI drawings on the compound using a camera lucida.

Measurements were made from dried, pinned material using a micrometer eyepiece. Apart from the body length and forewing length (expressed in millimetres), all measurements are relative.

The following abbreviations are used in the text:

BP: Hind basitibial plate
TS: Inner tibial spur on hind leg

Distances:
BL: Body length: distance from antennal sockets to posterior end of gaster
FL: Forewing length: proximal end of costal vein to distal tip of wing
AOD: Antennocular distance: shortest distance from inner eye margin to rim of antennal socket
IAD: Interantennal distance: shortest distance between inner margins of antennal sockets
OAD: Ocellantennal distance: shortest distance between posterior margin of antennal socket and anterior margin of median ocellus
IOD: Interocellar distance: shortest distance between inner margins of rear ocelli
OOD: Ocellocular distance: shortest distance between upper inner margin of eye and ipsilateral rear ocellus
UID: Upper interorbital distance: shortest distance between upper inner margins of eyes
LID: Lower interorbital distance: shortest distance between lower inner margins of eyes

Ratios:
Fg:UID: Ratio of flagellum length to upper interorbital distance in males only
EW:GW: In side view, ratio of greatest width of eye to greatest width of gena

Punctation abbreviations

dense: Interspaces between punctures less than diameter of 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.

Phenological data (PD)

Months of the year are represented in numerical order, e.g., 1–January; 12–December.

Floral Record (FR)

Biology

Nesting

Information on the nesting behaviour is scanty. Rayment (1935) and Knerer and Schwarz (1976) produced nest diagrams of several species of *Homalictus* but provided little information on colony size or behaviour. Dr T.F. Houston (WAM) has supplied the following notes on *Homalictus* nests and behaviour.

"–Tusmore (Adelaide suburb), 24 Dec. 1965, *Homalictus urbanus* (SAM).

Two nest entrances were found in hard, flat, bare soil near a shed. Females were busy trafficking to and fro. At one stage, 22 females were counted entering a nest before a single

female departed. Many carried pollen. 26 Dec. Small ants attacking one entrance had caused a build up of returning females which hovered around. I killed and removed all ants and at once the bees began entering. 54 were counted entering before one emerged.

At the other entrance, when bee traffic was busy, I placed an aluminium foil disc with a central hole over it. This permitted bees to exit but deterred them from entering. 80 females were counted leaving without any others entering. When the disc was removed, 80 females entered in a space of a few minutes and most (if not all) carried pollen. As insufficient time to collect a pollen load had elapsed between departure of the first females (when the disc was put on) and entry of females, two separate lots of 80 would have been counted. Thus the nest was inhabited by at least 160 females.

–Near Beerburrum, Qld. 10 July, 1968.

Several cells found in soil between roots of fallen eucalypt tree. Nest identified by dead female in one cell.

–Mt Davies Bore, N.W. South Australia. 20 Oct., 1972.

Numerous females found entering and leaving a single entrance amongst leaf litter on creek bank. Soil was sandy loam, dry down to 65 cm where it became moist. Shaft was smooth and regular but unlined. It followed an irregular path down to the moist zone where it was lost. Several branches were also lost before being traced more than a few cm. Adult bees were found in all tunnels. Many escaped but 55 females and 2 males were captured. Only one cell was found (110 cm depth). It was empty and had smooth polished walls. None of the females entering the nest appeared to carry pollen. (*H. urbanus* det. author; specimens in WAM)

–Victory Well, Everard Park Stn, South Australia. 25th Oct., 1972.

I dug a garbage pit in flat sandy loam in the late afternoon. Later numerous halictids were found hovering in the pit and some entered small holes and did not re-emerge. Next morning many more bees were hovering in the pit. A section of the pit wall was excavated. Numerous short tunnels were opened containing one to several females but no cells were found. None of the flying females carried pollen. Most of the bees were *Homalictus* (*H. dotatus* det. author; specimens in WAM) but a few were *Lasioglossum (Chilalictus)*.

–Coward Springs, N.W. of Marree, South Australia. 28th Oct., 1972.

Numerous nest entrances were found in a flat area of ground adjacent to a small stream flowing from a mound spring. Most entrances were concealed beneath small lumps of sand crust but two were in the side of a soil lump. One of these was excavated.

The sand had a dry crust but was damp and cheesy below. The shafts extended vertically to 20 cm depth and had several lateral burrows, mainly at 9-13 cm depth. About 10 females escaped from these burrows but 3 were captured to enable identification. Numerous cells were found between 9-14 cm depth. They were ovoid and more or less horizontal, with smooth, shiny internal walls but were not separable from the surrounding soil. Some were open and being provisioned while others were sealed and contained pollen balls and eggs, small feeding larvae or mature larvae. Pollen balls were subspherical, moist and soft. At least 5 linear cell pairs separated by soil plugs were found. (*H. urbanus* det. author; specimens in SAM)

The internal surfaces of *Homalictus* cells were polished to a degree that they appeared to be wax-lined as is usual amongst halictid bees." The author has found few nest sites but has observed the following: - Anglesea (Victoria), 20 March 1982.

Numerous nest entrances in clay soil on the vertical surfaces of both sides of a boat ramp. Most were *Lasioglossum (Chilalictus)* spp. with *Homalictus sphecodoides* intermixed. Little activity was seen at any nest. A mutillid wasp was observed walking over the nesting site but did not enter nests. In the late afternoon, a number of males of *H. sphecodoides* were seen clinging onto tall grass stems approximately 6 meters from the nest site. Males were randomly positioned throughout the clump of grass and showed no signs of aggregating.

–Sandringham (Victoria), 3 March 1985.

Three single nest sites (each at least 1 metre

apart) were observed in bare areas of white clay soil. The nests were found by spotting swarming clusters of about 20 to 30 males hovering a few centimetres above the nest entrance. At one entrance, three females (without a pollen load) were seen entering – these were not disturbed by the males. Species identified as *H. urbanus*

The nesting observations indicate that *Homalictus* has a communal nesting behaviour similar to that recorded by Cardale and Turner (1966) for *Lasioglossum (Chilalictus) leai*. From the observations provided by Houston and those made on *L. (Chilalictus)* (author's unpublished notes and Schwarz pers. comm.), a number of differences between the nesting behaviour of both genera are worth noting.

The number of females using a single nest entrance varies markedly between genera. Cardale and Turner (1966) recorded between 2 and 23 bees in each nest and the author has found less than 20 bees in nests of *Lasioglossum (Chilalictus)*. Houston observed at least 160 females using the single entrance in the Tusmore nest and other nests of *Homalictus* have contained at least 30 females (Schwarz pers. comm.).

Rayment (1935), Schwarz (pers. comm.) and Walker (unpublished notes) have all observed female guards at the entrances to nests of *Lasioglossum (Chilalictus)* spp.. Flightless macrocephalic males of *Lasioglossum (Chilalictus) erythrurum* in artificial nests have also been observed acting as guards (Schwarz, pers. comm). To date no such female guard bee behaviour or flightless macrocephalic males have been recorded for *Homalictus*.

Brood cells of *Homalictus* usually occur singly at the end of lateral tunnels. Cells of *L. (C.) erythrurum* are often clustered in groups of 8 to 10 and may be lifted out of the soil attached to each other. This is not the case for all *L. (Chilalictus)*. Single cells or linear series of cells (pers. obs.) at the end of lateral tunnels are usual for *L. (C.) lanarium* although the main tunnel shaft of these bees is straight whereas in *Homalictus* and other *L. (Chilalictus)* the main shaft is multi-branched (Schwarz pers. comm.).

Floral Records

Following is a list of flowers visited by *Homalictus* specimens examined in this study. The families and genera within families are presented in alphabetical order and the data from all records has been compiled and incorporated with the following list. These results should not be used to determine oligolectic species, but do indicate a preference of *Homalictus* for the Myrtaceae plant family. The data are presented as such–Family (% visited expressed as: total number of family records/total number of all family records): Genus (number of species of *Homalictus* recorded).

Aizoaceae (>1.0%): *Mesembryanthemum* (1 sp.). Anacardiaceae (1.7%): *Schinus* (3 spp.). Amaranthaceae (>1.0%): *Ptilotus* (1 sp.). Asteraceae (>1.0%): *Helichrysum* (1 sp.). Boraginaceae (>1.0%): *Tournefortia* (1 sp.). Caesalpiniaceae (1.2%): *Cassia* (2 spp.). Campanulaceae (1.4%): *Wahlenbergia* (2 spp.). Chrysobalanaceae (>1.0%): *Parinari* (1 sp.). Combretaceae (2.9%): *Terminalia* (5 spp.). Compositae (2.9%): *Artopheca* (1 sp.), *Helipterum* (1 sp.), *Hypochoeris* (1 sp.), *Ixodea* (1 sp.), *Osteospermum* (1 sp.). Dilleniaceae (>1.0%): *Hibbertia* (1 sp.). Epacridaceae (>1.0%): *Leucopogon* (1 sp.). Euphorbiaceae (1.2%): *Claoxylon* (1 sp.), *Securinega* (1 sp.). Frankeniaceae (>1.0%): *Frankenia* (1 sp.). Goodeniaceae (1.7%): *Goodenia* (1 sp.), *Scaevola* (1 sp.), *Velleia* (1 sp.). Gyrostemonaceae (>1.0%): *Codonocarpus* (1 sp.). Haemodoraceae (>1.0%): *Anigozanthos* (1 sp.). Hydrocotylaceae (>1.0%): *Trachymene* (1 sp.). Labiatae (>1.0%): *Dysophylla* (1 sp.). Loranthaceae (3.4%): *Amyema* (6 spp.). Malvaceae (1.2%): *Hibiscus* (1 sp.), *Lagunaria* (1 sp.). Mimosaceae (4.0%): *Acacia* (7 spp.). Myoporaceae (2.9%): *Eremophila* (4 spp.), *Myoporum* (1 spp.). Myrtaceae (43.8%): *Angophora* (7 spp.), *Callistemon* (4 spp.), *Calothamnus* (1 sp.), *Calytrix* (1 sp.), *Eucalyptus* (22 spp.), *Eugenia* (4 spp.), *Leptospermum* (7 spp.), *Melaleuca* (12 spp.), *Syncarpia* (2 spp.), *Syzygium* (1 sp.), *Thryptomene* (5 spp.), *Tristanopsis* (10 spp). Onagraceae (>1.0%): *Oenothera* (1 sp.). Papilionaceae (4.0%): *Dalbergia* (1 sp.), *Daviesia* (1 sp.),

Dillwynia (1 sp.), *Gastrolobium* (1 sp.), *Hardenbergia* (1 sp.), *Jacksonia* (1 sp.), *Pongamia* (1 sp.), *Swainsonia* (1 sp.). Pittosporaceae (3.4%): *Bursaria* (4 spp.), *Pittosporum* (2 spp.). Portulacaceae (1.2%): *Calandrina* (2 spp). Proteaceae (4.0%): *Banksia* (1 sp.), *Grevillea* (1 sp.), *Hakea* (1 sp.), *Lomatia* (2 spp.). Ranunculaceae (>1.0%): *Ranunculus* (1 sp.). Rhamnaceae (>1.0%): *Alphitonia* (1 sp.). Rosaceae (1.2%): *Cotoneaster* (1 sp.), *Malus* (1 sp.). Rubiaceae (1.7%): *Borreria* (2 spp.), *Canthium* (1 sp.). Rutaceae (>1.0%): *Boronia* (1 sp.). Santalaceae (>1.0%): *Eucarya* (1 sp.). Sapindaceae (4.0%): *Atalaya* (6 spp.), *Heterodendron* (1 sp.). Scrophulariaceae (>1.0%): *Morgania* (1 sp.). Sterculiaceae (2.3%): *Brachychiton* (2 spp.), *Keraudrenia* (1 sp.), *Lasiopetalum* (1 sp.). Strelitziaceae (>1.0%): *Strelitzia* (1 sp.). Tremandraceae (>1.0%): *Tetratheca* (1 sp.). Violaceae (>1.0%): *Dioceirea* (1 sp.). Xanthorrhoeaceae (2.3%): *Xanthorrhoea* (4 spp).

The floral record illustrates the diversity of *Homalictus* forage plants (78 genera). Most of these records represent a single collection in a particular area and therefore the species floral record is partially dependent on what was in flower at that time. An accurate floral record would require repeated visits to the same areas at different times of the year. *Homalictus ctenander* is the only species to show a preference for a plant family other than Myrtaceae. Most of the 85 specimens examined were captured on *Amyema* (Loranthaceae). The remainder, however, were recorded on eight different plant families (including Myrtaceae).

Phenological Data

Phenological data is included with each species description. Restricted activity periods should not be inferred from this data as many records represent single catches at a given locality or the species is known from few specimens. In general, apart from the cold winter months, particularly in the south central and south east parts of Australia, *Homalictus* spp. have been recorded flying in most months of the year.

Parasites and associated organisms

Strepsiptera: Evidence of parasitic attack b Strepsiptera on the gaster of adult *Homalictu* was found on a number of specimens: all had single strepsipteran on the dorsal surface of th gaster between the fourth and fifth terga (ex cept for one between the fifth and sixth terga).

Acarina: Large numbers of hypopia nymphs were found on the bodies of som *Homalictus* adults. The mites belonged to the Sarcoptiformes, family Saproglyphidae, an were positioned on the bees in areas (ofte forming layers on top of each other) that woul be difficult to clean. The most favoured positions were the vertical posterior surface of the propodeum and on the gastral tergum I. Others were found in the folds at the bases of the wings, on the sides of the propodeum, dorsally on the pronotum and concealed beneath the hind margins of the gastral terga.

Homalictus Cockerell

Figures 1-27

Homalictus Cockerell, 1919a: 13.–Krombein, 1950: 109-10.–1951: 279.–Michener, 1965: 177-81.–1978: 310-11.–1979: 227-9.–1980a: 1-3.–1980b: 423.–Pauly, 1980:–11-15.–Walker, 1981: 32-4.

'Halicti nomioidiformes' Blüthgen, 1926: 465-7.

Indohalictus Blüthgen, 1931: 291.–Krombein, 1951: 279.–syn. by Michener, 1965: 178.–1980a: 2.–Pauly, 1980: 11-15.–Walker, 1981: 35-41.

Diagnosis. Gastral terga of female sharply folded laterally forming a distinct angle at margin between dorsal and ventral surfaces; scopal hairs always plumose (never branched) (cf. Figs 5b-g, e-g); gastral scopa comprised of sternal and tergal hair, sternal hair arranged in single or double transverse rows, hair apically plumose, tergal hair arranged in tufts, not forming transverse rows, shorter than sternal hair of corresponding segment, hair plumose along entire length; femoral scopal hair entirely plumose, originating at basal and apical areas on ventral surface of femora, hairs curved and overlap ventrally (Fig. 5i) (never originating along dorsal surface as in *Lasioglossum* s.lat., Fig. 5h); both sexes with comb of short spines on distal margin of galea (Fig. 5a);

male genitalia with gonobase continuing contours of gonocoxite (Figs. 13-23).

Differs from *Lasioglossum* s.lat. in: Female–(Scopal structure and position) *Homalictus* scopal hair comprises a central shaft along which lateral branches occur (plumose)(Figs. 5b-d), in *Lasioglossum* a basal shaft divides apically into several strands (branched)(Figs. 5e-g). (Primary pollen collecting site) *Homalictus*: gastral scopa; *Lasioglossum*: femoral scopae (cf. Figs. 5h, i). Male– The only diagnostic characters are those mentioned above. However, several other characters will aid separation. Gastral tergum I of *Homalictus* is impunctate except for minute punctures mesially on *H. urbanus*, *H. forrestae* and *H. murrayi*; gastral tergum I of *Lasioglossum* s.lat. is punctate across the entire surface except impunctate in *L. (Austrevylaeus* Michener) (distinguished by second transverse cubital vein narrower than first) and *L. (Australictus)* Michener) (distinguished by coarse reticulation on tergum I and lack of BP). Most (if not all) *Lasioglossum* s.lat. have yellow or white markings on the clypeus; in *Homalictus* only species of the 'dotatus' and 'blackburni' species-groups have similar markings. Apical margin of gastral tergum VII is broad and bilobed in *Lasioglossum* s.lat.; narrow and unilobed in *Homalictus*.

Type species. Halictus taclobanensis Cockerell, 1915b: 488. (by original designation)

Cladistic relationships

Characters utilized in the cladogram (Fig. 1) are listed in Appendix 1.

(1) Inter-generic relationships.

Within the non-parasitic Halictinae, *Homalictus* and *Lasioglossum* are considered to form a monophyletic group based on the inferred synapomorphies of presence of prepygidial fimbria divided by a longitudinal median furrow, the third transverse cubital vein weaker than the first and the labral process of the female posseses a longitudinal keel.

The genus *Nomioides* appears to be the sister-group of these two genera. All share the synapomorphic characters of pre-episternal groove continuing below the scrobal groove and the third submarginal cell being shorter than the first submarginal cell. *Nomioides* has two autapomorphic characters of inner margins of eyes emarginate and presence of flattened, spatulate hairs on gastral sternum III (Yeates, 1981). This genus was used as the out-group for polarising character states used in construction of a cladogram for *Homalictus* (Fig. 1).

During construction of the *Homalictus* cladogram, a number of synapomorphic characters showed homoplasy within *Homalictus* and *Lasioglossum* s.lat.. These characters have not been rejected (in opposition to Hennig, 1965) for use in the cladogram. To reject them would involve identifing them a priori in their reconstructed phylogeny and such identity would be dependent on low resolving power. The resultant analysis would be very weak (Wiley, 1981).

Lasioglossum s.lat. consists of eight subgenera which are united to form a monophyletic group by the synapomorphic characters of female gastral terga rounded laterally without a distinct angle separating ventral and dorsal parts, and male genitalia large and broad with the contours of the gonobase not continuing those of the gonocoxites. The homoplasy of synapomorphic characters between these subgenera and *Homalictus* is as follows.

Male. Three characters (two genitalic) show homoplasy with *Lasioglossum* s.lat.. Genitalia with large ventroapical projections (character 13) is synapomorphic in most *Homalictus* except the '*urbanus*' species-group and the subgenera *H. (Quasilictus)* and *(Papualictus)* and is homoplastic in the subgenera *Australictus*, *Chilalictus*, *Nesohalictus*, *Callalictus* and *Parasphecodes* of *Lasioglossum*. The long gonostyli (23) on the genital capsule occurs in only one species-group ('*blackburni*') of *Homalictus* but is also a synapomorphy for the subgenera *Chilalictus*, *Glossalictus* and *Nesohalictus* of *Lasioglossum*. An incomplete hind basitibial plate (32) is a synapomorphy of several members within a species-group ('*flindersi*') of *Homalictus* and homoplastic for three

subgenera of *Lasioglossum* (*Australictus*, *Callalictus* and *Parasphecodes*).

Female. The character, fore basitarsal comb absent (22) is a presumed synapomorphy of the *Homalictus* '*blackburni*' species-group. The out-group used (*Nomioides*) also lacked this character but the presence of a comb in most of the remainder of the family Halictidae suggests that this state is independently derived in the two groups and in *Lasioglossum (Lasioglossum)*. The dorsal surface of the propodeum defined by carinae (18) is synapomorphic for the *Homalictus* '*flindersi*' species-group and converges with *Lasioglossum (Parasphecodes)*.

Both sexes. The autapomorphy of presence of a tomentum (7) found only in the new subgenus *H. (Quasilictus)* is convergent with the subgenera *Australictus*, *Chilalictus*, *Lasioglossum* and *Pseudochilalictus* of *Lasioglossum*. Character 30, gastral tergum I pitted across the entire surface, is a synapomorphy of two *Homalictus* species (*H. behri* and *H. thor*) and shows homoplasy with all *Lasioglossum* subgenera except *L. (Australictus)* and *L. (Austrevylaeus)*.

The degree of homoplasy between *Homalictus* and *Lasioglossum* highlights the extent of phenetic similarity between the two genera; however, the cladistic analysis further justifies Michener's (1965) decision for separation.

(2) Intra-generic relationships.

The cladogram (Fig. 1) presents a reasoned hypothesis for the phylogenetic relationships within the genus *Homalictus*. The current analysis is based totally on adult morphological characters and the employment of traits at different levels in the cladogram that are not independent but simply increasingly derived states of the same feature (e.g., 36 and 39). It was constructed on 85 characters (listed in Appendix 1), eleven of which (13%) show homoplasy (in particular parallelism). These parallel characters mainly define species and eight of them are sculpture characters. In such characters, species display only a limited number of independently derived states–e.g., Frons sculpture: plesiomorphic state–smooth; independently derived states–reticulate; granulate; or vertical striae. Homoplastic sculpture characters are rarely autapomorphic, rather synapomorphic for members within a species-group. Throckmorton (1962) argued that sharing of a particular character by two species indicates only that they are derived from some common heterozygous population. Such parallel characters may often be expected to be the rule rather than the exception and should be exploited in the construction of primary groups in cladograms.

The proposed cladogram (see Fig. 1) for *Homalictus* is discussed only to the species-group level.

Homalictus differentiated into two sister-groups A and B, with the majority of species in group B. Group A is distinguished by the synapomorphic feature of both sexes subequal in size (character 6) and retained the symplesiomorphic state of hind leg character 5. It contains the two subgenera *H. (Quasilictus)*, with autapomorphic characters 7-9, and *H. (Papualictus)* with synapomorphic characters 10-12. The cladogram for *H. (Papualictus)* was not completed as the subgenus is not represented in Australia.

The synapomorphies of group B are a robust hind tibiae (4) and an area of differentiated hair on the outer surface of the hind tibiae (5). The two branches of B, sister-groups C and D, each have their own synapomorphies. Group C ('*flindersi*', '*sphecodoides*', '*blackburni*' and '*dotatus*' species-groups) is distinguished by ventroapical processes on the male gonocoxites (13); group D ('*urbanus*' species-group) is characterised by male gastral sternum VI with small inverted 'v' projections (14) and labrum with two raised tubercles (15). These synapomorphic characters unite the '*urbanus*' species-group as a clade.

Homalictus rowlandi has been arbitrarily placed along the '*urbanus*' species-group branch. This species is known from only three females and could not be confidently placed into any of the five species-groups. The sister-group C of the '*urbanus*' species-group has a synapomorphy of a male genitalic character and as the male of *H. rowlandi* is unknown, it was thought unwise to speculate on such a character.

Group C divides into the two sister-groups E and F. Group E ('*flindersi*' species-group) is distinguished and forms a clade by the synapomorphies of dorsal surface of the propodeum defined by carinae (18) and the contours of the frons not continuing those of the clypeus (17). Both synapomorphic characters show homoplasy with the subgenus *H. (Quasilictus)*. Within the '*flindersi*' species-group, *H. callaspis* demonstrates a reversal of character 18. The dorsal surface of the propodeum is not defined by carinae, however, weak remnants of carinae are visible on the posterior lateral corners of the dorsal surface. Such remnants are not present in other lineages.

Group F is distinguished by the synapomorphy of a median tubercle, on the labrum, defined by a carina (16). It then divides into two sister-groups, one (G) containing the '*sphecodoides*' and '*blackburni*' species-groups characterised on the synapomorphy of head and propodeum black (21) and the other (H) to the '*dotatus*' species-group clade. This latter clade is distinguished by the synapomorphies of male gastral sternum VI with thickened spines (19) and in both sexes the basal margin of the second submarginal cell is obtusely bent to receive the first recurrent vein (20).

The synapomorphies of the two branches of G, sister-groups I and J, form clades of the '*sphecodoides*' and '*blackburni*' species-groups respectively. Group I is distinguished by the synapomorphic character of male gonocoxal processes with long, simple, tapering setae (25); group J has the synapomorphies of fore basitarsal comb of females absent (polarity previously discussed) (22), male genitalia with long gonostyli (23) and the genae of males possess long, branched hair (24).

Most of the species within each of the five species-groups are united on the basis of various synapomorphic characters or are differentiated by an autapomorphic character and are not further discussed here. The exception occurs within the '*flindersi*' species-group where no synapomorphic character could be inferred to unite *H. exleyae, H. flindersi* and *H. woodsi* (K). These three species unite with *H. callaspis* to form a monophyletic group by the shared synapomorphy of hind basitibial plate, in both sexes, incomplete (32). In *H. callaspis*, the synapomorphic character of the '*flindersi*' species-group (dorsal surface of the propodeum defined by carinae) was shown to be reversed, giving the species an autapomorphic character which diverges it from the three above mentioned species. These three species do not exhibit any character state that can be inferred as apomorphic and common to all three species. Since *H. callaspis* has a restricted distribution, confined mainly to the coastal south-east Queensland area (see Fig. 2a), I hypothesize that it is a peripheral isolate (Wiley, 1981) of this group of four species differentiated stochastically by the reversal of the apomorphic state of character 18. This was perhaps a response to nesting in a sandy environment. The sharp ridges of propodeal carinae may cause the fine grain sand walls of the nest tunnels to crumble while moving about inside as compared to nesting in a more compact alkaline clay soil type. The lack of a synapomorphic character for the other three species would seem to indicate that these species had diverged little from the ancestral lineage of the four species. This is an example of the phenomenon of the "Principle of Deviation" (Hennig, 1966) which states that in every sister-group pair, one group is on a whole more plesiomorphic than the other.

Subgeneric division

Blüthgen proposed the subgeneric name *Indohalictus* in 1931 although characters of the subgenus were detailed in a previous 1926 paper where he divided the genus *Halictus* into two groups, the 'Halicti striaticiptes' and 'Halicti nomioidiformes'. The latter group became the subgenus *Indohalictus*, (see Walker, 1981: 35-41, Figs. 13-16, 21-23, 25, 26 for full discussion.) In brief, the subgenus *Indohalictus* had been distinguished on the basis of the following characters: (1) frontal carina absent; (2) front of head and vertex without close parallel rugulae; (3) scutum and scutellum dull due to fine lineolation; (4) dorsal surface of propodeum with sparse

wrinkling; (5) apex of marginal cell on wing margin; (6) male genitalia with long gonostyli and large ventroapical processes on the gonocoxite.

Michener (1965: 179) synonymised *Indohalictus* with *Homalictus (Homalictus)* for "practical reasons", as it was difficult to use the subgeneric characters with certainty and for most species, only one sex was known. He (1980a) reiterated his opposition to *Indohalictus*, particularly with regards to the Australian species by stating "In future this unit (*Homalictus*) may well be divided into several subgenera, but probably not into the two proposed previously." This study had the advantage of access to numerous specimens which enabled the sexes of most species to be associated. Careful examination of all characters used for subgeneric division showed intergradation in every character with species of *Homalictus* (proper). However, no intergradation occurs between the subgenus, *Quasilictus*, described below for one species and *Homalictus* (proper).

Description of the genus *Homalictus* in Australia

Mainly small bees (<8 mm); venation of forewing complete (Fig. 4b); second r-m (third transverse cubital vein) weaker than first and second and third submarginal cell weakly defined. The first m-cu (first recurrent vein) enters the second submarginal cell or is interstitial with the first r-m (second transverse cubital vein). The second m-cu (second recurrent vein always enters the third submarginal cell and is much weaker than the first m-cu. The pterostigma is shorter than the costal margin of the marginal cell and the apex of the marginal cell in most species is separated from the wing margin.

The head of both sexes is wider than long with the eyes converging below, except in the male of H. megastigmus. The clypeus is at least twice as wide as long and usually convex. The female labrum bears a strong, single median protuberance, with relatively smooth margins.

The antennae are set below the midpoint of the face and are separated by a carina. The interantennal distance is equal to or greater than the antennocular distance. Subantennal sutures enter mediad on the lower margin of the antennal sockets. The eyes are sparsely covered with minute hair.

The anterior articulations of the mandibles are not shifted posteriorly. The malar area is absent and in side view the genal area is as wide as or narrower than the eye, except in *H. exophthalmus*.

The pronotal collar is not elevated and its dorsolateral angles usually project as spines or tubercles with a carina extending from each, to and across the pronotal tubercle.

The malus of the fore tibial strigilis of females is fan-shaped (Fig. 5c), except in *H. sphecodoides* (Fig. 5d).

In both sexes, the dorsal surface of the propodeum is not defined by carinae and gastral tergum I is impunctate, covered with a fine transverse lineolation. In females only, the gastral and femoral scopae are well developed and the fore basitarsus possesses a comb. These characters are noted in the specific descriptions only if they differ.

The BP of both sexes is short, rounded or angulate, in most species the plate is complete although in some the anterior margin is absent and rarely the entire plate is almost absent (*H. callaspis*). The TS of females bears several teeth with the largest always proximal; in males, the teeth are always minute (except *H. ctenander* and *H. brevicornutus*).

The prepygidial fimbria of females surrounds a longitudinal furrow which may appear as a straight line or a triangular area.

The pretarsal claws of females are simple, of males bifid.

Key to the Australian subgenera and species-groups of *Homalictus*

1. Hind tibia of female robust, with area of differentiated hair (short, uniform, erect, branched) on outer surface, under surface with distinct concavity (Fig. 51); Fg:UID greater than 1.0 (except *H. exophthalmus*);

gonobase of male genitalia narrow in comparison to width of gonocoxite (e.g., Figs. 13a, d, h) . . . . . *Homalictus* sensu stricto .. 2

– Hind tibia of female slender, without area of differentiated hair on outer surface, under surface scarcely concave (Fig. 5m); Fg:UID equal to or less than 1.0; gonobase of male genitalia broadly expanded to at least width of gonocoxite (Figs. 23a, b) . . . . . *Quasilictus* subgen. nov.

2. (Females only) Fore basitarsal comb absent . . . . . '*blackburni*' species-group

– (Females only) Fore basitarsal comb present 3

3. Head and propodeum black . . . . . '*spliecodoides*' species-group

– Head and propodeum otherwise 4

4. Labrum with two raised tubercles (Fig. 4i) . . '*urbanus*' species-group

– Labrum sculptured otherwise 5

5. Dorsal surface of propodeum defined by carinae (Figs. 11a-d, f-h) . . . . . '*flindersi*' species-group

– Dorsal surface of propodeum not defined by carinae (Figs. 11k,l) . . . . . '*dotatus*' species-group

Subgenus *Homalictus* Cockerell

Diagnosis. Female: hind tibiae robust, strongly concave beneath, ventral margin of anterior surface sinuate, outer surface with area of short, erect, branched hair contrasting with surrounding vestiture (Fig. 5l); gastral tergum I usually impunctate, covered with fine transverse lineolation (a few species with minute punctures medianly only), terga without tomentous bands of hair (except *H. maitlandi* in which the hair does not form a true tomentum).

Male: middle flagellar segments longer than wide; Fg:UID greater than 1.0:1; TS minutely toothed (except H. etenander pectinate); genitalia with gonobase narrower than width of gonocoxites; volsellae without large ventroapical projections; apical margin of tergum VII narrow, unilobed .

Type species. Halictus taclobanensis Cockerell, 1915b: 488.

Key to the Australian species of the subgenus *Homalictus*

Females

1. Frons, vertex, genae brown, remainder of body light red-brown; dorsal surface of propodeum smooth (Fig. 12q) . . . . . *H. rowlandi*

– Not with above colours; dorsal surface of propodeum with at least some roughening (Figs. 11a-s; 12a-p) 2

2(1). Dorsal surface of propodeum defined at least posteriorly by a raised carina (Figs. 5a-d; 5f-h) 7

– Dorsal surface not defined by carinae 3

3(2). Fore basitarsal comb absent 14

– Fore basitarsal comb present 4

4(3). Dorsal surface of propodeum relatively smooth (Figs. 11k, l); clypeus with light red-brown on at least anterior one third; BP complete . . 19
– Dorsal surface of propodeum distinctly sculptured; clypeus not coloured as above; BP complete or incomplete 5

5(4). Head and propodeum black; BP complete 20
– Head and propodeum not black; BP complete or incomplete 6

6(5). Labrum with two raised tubercles, sometimes joined anteriorly (Fig. 4i); BP complete 29
– Labrum without two raised tubercles; BP incomplete . . . *H. callaspis*

7(2). BP incomplete, defined only anteriorly 8
– BP complete 10

8(7). Frons with granulate reticulation below ocelli (Fig. 6e) . . . *H. woodsi*
– Frons with vertical striae below ocelli (Fig. 6d; 6g) 9

9(8). Scutum closely punctured along posterior margin and around posterior end of parapsidal lines (Fig. 9g); tibiae and tarsi light red-brown . . . . . *H. exleyae*
– Scutum openly punctured along posterior margin and around posterior end of parapsidal lines (Fig. 9d); tibiae and tarsi dark brown . . . . . *H. flindersi*

10(7). Scutum anteriorly with transverse wave-like plicae, directed obliquely, some meeting along midline at obtuse angle, plicae extend posteriorly to level of anterior margin of parapsidal lines (Fig. 9f) . *H. caloundrensis*
– Scutum not as above 11

11(10). Hind femora black or dark brown 12
– Hind femora with some light red-brown 13

12(11). Scutum densely punctured except anteriorly, (Fig. 10m) . . . . . *H. multicavus*
– Scutum sparsely punctured, except in parapsidal areas and in posterior lateral corners (Fig. 9a) . . . . . *H. behri*

13(11). Scutum open-sparsely punctured laterally (Fig. 9h); mid and hind femora light red-brown . . . . . *H. luteoaeneus*
– Scutum dense-closely punctured laterally (Fig. 9b); mid and hind femora dark green, except apical one third light red-brown . . . . . *H. thor*

14(3). Sculpture on dorsal surface of propodeum minutely anastomosed (Fig. 12d); scutum dark green, sometimes tinged with gold or red . . . . . *H. dampieri*
– Sculpture on dorsal surface of propodeum areolate to rugose (Figs. 12b-e; 12e-f); scutum black 15

15(14). Length greater than 5.5 mm 16
– Length less than 5.5 mm 17

16(15). Short, golden, adpressed hair across gastral terga II and III . . . . . *H. maitlandi*
– Without such gastral pubescence . . . . . *H. blackburni*

17(15). Legs black or dark brown . . . . . *H. atrus*
– Legs with light red-brown colour 18

18(17). Coxae, trochanters, basal two thirds of femora dark brown, remainder light red-brown . . . . . *H. cassiaefloris*
– Fore and hind coxae dark brown, mid coxae and remainder of legs light red-brown . . . . . *H. eurhodopus*

19(4). Scutum open-sparsely punctured (Fig. 9l); scutum shining . *H. dotatus*
– Scutum closely punctured (Fig. 9k); scutum with a dull lustre . . . . . *H. sphecodopsis*

20(5). Dorsolateral angles of pronotum projecting as erect lamellae; scutum metallic purple . . . . . *H. ctenander*
– Dorsolateral angles not projecting as erect lamellae; scutum otherwise 21

21(20). Frons coarsely reticulate (Fig. 7a-b) 22
– Frons smooth or with vertical striae (Figs. 7c-g; 7i) 23

22(21). Malus of strigilis comb-shaped (Fig. 4d) . . . . . *H. sphecodoides*
– Malus of strigilis fan-shaped (Fig. 4c) . . . . . *H. houstoni*

23(21). Scutum with most punctures elevated above surrounding surface (volcano like, Fig. 9j) . . . . . *H. brisbanensis*
– Scutal punctures not elevated above surrounding surface 24

24(23). Scutum punctured and with transverse shallow furrows (Fig. 9r) . . . . . *H. punctatus*
– Scutum punctured, but not furrowed 25

25(24). Scutum closely punctured anteromesially and in parapsidal areas (Fig. 9i) . . . . . *H. tatei*
– Scutum sparsely punctured (Figs. 9o-q; 10e) 26

26(25). Frons with strong vertical striae across entire surface (Fig. 7c) . . . . . *H. scrupulosus*
– Frons with or without vertical striae, if present, striae weak and medianly only (Figs. 7d-e; 7g) 27

27(26). Clypeal width equal to or greater than three times the length; scutum tessellate, punctures clearly visible . . . . . *H. megastigmus*
– Clypeal width less than three times the length; scutum reticulate, punctures indistinct 28

28(27). Dorsolateral angle of pronotum (viewed from above) projecting as a small acute spine; dorsal rim of propodeum shining . . . *H. pectinalus*
– Dorsolateral angle of pronotum (viewed from above) projecting slightly as a small rounded tubercle; dorsal rim of propodeum dull . . . . . *H. niveifrons*

29(6). Frons granulate or reticulate, no distinct vertical striae (Figs. 8c-d) . 30
– Frons with distinct vertical striae (Figs. 8e-i) 31

30(29). Frons weakly reticulate; eyes bulbous (in side view EW:GW c. 2.6:1 Fig. 5l); gastral tergum without minute punctures . . . . *H. exophthalmus*

– Frons coarsely reticulate; eyes not bulbous in side view (EW:GW c. 1.5); gastral tergum I mesially with transverse rows of minute punctures . . . . . *H. urbanus*

31(29). Gastral tergum I with minute punctures mesially; posterior vertical surface of propodeum sparsely covered with short, minutely branched hair . . . . . *H. murrayi*

– Gastral tergum I impunctate; vertical posterior surface of propodeum densely covered with long, plumose hair 32

32(31). Scutum mesad of parapsidal lines openly punctured (Fig. 10o) . . . . . *H. holochlorus*

– Scutum mesad of parapsidal lines closely punctured either entirely or mesially only (Figs. 10k-l) 33

33(32). Scutum closely punctured (on basal two thirds) along midline and parapsidal areas only (Fig. 10l); scutum usually blue; coastal Queensland . . . . . *H. stradbrokensis*

– Scutum closely punctured on basal two thirds (Fig. 10k); scutum usually green; south-west Western Australia . . . . . *H. bremerensis*

Males

1. Dorsolateral angles of pronotum projecting as erect lamellae; scutum metallic purple . . . . . *H. ctenander*

– Dorsolateral angles of pronotum not projecting as erect lamellae; scutum otherwise 2

2(1). Dorsal surface of propodeum defined either posteriorly or laterally by a carina (marked with areolate rugae forming a cell-like matrix) . . . 6

– Dorsal surface of propodeum not defined by carinae, marked with rugae or rugulae not forming the above pattern 3

3(2). BP incomplete . . . . . *H. callaspis*

– BP complete 4

4(3). Clypeus with some pale yellow or dull white markings 10

– Clypeus with no pale yellow or dull white markings 5

5(4). Fg:UID greater than 2.0:1 17

– Fg:UID less than 2.0:1 22

6(2). BP complete; gastral sternum VI with a median oval tuft of erect hair (Fig. 24a) . . . . . *H. behri*

– BP incomplete; gastral sternum VI with or without tufts of erect hair 7

7(6). Gastral sternum VI with distinct raised tufts of erect hair (Figs 24b-c) 8

– Gastral sternum VI without tufts of erect hair (Figs 24e-f) 9

8(7). Gastral sternum VI with a small median and large lateral tufts of erect hair (Fig. 24b) . . . . . *H. woodsi*

– Gastral sternum VI with a large median and small lateral tufts of hair (Fig. 24c) . . . . . *H. caloundrensis*

9(7). Femora and tibiae black to dark brown . . . . . *H. flindersi*
– Femora apically and tibiae light red-brown . . . . . *H. exleyae*

10(4). Frons, paraocular areas and supraclypeal area completely covered with short, adpressed hair; antennal flagellum light red-brown; genae with short, branched hair 11
– Frons, paraocular areas and supraclypeal area with or without short, adpressed hair, if present never a complete cover; antennal flagellum black; genae with long, branched hair (sometimes forming a beard) 13

11(10). Scutum closely punctured, dull . . . . . *H. sphecodopsis*
– Scutum openly punctured, shining 12

12(11). Genitalia with apical processes of gonocoxites small and narrow (Fig. 15d-f); Australia except Tasmania (Fig. 3b) . . . . . *H. dotatus*
– Genitalia with apical processes of gonocoxites large and broad (Figs 15g-i); southern Queensland only (Fig. 3b) . . . . . *H. imitatus*

13(10). Frons and scutum green, sometimes tinged with gold . . . *H. dampieri*
– Frons and scutum black 14

14(13). Fore tarsal segments flanged laterally (Fig. 5j) and with long, branched hair 15
– Fore tarsal segments not flanged laterally and with short, simple hair 16

15(14). All tarsi flanged laterally; pronotal tubercle cream-yellow . . . . . *H. grossopedalus*
– Only fore tarsi with segments flanged laterally; pronotal tubercle brown . . . . . *H. latitarsis*

16(14). Trochanters and femora light red-brown . . . . . *H. eurhodopus*
– Trochanters and femora black . . . . . *H. blackburni*

17(5). Fore trochanters covered with long, plumose hair arising from the posterior surface; UID:LID greater than 1.5:1 . . . . . *H. cassiaefloris*
– Fore trochanters not covered with long, plumose hair; UID:LID less than 1.5:1 18

18(17). Head densely covered with short, plumose hair 19
– Head sparsely covered with short, branched hair . . . . . *H. tatei*

19(18). UID:LID about 1.1:1 . . . . . *H. megastigmus*
– UID:LID greater than 1.3:1 20

20(19). Pronotal tubercle and scape basally light red-brown . . . . *H. houstoni*
– Pronotal tubercle and scape black 21

21(20). Gaster black . . . . . *H. sphecodoides*
– Gaster with at least terga II and III light red-brown . . . *H. punctatus*

22(5). Frons with vertical striae . . . . . *H. scrupulosus*
– Frons reticulate 23

23(22). Head and scutum black . . . . . *H. niveifrons*
– Head and scutum green or blue 24

24(23). EW:GW at least 3:1 . . . . . *H. exophthalmus*
– EW:GW not exceeding 2.5:1 25

25(24). Gastral tergum I impunctate 26
– Gastral tergum I with punctures mesially 28

26(25). Scutum densely punctured in parapsidal areas . . . . . *H. multicavus*
– Scutum sparsely punctured in parapsidal areas 27

27(26). Scutum coppery tinged with red; genitalia, in ventral view, with apical processes of gonocoxites broad (Fig. 22a); Queensland . . . . . *H. stradbrokensis*
– Scutum dark green; genitalia, in ventral view, with apical processes of gonocoxites narrow (Fig. 21g); south west Western Australia . . . . . *H. bremerensis*

28(25). Scutum closely punctured in parapsidal areas and along posterior margin 29
– Scutum sparsely punctured mesially and posteriorly . . . . *H. urbanus*

29(28). Scutellum closely punctured; dorsal surface of propodeum about half length of scutellum . . . . . *H. forrestae*
– Scutellum sparsely punctured; dorsal surface of propodeum about same length as scutellum . . . . . *H. murrayi*

Species-groups

'*blackburni*' species-group

Species included: H. atrus; H. blackburni; H. cassiaefloris; H. dampieri; H. eurhodopus; H. grossopedalus; H. latitarsis; H. maitlandi.

Distinguished by the following characters: Females–fore basitarsal comb absent; scutum black (except *H. dampieri*, dark olive green). Males–body sculpture microtessellate. Both sexes- apex of marginal cell terminates on wing margin (except *H. dampieri* male).

Females. Average BL (two groups) c. 6.2 mm, 5.0 mm; width of clypeus less than three times the length (except *H. dampieri*, three times length), slope continues the contours of frons; labrum (Fig. 4h) with lateral margins of basal area flanged, not bordering a recessed area, median tubercle recessed, rounded apically, defined by carina; fore basitarsal comb absent; dorsal surface of propodeum (Figs. 12b-i), with rugae and rugulae, branched and areolate; TS slender with at least three teeth. Males. average BL (two groups) c. 5.6 mm, 4.6 mm; gaster appears long and distally tapered; dorsal surface of propodeum as in female; genitalia (Figs. 18d-i; 19a-f; 20a-f) characterised by large, ventroapical processes on the gonocoxites, long gonostyli, large volsellae.

Distribution. Mainly northern Australia; one species, *H. dampieri* extends to northern New South Wales (Fig. 3b).

'*dotatus*' species-group

Species included: H. dotatus; H. imitatus; H. sphecodopsis.

The gaster of both sexes is lightly pigmented and semi-translucent. Internal nectar air bubbles or gut contents often appear as dark areas on the tergites and have been confused as dark pigmentation. Cockerell (1910, 1929b) described a new species and subspecies mainly on the basis of a 'darker abdomen'.

The wing venation of both sexes provides a reliable character. The first recurrent vein (1st m-cu) enters the 2nd submarginal cell before the 2nd cubital vein (1st r-m) and the basal vein is obtusely bent at the junction point.

Females. Average BL c. 5.2 mm; width of the clypeus at least three times the length, slope continues contours of frons; labrum (Fig. 4f)

with lateral margins of basal area flanged upwards bordering a recessed area, median tubercle raised, apically rounded, defined by a carina; dorsal surface of propodeum (Figs. 11i-l) with rugulae and few interconnectives; TS slender with two or three blunt teeth. Males. average BL c. 4.3 mm; gaster appears long and distally tapered; dorsal surface of propodeum as in female; genitalia (Figs. 15a-i) characterised by large protruding volsellae and apical projections on gonocoxites.

Distribution. Throughout Australia, absent from Tasmania; *H. dotatus* present in large numbers in the drier regions of inland Australia and constitutes the bulk of the *Homalictus* fauna in these areas; other species appear restricted to coastal regions of eastern Australia within the 600-800 mm average rainfall isohyet (Fig. 2b).

'*flindersi*' species-group

Species included: H. beltri; H. callaspis; H. caloundrensis; H. exleyae; H. flindersi; H. luteoaeneus; H. thor; H. woodsi.

Females. Average BL c. 6.8 mm; width of clypeus less than three times the length, slope of clypeus at obtuse angle to frons and protruding beyond lower margins of the eyes; basal section of labrum (Fig. 4e) with upturned flange on proximal lateral areas, median area raised, sloping gently to frontal rim, not bounded by lateral carinae; dorsal surface of propodeum (Figs. 11a-d; 11f-h), with areolate rugae, defined laterally and posteriorly by prominent carinae except *H. callaspis* (no carinae, Fig. 11e); TS with two or three, large teeth. Males. average BL c. 5.7 mm, relatively uniform in colour, either dark green or blue; dorsal surface of propodeum as in female; genitalia (Figs. 13d-k; 14a- l) characterised by large 'arm-like' processes (arrowed in Fig. 13d) originating on each gonocoxite which protrude and converge ventrally, distinctive vestiture on 'arm' processes (except *H. beltri*, Figs. 13a-c).

Distribution. Mainly coastal within the 600 mm average annual rainfall isohyet; typical Torresian faunal distribution (except *H. caloundrensis* extends south to north-west Victoria and south-eastern South Australia) (Fig. 2a).

'*sphecodoides*' species-group

Species included: H. brisbanensis; H. ctenander; H. houstoni; H. megastigmus; H. niveifrons; H. pectinalus; H. punctatus; H. scrupulosus; H. sphecodoides; H. tatei.

No single character will differentiate this species-group, colour may be used for both sexes as an artificial character: Female–head and propodeum black, scutum dark green or blue (except H. ctenander, iridescent purple). Male–head, scutum and propodeum black, (except *H. ctenander*, iridescent purple), head with short, adpressed hair.

Females. Average BL c. 5.2 mm; width of clypeus variable from less than three times length to greater than three times length; slope of clypeus continues contours of frons; labrum (Fig. 4g) with lateral margins of basal area flanged upwards, not bordering recessed area, median tubercle elevated, apically pointed, defined by carina; dorsal surface of propodeum (Figs. 11m-s; 12a) with rugae and interconnectives; TS well developed with at least four small blunt teeth. Males. average BL c. 4.6 mm; dorsal surface of propodeum as in female; genitalia (Figs. 16a-i; 17a-i; 18a-e) characterised by gonocoxal processes arising apically from the gonocoxite; TS minutely toothed except *H. ctenander* pectinate.

Distribution. Typical Bassian faunal distribution, a few species extend to north Queensland (Fig. 2b, 3a).

'*urbanus*' species-group

Species included: H. bremerensis; H. exophthalmus; H. forrestae; H. holochlorus; H. multicavus; H. murrayi; H. stradbrokensis; H. urbanus.

Distinctive characters of the species-group are as follows: Females– labrum with two raised tubercles. Males–gastral sternum VI coarsely granulate, covered with many small inverted 'v' shape protrusions.

Females. Average BL c. 5.4 mm; width of clypeus greater than twice length but less than three times; slope of clypeus continues the contours of the frons, except in H. exophthalmus convex; labrum (Fig. 4i) as above, in addition, lateral margins of basal area are flanged and

surround a recessed area; dorsal surface of propodeum (Figs. 12j-p) (*H. multicavus* defined posteriorly), with areolate or branched rugae/rugulae; TS with two or three large blunt teeth and shorter than outer spur. Males. average BL c. 4.3 mm; dorsal surface of propodeum as in female; genitalia (Figs. 19g-i; 21a-i; 22a-i) characterised by ventral processes arising from the volsellae; gastral sternum VI as above.

Distribution. Australia, excluding Tasmania; *H. urbanus* occurs throughout Australia (mainland), other species appear restricted within definite boundaries (Fig. 4a).

AUSTRALIAN SPECIES

Homalictus atrus sp. nov.

Figures 3b; 8b; 10h; 12i

Material examined.

Holotype ♀, Paratypes 2 ♀♀, 15°47'S., 145°17'E., Moses Ck, 4 km NE Mt Finnigan, Queensland, 14-16 Oct 1980, J.C. Cardale (ANIC).

Other specimens examined: (1 ♀) (PD: 4,10) (FR: Not recorded) QUEENSLAND: Lockerbie (ANIC).

Diagnosis. A member of the '*blackburni*' species-group, most like *H. blackburni*; distinguished from other members of the genus by the following combination of characters: fore basitarsal comb absent; length <5.5 mm; sculpturing on dorsal surface of propodeum areolate and extends to dorsal rim (Fig. 12i).

Female. BL 4.7-4.9 mm (holotype c. 4.9 mm); FL 3.5-3.7 mm (holotype c. 3.7 mm); head wider than long (57:47); UID:LID as 31:30; clypeus slightly convex, width less than three times length (26:10); antennal sockets separated by distance less than diameter of socket; supraclypeal area slightly raised. AOD:IAD:OAD:IOD:OOD as 11:4:21:8:8. Scape extending to level of anterior margin of median ocellus; dorsolateral angle of pronotum projecting as acute spine; fore basitarsal comb absent; BP complete, bluntly angulate apically; TS with four blunt teeth, decreasing in size with last tooth minute and slightly shorter than outer spur.

Sculpturing. Head smooth (Fig. 8b), frons, clypeus and supraclypeal area reticulate, frons and supraclypeal area impunctate, clypeus with minute sparse hair pits; scutum (Fig. 10h) and scutellum microtessellate, impunctate; dorsal surface of propodeum (Fig. 12i) with branched rugae extending laterally and mesially to rim.

Colour. Head, mesosoma, gaster black; antennal flagellum, pronotal tubercle, fore and mid legs (except coxae, black) dark brown.

Pubescence. Sparse; head and mesosoma almost bare, a few short, erect, simple hairs on frons, vertex, scutum and scutellum; lower paraocular areas, genae, basal two thirds of mandibles and posterior margin of scutellum with short, minutely branched hair; clypeus with a few long, simple hairs along anterior margin; vertical surface of propodeum with long, branched hair; gastral terga III, IV, V with a few short, backwardly inclined, simple hairs.

Remarks. Male unknown. The specific name refers to the colour of the species.

Distribution. North Queensland (Fig. 3b).

Homalictus behri (Cockerell)

Figures 2a; 6b; 9a; 11b; 13a-c; 24a

Halictus behri Cockerell, 1910: 228.–1929b: 2 (Cockerell's suggested synonymy of *H. behri* with *H. woodsi* is not recognised.).–1933: 305.

Homalictus behri.–Michener, 1965: 179.

Material examined.

Holotype ♀, Port Darwin, Nov 1902, Turner Coll. 1910-7 (BMNH)

Other specimens examined: (42 ♀♀, 11 ♂♂) (PD: 1,2,5,10,11) (FR: *Parinari, Dysophylla, Eucalyptus, Thryptomene, Tristanopsis, Borreria*) QUEENSLAND: 1♀ (*H. flindersi* var. a) Mackay, Mar. 1892, 400, Turner Coll., 1910-7 (BMNH), 1♀ (*H. flindersi* var. a) Mackay, Mar. 1900, 400, Turner Coll., 1910-7 (BMNH); Bamaga, Gregory Downs, Townsville, Samford (UQIC); Giru, Mt Webb, Hope Vale Mission (ANIC); Cairns (NMV); Mackay (BMNH). NORTHERN TERRITORY: Cobourg Peninsula, Mt Cahill, Borroloola, Cape Crawford, Victoria River Downs HS, Oenpelli (ANIC); Darwin (SAM, ANIC) WESTERN AUSTRALIA: Mitchell Plateau (ANIC).

Diagnosis. A member of the '*flindersi*' species-group, most like *H. thor*; distinguished from other members of the genus by the following combination of characters: Female–dorsal surface of propodeum defined by carinae; BP complete; vertical striae below ocelli; scutum

(Fig. 9a) with weak transverse plicae anteriorly, openly punctured in parapsidal areas, dense-openly in posterior lateral corners, remainder sparsely punctured. Male–BP complete; gastral sternum VI with median oval tuft of erect hair (Fig. 24a); penis valves of genitalia with longitudinal furrows (Figs. 13a,b).

Female. BL 6.6-7.6 mm (holotype c. 6.7 mm); FL 4.8-5.5 mm (holotype c. 5.0 mm); head wider than long (75:68); UID:LID as 39:35; clypeus less than twice as wide as long (33:18), convex, protruded; antennal sockets separated by distance less than diameter of sockets. AOD:IAD:OAD:IOD:OOD as 13:6:26:11:9. Scape reaching anterior margin of median ocellus; dorsolateral angle of pronotum projecting as a small, blunt spine; dorsal surface of propodeum as long as scutellum, defined by carinae; TS with three blunt teeth and shorter than outer spur; BP complete and rounded.

Sculpturing. Head roughened, frons (Fig. 6b) beneath ocelli with granulated reticulation, weak vertical striae in paraocular areas opposite antennal sockets, on upper frons continuing around eye, and weak transverse striae in front of ocelli; clypeus finely reticulate, openly punctured; scutum (Fig. 9a) with weak transverse plicae anteriorly, openly punctured in parapsidal areas, dense-openly in posterior lateral corners, remainder sparsely punctured; scutellum smooth mesially, finely reticulate, openly punctured; dorsal surface of propodeum (Fig. 11b) with areolate rugae extending to rim; gastral tergum I with minute hair pits.

Colour. Frons, vertex, genae and propodeum dark blue; anterior two thirds of clypeus royal blue, remainder black; scape with light red-brown variable from basal ring to at least half, remainder dark brown; flagellum light brown; scutum and scutellum blue suffused with green; coxae, trochanters, femora, mid and hind tibiae and basal two thirds of basitarsi dark brown to black, inner surface of fore tibiae, and distal section of tarsi light red-brown; gaster steel blue.

Pubescence. Frons, vertex, paraocular areas and supraclypeal area sparsely covered with short, erect, minutely branched hair; clypeus with a few short, forwardly inclined, simple hairs; genae with sparse, long, erect, branched hair; scutum covered with short, minutely branched hair; scutellum with a few long, branched hairs; propodeum dorsally bare, vertical surface with erect, long, branched hair; gastral terga I and II almost bare, lateral margins of terga II and terga III, IV and V with increasing density of short, simple hair.

Male. BL 5.4-5.8 mm; FL 3.9-4.4 mm; head wider than long (60:54); eyes converging strongly below, UID:LID as 35:26; scape not reaching level of median ocellus; Fg:UID as 2.0:1. AOD:IAD:OAD:IOD:OOD as 9:6:19:11:8. BP complete, apically rounded.

Sculpturing. Head roughened, frons with crescent shape transverse striae originating at level of antennal bases, a few transverse striae below ocelli continuing behind eye, transverse striae on vertex; clypeus and supraclypeal area reticulate, openly punctured; scutum anteriorly dull, reticulate, impunctate with several transverse plicae, closely punctured in parapsidal areas and hind margin, medianly shining and sparsely punctured; scutellum shining sparsely punctured; dorsal surface of propodeum, defined by carinae, with areolate rugae extending to rim.

Colour. Frons, vertex, genae and propodeum dark blue; clypeus, supraclypeal area, scutum and scutellum black tinged with dark green; coxae, trochanters and femora dark green-black, mid and hind tibiae dark brown, fore tibiae and all tarsi light red-brown; gaster steel blue, tergum VII black.

Pubescence. Frons, vertex, genae, sides of mesosoma and metanotum with erect, plumose hair; gastral sterna III and IV with transverse row of long golden hair along posterior margin.

Genitalia. Figs. 13a, b, c.
Gastral Sternum VI. Fig. 24a.

Remarks. Specimens of this species were misidentified by Cockerell (1905c, 1910) as *Halictus flindersi* var. a.

Distribution. Northern Australia (Fig. 2a).

Homalictus blackburni (Cockerell)

Figures 3b; 7h; 10b; 12b; 18d-f; 26c

Halictus blackburni Cockerell, 1910: 232.–1933: 305.
Halictus crinitus Friese, 1924: 243. (syn. by Cockerell, 1929a: 12.–1933: 305.)
Homalictus blackburni.–Michener, 1965: 179.
H. crinitus.–Michener, 1965: 180.

Material examined.

Holotype ♀ of *Halictus blackburni*, Mackay, Queensland, May 1899, R.E. Turner, 915, on *Xanthorrhoea* sp. (BMNH).

Lectotype ♂ of *Halictus crinitus*, Mackay, Queensland, Sept. 1899, R.E. Turner, on *Leptospermum* sp. (AMNH). Lectotype designated by Pauly (in press).

Other specimens examined: (175 ♀♀, 64 ♂♂) (PD: 1-5,7-11) (FR: *Eucalyptus, Eugenia, Melaleuca, Thryptomene, Tristanopsis, Xanthorrhoea*) QUEENSLAND: Mackay (BMNH, UQIC, NMV); Townsville (SAM); Beecher, Seaforth, Babinda, Cooktown, Silver Plains Hmsd, Iron Range (UQIC); Mt Webb Nat. Pk (ANIC); Mt Molloy (DPI); Cairns (DPI, UQIC); Gordonvale (BPBM); Moa Is. (UQIC, DPI, SAM). NORTHERN TERRITORY: Katherine, Jabaluka Lagoon, Mt Cahill, Oenpelli (ANIC); Wildman R. (DPI); Mataranka, Coomalie Ck (UQIC); Darwin (UQIC, ANIC); Melville Is. (SAM).

Diagnosis. A member of the '*blackburni*' species-group, most like *H. latitarsis*; distinguished from other members of the genus by the following combination of characters: Female–fore basitarsal comb absent; sculpturing on dorsal surface of propodeum areolate, extending at least half length to rim (not reaching rim) (Fig. 12b); lack of hair bands across gastral terga II and III. Male–BP complete; clypeus with some dull white markings; genae with long, branched hair (almost forming a beard); frons and scutum black; fore tarsal segments not flanged; trochanters and femora black.

Female. BL 5.5-6.2 mm (holotype c. 6.2 mm); FL 3.9-4.5 mm (holotype c. 4.6 mm); head wider than long (70:60); UID:LID as 37:36; clypeus convex, width less than three times length (32:13); antennal sockets separated by distance greater than diameter of socket; supraclypeal area bulbous. AOD:IAD:OAD:IOD:OOD as 10:8:22:10:8. Scape reaching anterior margin of median ocellus; dorsolateral angle of pronotum projecting as small acute tubercle; fore basitarsal comb absent; BP complete, apically rounded; TS with five pointed teeth and slightly smaller than outer spur.

Sculpturing. Head smooth, frons (Fig. 7h), vertex, clypeus and supraclypeal area finely reticulate; clypeus punctured, densely punctured along anterior margin, remainder openly punctured; scutum (Fig. 10b) and scutellum finely reticulate, punctured with small shallow open punctures (scutum) and sparse punctures (scutellum); dorsal surface of propodeum (Fig. 12b) microtessellate, basally with areolate rugae extending at least half length but not reaching rim, laterally a few short rugae.

Colour. Head, mesosoma, propodeum and gaster black; antennal scapes red- brown at basal rim, flagellum brown beneath; tarsi red-brown.

Pubescence. Frons with short, erect, simple hair; vertex, genae, clypeus with branched hair; frons laterally, lower paraocular areas and supraclypeal area with short, plumose, inclined hair; clypeus with a few long, simple hairs along anterior margin; scutum with short, erect, minutely branched hair; scutellum and metanotum with long, branched hair; propodeum bare dorsally, upper vertical lateral surface with row of erect, plumose hair, remainder with long, branched hair; gastral terga I, II almost bare, terga III, IV and V with increasing density of hair.

Male. BL 5.0-5.9 mm; FL 3.6-4.2 mm; head wider than long (60:52); eyes converging strongly below, UID:LID as 34:23; scape not reaching level of median ocellus; Fg:UID as 1.9:1. AOD:IAD:OAD:IOD:OOD as 6:6:19:10:9. BP complete, apically rounded.

Sculpturing. Head smooth, finely reticulate; clypeus with a few shallow punctures; scutum and scutellum finely reticulate, minutely sparsely punctured; dorsal surface of propodeum with areolate rugae medianly extending at least half way to rim, laterally smooth.

Colour. Head black, except clypeus pale yellow with posterior lateral areas black; mesosoma, and gaster black; coxae, trochanters, femora black, basal and apical areas of tibiae red-brown, remainder of tibiae black, tarsi light red-brown.

Pubescence. Frons with short, erect, simple hair; vertex and clypeus with erect, branched hair; frons laterally and supraclypeal area with erect, plumose hair, lower paraocular areas with short, plumose, adpressed hair; genae with long, branched hair (almost forming a beard); scutum with short, erect, simple hair; scutellum along posterior margin and metanotum with a few long, branched hairs; upper vertical lateral surface of propodeum with erect, branched hair; gastral sterna with increasing density of hair, sterna III, IV with sparse complete cover.

Genitalia. Figs. 18d, e, f.

Gastral Sternum VI Fig. 26c.

Remarks. In spite of its wide distribution, there is little variation in this species.

Distribution. Northern Queensland and Northern Territory (Fig. 3b).

Homalictus bremerensis (Rayment)

Figures 4a; 8e; 10k; 12l; 21g-i; 27c

Halictus formosus Rayment, 1930a: 52 (not Dours, 1872: 300).–Cockerell, 1933: 311, syn. nov.

Halictus bremerensis Rayment, 1931a: 171.–Cockerell, 1933: 306.

Homalictus formosulus Michener, 1965: 180, syn. nov.

Homalictus bremerensis.–Michener, 1965: 179.

Material examined.

Holotype ♀ of *Halictus formosus*, Albany, 23 Oct 1929, T. Greaves (ANIC) (Rayment's (1930) species *Halictus formosus* is a junior primary homonym of *Halictus formosus* Dours and is therefore preoccupied; Michener (1965) proposed the specific name *formosulus* when making a new combination of Rayment's (1930) species.)

Holotype ♀ of *Halictus bremerensis*, Bremer Bay, Jan 1916, L. Glauert (WAM).

Other specimens examined: (26 ♀♀, 1 ♂) (PD: 1,10,12) (FR: *Callistemon, Eucalyptus*) WESTERN AUSTRALIA: Walpole, Donnelly R. Crossing on Pemberton/Nannup Rd, Margaret R. on Yallingup Rd, Yallingup, Alexandra Bridge Brockman Hwy (UQIC): Cowaramup, Midland (WAM); Karri Forest, Pemberton (BPBM); Nornalup (SAM).

Diagnosis. A member of the '*urbanus*' species-group, most like *H. stradbrokensis*; distinguished from other members of the genus by the following combination of characters: Female–labrum with two raised tubercles; frons with vertical striae; gastral tergum impunctate; scutum closely punctured on basal two thirds (Fig. 10k). Male–BP complete; Fg:UID < 2.0:1; EW:GW < 2.5:1; frons reticulate; gastral tergum impunctate; scutum sparsely punctured in parapsidal areas; genitalia, in ventral view, with apical gonocoxal processes narrow (Fig. 21g).

Female. BL 5.2-6.5 mm (holotype c. 5.2 mm); FL 3.8-4.6 mm (holotype c. 3.8 mm); head wider than long (69:55); eyes converging below, UID:LID as 30:28; clypeus slightly convex, width less than three times length (30:12); antennal sockets separated by distance less than diameter of socket. AOD:IAD:OAD:IOD:OOD as 15:5:22:11:11. Scape extending to level of anterior margin of median ocellus; EW:GW as 1.4:1; dorsolateral angle of pronotum projecting as small acute spine; TS with two large blunt teeth and one minute distal tooth and half length of outer spur.

Sculpturing. Head roughened (Fig. 8e), frons with vertical striae to level of anterior margin of rear ocelli; vertex with transverse striae extending onto genae; supraclypeal area and basal half of clypeus reticulate, sparsely punctured with small hair pits, anterior half of clypeus smooth and polished, large punctures along anterior margin; scutum (Fig. 10k) reticulate and dull, anterior one third impunctate, remainder closely punctured, except densely punctured along hind margin; scutellum finely reticulate, anteriorly closely punctured, remainder openly punctured; dorsal surface of propodeum (Fig. 12l) with areolate rugae extending mesially to rim, laterally onto vertical surface.

Colour. Frons, paraocular areas, supraclypeal area and basal half of clypeus dark olive green, anterior half of clypeus black; scape black, flagellum dark brown above, light brown beneath; scutum dark green tinged with gold; scutellum blue-green; propodeum dark blue; coxae, trochanters and femora dark brown-black, tibiae and tarsi dark brown suffused with light red-brown patches; gastral terga black with anterior margins dark brown.

Pubescence. Head sparsely covered with erect, minutely branched hair, a few long, simple hairs along anterior margin of clypeus; scutum and scutellum sparsely covered with

both short, backwardly inclined, simple and short, erect, minutely branched hair, a few long, erect, branched hairs on lateral and posterior margins of scutellum; propodeum bare dorsally, posterovertically densely covered with long, erect, plumose hair; gastral terga I and II almost bare except lateral margins and remaining terga with increasing density of short and long, simple, apicad directed hair.

Male. BL c. 3.9 mm; FL c. 3.0 mm; head wider than long (46:41); eyes converging below, UID:LID as 29:20; scape almost reaching level of anterior margin of median ocellus; Fg:UID as 1.9:1; EW:GW as 1.8:1. AOD:IAD:OAD:IOD:OOD as 8:5:16:9:7. BP complete, apically rounded; TS two thirds length of outer spur.

Sculpturing. Frons finely reticulate; clypeus and supraclypeal area smooth and shining (though weakly reticulate), sparsely punctured; scutum and scutellum (shining) finely reticulate, sparsely punctured with minute hair pits; dorsal surface of propodeum with areolate rugae reaching rim.

Colour. Head, scutum and scutellum dark green; propodeum dark green tinged with blue; coxae, trochanters dark brown, remainder of legs brown, except fore tibiae and tarsi light brown; gaster dark brown.

Pubescence. Frons and vertex sparsely covered with short, erect, minutely branched hair; lower paraocular areas, clypeus and genae with short, inclined, branched; scutum and scutellum with both long, erect, minutely branched and short, simple, backwardly directed hair; metanotum and propodeum posterovertically with a few long, erect, branched hairs; gastral terga almost bare, a few short, simple, inclined hairs on terga III to VI.

Genitalia. Figs. 21g, h, i.

Gastral Sternum VI. Fig. 27c.

Remarks. The colour of the female described is the 'usual' form; however, the colour may vary to green-blue or coppery tinged with red.

Distribution. South-west Western Australia (Fig. 4a).

Homalictus brisbanensis (Cockerell)

Figures 2b; 6j; 9j; 11j

Halictus brisbanensis Cockerell, 1918: 117.–1933: 306.
Halictus botanicus Rayment, 1935: 696. syn. nov.
Halictus portlandicus Rayment, 1953: 24, fig. 5. syn. nov.
Homalictus brisbanensis.–Michener, 1965: 179.
Homalictus botanicus.–Michener, 1965: 179.
Homalictus portlandicus.–Michener, 1965: 181.

Material examined.

Holotype ♀ of *Halictus brisbanensis*, Brisbane, Queensland, 17 Sep 1914, H. Hacker (USNM).

Holotype ♀ of *Halictus botanicus*, Botanic Gardens, 20 Feb 1932, Melbourne, Victoria, M.F. Alleyne (ANIC). (Type incorrectly referred to as male in original description.)

Holotype ♀ of *Halictus portlandicus*, Portland, Victoria, 26 Sep 1952, T. Rayment, on *Cryptostemma calendulaceum* (ANIC).

Other specimens examined: (53 ♀♀) (PD: 1-3,5,9-12) (FR: *Artopheca, Amyema, Callistemon, Eucalyptus, Leptospermum, Syncarpia, Tristanopsis, Oenothera*) QUEENSLAND: Mareeba, Herberton (QDPI); Pomona, Biggenden, Kenilworth, Ormiston, Palen Ck, Bunya Mts, Toowoomba, Stanthorpe, Beerwah, Bribie Is. (UQIC); Brisbane (UQIC, QM); Caboolture, Springbrook, Fernvale (SAM). NEW SOUTH WALES: Coffs Harbour, Sydney, Salisbury (UQIC). VICTORIA: Healesville, Woori Yallock (UQIC); Melbourne (UQIC, NMV); Anglesea, Cape Schank (NMV).

Diagnosis. A member of the *'sphecodoides'* species-group; females distinguished from other members of the genus by the following unique character: rim of scutal punctures elevated above surrounding surface.

Female. BL 4.6-5.7 mm (holotype c. 5.0 mm); FL 4.0-4.4 mm (holotype c. 4.2 mm); head wider than long (62:51); UID:LID as 35:36; clypeal width at least three times length (30:9); antennal sockets separated by distance equal to diameter of socket. AOD:IAD:OAD:IOD:OOD as 13:5:19:9:9. Scape reaching posterior margin of median ocellus; TS with four small, blunt teeth and same length as outer spur; BP complete and apically rounded.

Sculpturing. Head relatively smooth, frons finely reticulate laterally, mesially with weak vertical striae (Fig. 6j) extending from above antennal bases to below level of median ocellus; paraocular areas, clypeus and supraclypeal area finely reticulate with sparse punctures on

clypeus; scutum (Fig. 9j) granulate due to coarse reticulation and wide shallow open-sparse punctures with rim of puncture elevated above surrounding surface; scutellum openly punctured; propodeum finely reticulate, dorsal surface (Fig. 11j) with rugae extending laterally to rim and mesially areolate on anterior half only.

Colour. Frons, clypeus, supraclypeal area, scutellum and propodeum black; basal half of scape red-brown, remainder of scape and flagellum brown, scutum blue-green suffused with dull yellow; apical one third of femora, fore and mid tibiae and tarsi and hind tarsi red-brown, remainder of femora, trochanters and hind tibiae dark brown, coxae black; gaster red-brown suffused with dark pigmentation.

Pubescence. Head sparsely covered with short semi-erect, simple hair; scutum sparsely covered with short, backwardly directed hair, a few long, erect, branched hairs on scutellum; metanotum with short, plumose hair mediad.

Remarks. Male unknown. Colour variations in the degree of darkening of the mid and hind legs and an almost entirely brown scape were noted.

Distribution. North Queensland to Victoria; mainly coastal (Fig. 2b).

Homalictus callaspis (Cockerell)

Figures 2a; 6e; 9e; 11e; 14a-d; 24d

Halictus callaspis Cockerell, 1915a: 6.–1933: 306.
Homalictus callaspis.–Michener, 1965: 179.

Material examined.

Holotype ♀, Bribie Is., 2 Nov 1913, H. Hacker (QM).

Other specimens examined: (93 ♀♀, 12 ♂♂) (PD: 1,3,9,11,12) (FR: *Mesembryanthemum*) QUEENSLAND: Fraser Is., Bribie Is., Brisbane, Stradbroke Is., (UQIC); Greenbank (QM); Noosa, Peregian (SAM); Caloundra (UQIC, SAM). NEW SOUTH WALES: Kingscliffe, Brunswick Heads (UQIC).

Diagnosis. A member of the *'flindersi'* species-group; distinguished from other members of the genus by the following combination of characters: dorsal surface of propodeum not defined by a carina; BP incomplete.

Female. BL 5.7-7.2 mm (holotype c. 6.8 mm); FL 3.8-4.4 mm (holotype c. 4.2 mm); head wider than long (72:69); UID:LID as 40:34; clypeus about twice as wide as long (30:15), convex, protruded; supraclypeal area bulbous; antennal sockets separated by distance greater than diameter of socket. AOD:IAD:OAD:IOD:OOD as 13:8:25:14:12. Scape not reaching median ocellus; dorsolateral angle of pronotum produced to a small rounded tubercle; dorsal surface of propodeum shorter than scutellum; TS with three blunt small teeth and shorter than outer spur; BP incomplete, only partially defined anteriorly.

Sculpturing. Head roughened with vertical striae from lower frons and continuing around eye (Fig. 6e); clypeus shining, finely reticulate, openly punctured; scutum (Fig. 9e) and scutellum finely reticulate, with small sparse piliferous punctures; dorsal surface of propodeum (Fig. 11e) with weak radiating rugulae, few interconnectives, most not reaching rim.

Colour. Frons golden green; vertex, genae and propodeum dark green, supraclypeal area coppery; clypeus golden blue suffused with red anteriorly and purple posteriorly; scape black, flagellum black above, light red-brown beneath; scutum and scutellum blue green with a golden tinge; trochanters and femora dark olive green, tibiae black to dark brown, knees and tarsi light red-brown; gastral terga dark brown, light red-brown along anterior margins.

Pubescence. Frons, vertex, lower paraocular areas sparsely covered with erect, branched hair; clypeus and supraclypeal area almost bare, some short, erect, simple hair, a few long, simple hairs along anterior margin of clypeus; genae with erect, minutely branched hair; scutum and scutellum with long, erect, branched hair; etanotum with short, branched, adpressed hair; propodeum almost bare except dorsolaterally and vertically with erect, branched hair; gastral terga with increasing density of short, simple hair from tergum I to VI, a few long, erect, minutely branched hair on terga IV, V, VI.

Male. BL 5.4-6.1 mm; FL 3.4-4.3 mm; head wider than long (63:60); eyes converging strongly below, UID:LID as 41:29; scape not reaching level of median ocellus; Fg:UID as 1.4:1. AOD:IAD:OAD:IOD:OOD as

9:9:19:12:11. BP almost absent, weakly defined along anterior margin.

Sculpturing. Frons, clypeus and supraclypeal area finely reticulate; scutum finely reticulate, with shallow piliferous sparse punctures; scutellum reticulate with few sparse punctures; dorsal surface of propodeum with weak radiating rugulae not reaching rim.

Colour. Body dark green, tinged with blue on metanotum and propodeum, posterior margin of tergites brown; coxae, trochanters, femora dark green, anterior surface of fore tibiae, mid and hind tibiae dark brown, posterior surface of fore tibiae and tarsi light red brown; gastral tergum VII red- brown.

Pubescence. Frons, clypeus and supraclypeal area with short, white, plumose, adpressed hair; vertex, genae, scutum and scutellum with sparse, erect, branched hair; gastral sterna II and III with long plumose hair.

Genitalia. Figs. 14a, b, c, d.

Gastral Sternum VI. Fig. 24d.

Distribution. Coastal south-east Queensland and north-eastern New South Wales (Fig. 2a).

Homalictus caloundrensis (Cockerell)

Figures 2a; 5l; 6f; 9f; 11f; 14e-h; 24c

Halictus caloundrensis Cockerell, 1914a: 505.–1933: 306.

Halictus flindersi leucurus Cockerell, 1914b: 366.–1933: 310. syn. nov.

Halictus caloundrensis leucurus Cockerell, 1915a: 6. (Cockerell decided the subspecies *leucurus* was closer to *H. caloundrensis* than *H. flindersi* and changed the specific name to the former species.)

Halictus rufoaeneus Friese, 1924: 237.–Cockerell, 1933: 320. syn. nov.

Halictus viridiniteus Friese, 1924: 237.–Cockerell, 1933: 323. syn. nov.

Homalictus caloundrensis.–Michener, 1965: 179.

Homalictus leucurus.–Michener, 1965: 180.

Homalictus rufoaeneus.–Michener, 1965: 181.

Homalictus viridiniteus.–Michener, 1965: 181.

Material examined.

Holotype ♀ of *Halictus caloundrensis*, Caloundra, Queensland 30 Oct 1912, H. Hacker (QM).

Holotype ♀ of *Halictus flindersi leucurus*, Bribie Is., Queensland, 2 Nov 1913, H. Hacker (QM).

Holotype ♀ of *Halictus rufoaeneus*, Botanic Garden, 1897 (AMNH). (The type (head missing) now bears a second label not published by Friese: Australia. Sydney, 14 Sep 1906. Friese identified specimens used in his descriptions by attaching an orange or red label with the word 'typus'. This species was described from a single specimen and it is considered to be the holotype.)

Lectotype ♀ of *Halictus viridiuiteus*, Botanic Gardens, 1897 (AMNH). (Second label on type as in *H. rufoaeneus*. Described from several specimens but only one syntype could be located. Lectotype designated here.

Other specimens examined: (64 ♀♀, 18 ♂♂) (PD: 1,4,7-12) (FR: *Schinus, Eucalyptus, Melaleuca, Atalaya*) QUEENSLAND: Morven, Amby, Yelarbon, Inglewood, Noosa, Stradbroke Is., Goondiwindi (UQIC); Caloundra, Bribie Is., Brisbane, Southport (QM); Mitchell (SAM). NEW SOUTH WALES: Brunswick Heads, Narrabri, Coonabarabran, Gilgandra (UQIC); Conargo (ANIC). VICTORIA: Mildura, Hattah (NMV). SOUTH AUSTRALIA: Glenelg, Morgan, Loxton, Blanchetown, West Beach (SAM).

Diagnosis. A member of the '*flindersi*' species-group, most like *H. luteoaeneus*; distinguished from other members of the genus by the following unique character: 'wave-like' plicae on anterior half of scutum, directed obliquely, meeting at obtuse angle along midline (Fig. 6f). (additional to male: gastral sternum VI with a large median tuft and small lateral tufts of hair.)

Female. BL 6.4-7.3 mm (holotype c. 6.9 mm); FL 4.4-5.0 mm (holotype c. 4.8 mm); head wider than long (74:69); UID:LID as 42:38; clypeus about twice as wide as long (35:16), gently convex, protruded; antennal sockets separated by distance subequal to diameter of socket. AOD:IAD:OAD:IOD:OOD as 14:7:25:12:10. Scape reaching anterior margin of rear ocelli; dorsolateral angle of pronotum produced to a small rounded tubercle; dorsal surface of propodeum as long as scutellum, defined laterally and posteriorly by strong carinae; TS with three blunt teeth and shorter than outer spur; BP complete, rounded apically.

Sculpturing. Head roughened, small area above antennal bases granulate, in some specimens a few transverse striae beneath ocelli, frons (Fig. 6f) with vertical striae, extending to ocelli and continuing around eyes; clypeus shining, finely reticulate, openly punctured; scutum (Fig. 9f) from anterior margin to level of parapsidal lines with directed obliquely, transverse 'wave-like' plicae, meeting at obtuse angles along the midline, remainder of scutum smooth and sparsely punctured, except at post-

erior end of parapsidal line openly punctured; dorsal surface of propodeum (Fig. 11f) with arcolate rugae extending to rim.

Colour. Frons dark olive green; vertex, genae and propodeum dark blue; clypeus royal blue suffused anteriorly with red and along basal suture with purple; supraclypeal area coppery green; scape black, flagellum black above, light red-brown beneath; scutum and scutellum variable golden green (in holotype of H. caloundrensis) to royal blue; trochanters, and femora dark green, tibiae and basitarsi (except knees, light red-brown) dark brown-black, remainder of tarsi suffused with light red-brown; gaster steel blue.

Pubescence. Frons, vertex, paraocular areas and genae with long, branched hair; clypeus and supraclypeal area almost bare, a few long, simple hairs; scutum sparsely covered with long, erect, branched hair; scutellum almost bare, a few long hairs; propodeum bare dorsally, vertically with long, erect, branched hair; gastral terga I and II almost bare, terga III, IV and V with increasing density of short, simple hair.

Male. BL 5.6-6.0 mm; FL 3.8-4.1 mm; head wider than long (67:59); eyes converging strongly below, UID:LID as 39:28; scape not reaching level of median ocellus; Fg:UID as 1.7:1. AOD:IAD:OAD:IOD:OOD as 12:7:21:11:10. BP incomplete, only defined anteriorly.

Sculpturing. Head roughened, frons with vertical striae continuing around hind margin of eye, except above antennal bases coarsely reticulate, several transverse striae below ocelli; vertex with transverse striae; clypeus and supraclypeal area reticulate, openly punctured; scutum with transverse plicae on anterior half meeting at an obtuse angle along midline, parapsidal area and hind margin reticulate with open punctures, mesially reticulate with sparse punctures; scutellum sparsely punctured; dorsal surface of propodeum defined by carinae, with arcolate rugae extending to rim.

Colour. Frons, scutum and scutellum dark green; vertex, genae, metanotum and propodeum dark blue; coxae, trochanters and femora black tinged with green, anterior surface of fore tibiae, mid and hind tibiae and tarsi dark brown, posterior surface of fore tibiae and fore tarsi light red-brown; gaster steel blue,tergum VII brown.

Pubescence. Frons, vertex, scutum and scutellum, with erect branched hair; clypeus, supraclypeal area and lower paraocular areas with short, inclined branched hair; gastral sterna II covered with short, plumose hair, sterna III and IV with transverse row of hair along posterior margin and prominent tufts of plumose hair lateral, sterna VI with erect tuft of hair medianly.

Genitalia. Figs. 14c, f, g, h.

Gastral Sternum VI. Fig. 24c.

Distribution. Queensland, New South Wales, north-west Victoria and South Australia (Fig. 2a).

Homalictus cassiaefloris (Cockerell)

Figures 3b; 8a; 10g; 12f; 19d-f; 26f

Halictus cassiaefloris Cockerell, 1914a: 514.–1929a: 12.–1933: 306.–Rayment,1953: 22.

Halictus tenuis Friese, 1924: 240 (not Ellis, 1913: 208). syn. by Cockerell, 1929a: 12.

Homalictus cassiaefloris.–Michener, 1965: 179.

Homalictus tenuis.–Michener, 1965: 181.

Material examined.

Lectotype ♀, Paralectotype ♀, of *Halictus cassiaefloris*, Mackay, Queensland, Dec 1899, *Cassia*, 14a, Turner (BMNH). (Cockerell described this species from two female specimens (syntypes) and attached a 'type' label to each. One has been chosen as a lectotype, the other as a paralectotype and both are designated here.)

Lectotype ♀ of *Halictus tenuis*, Mackay, Queensland, 2 Jan 1900, *Cassia*, Turner (AMNH) (examined). (attached is Cockerell's handwritten label *Halictus cassiaefloris*). Species described from several specimens but only one syntype was located. Lectotype designated here.

Other specimens examined: (10 ♀♀, 4 ♂♂) (PD: 1.9-12) (FR: *Cassia, Terminalia, Securinega, Eucalyptus, Tristanopsis*) QUEENSLAND: Mackay, Kuranda, Redlynch (BMNH); Shiptons Flat (ANIC); Peaches Crossing via Coen (UQIC). NORTHERN TERRITORY: Mataranka (UQIC); Mt. Cahill, East Alligator R. (ANIC). WESTERN AUSTRALIA: Carson escarpement (ANIC).

Diagnosis. A member of the '*blackburni*' species-group, most like *H. eurhodopus*; distinguished from other members of the genus by the following combination of characters: Female–fore basitarsal comb absent; BL <5.5

mm; scutum impunctate; coxae, trochanters and basal two thirds of femora dark brown, remainder light red-brown. Male–Fg:UID >2.0:1; clypeus without yellow or white markings; fore trochanters densely covered with long, plumose hair.

Female. BL 4.2-5.1 mm (lectotype c. 5.1 mm); FL 3.5-4.2 mm (lectotype c. 4.2 mm); head wider than long (53:44); UID:LID as (30:28); clypeus slightly convex, width less than three times length (23:10); antennal sockets separated by distance greater than diameter of socket; supraclypeal area raised. AOD:IAD:OAD:IOD:OOD as 10:5:19:8:8. Scape reaching anterior margin of median ocellus; dorsolateral angle of pronotum projecting as a prominent pointed spine; fore basitarsal comb absent; BP complete, apically pointed; TS with three blunt teeth, decreasing in size distally, distal tooth minute and same length as outer spur.

Sculpturing. Head smooth (Fig. 8a), frons, supraclypeal area and basal two thirds of clypeus weakly tessellate, apical one third of clypeus polished; frons and supraclypeal area impunctate; clypeus roughened with broad, shallow punctures on anterior one third, remainder impunctate; scutum (Fig. 10g) and scutellum finely reticulate, impunctate; dorsal surface of propodeum (Fig. 12f) mesially with areolate rugulae, interspaces reticulate, laterally smooth and polished.

Colour. Body black; scape red-brown, suffused with black apically, flagellum dark brown above, light brown beneath; pronotal tubercle dull white; coxae black, trochanters and basal two thirds of femora dark brown, apical one third of fore and mid femora, apical half of hind femora, tibiae and tarsi light red-brown.

Pubescence. Sparse; frons with short, erect, simple hair; vertex and genae with erect, minutely branched hair; lower paraocular areas with short, plumose, adpressed hair; clypeus and supraclypeal area with short, branched hair, a few long, simple hairs along anterior margin of clypeus; mandibles with erect, simple hair; scutum and scutellum with short, erect, simple hair, a few long, erect, simple hairs along posterior margin of scutellum; metanotum with both long, branched and simple hair; propodeum with short, plumose hair dorsolaterally and vertically; gastral terga I, II, III, almost bare, terga IV, V with short, simple hair; gastral and femoral scopae weakly developed, except dense pubescence on underturned areas of terga.

Male. BL 4.6-4.8 mm; FL 3.8-3.8 mm; head wider than long (53:46); eyes converging strongly below, UID:LID as 31:19; scape not reaching level of median ocellus; Fg:UID as 2.8:1. AOD:IAD:OAD:IOD:OOD as 7:7:19:9:8. Dorsolateral angle of pronotum projecting as prominent pointed spine; BP complete, apically rounded.

Sculpturing. Head smooth, finely reticulate, impunctate; scutum and scutellum, microtessellate, indistinctly punctured with well spaced, minute, piliferous punctures; dorsal surface of propodeum with areolate rugulae mesially, laterally reticulate.

Colour. Head, mesosoma, gaster black; legs dark brown except tarsi light red-brown.

Pubescence. Sparse; frons, vertex with short, erect, simple hair; lower paraocular areas, supraclypeal area and clypeus with short, branched hair, a few long, simple hairs along anterior margin of clypeus; mandibles with erect, branched hair on basal one third; genae with long, branched hair (forming a beard); fore trochanters with long,plumose hair; scutum and scutellum with short, erect, simple hair, a few long, erect, simple hairs along posterior margin of scutellum; metanotum with both long, simple and branched hair along posterior margin; propodeum with short, branched hair on vertical surface.

Genitalia. Figs. 19d, e, f.

Gastral Sternum VI. Fig. 26f.

Remarks. No intraspecific variation was found. Few specimens were examined, but those available were distributed across northern Australia.

Distribution. Across northern Australia (Fig. 3b).

Homalictus ctenander Michener

Figures 3a; 7i; 10a; 12a; 18a-e; 26b

Homalictus ctenander Michener, 1965: 318-319, pl. 14 figs. 10, 12, text figs. 606-608, 628, 629.

Material examined.

Holotype ♀, Allotype ♂, Kerang, Victoria, 29 Mar 1948, R. Trebilcock. (NMV).

Paratypes, 1 ♂, 1 ♀, Kerang, Victoria, 8 Jan 1947, 18 Jan 1947, (respectively), R. Trebilcock. (NMV).

Other specimens examined: (75 ♀♀, 10 ♂♂) (PD: 1-4,10-12) (FR: *Amyema, Eremophila, Eucalyptus, Melaleuca, Pittosporum, Malus, Atalaya, Brachychiton, Strelitzia*) NEW SOUTH WALES: Tenterfield, Wentworth (SAM); Cobar (SAM, UQIC, WAM); Broken Hill, Wilcannia (ANIC). VICTORIA: Mildura (ANIC); Hattah, Lake Kangaroo, Kerang (NMV). SOUTH AUSTRALIA: Mt Serle, Swan Reach, Oodla Wirra, Pondanna Out Stn, Aldinga Scrub, Morgan, Minnipa (SAM); Middleback Range, Lake Gilles Nat. Pk (SAM, WAM); Thurlga Stn (WAM). NORTHERN TERRITORY: Alice Springs (UQIC). WESTERN AUSTRALIA: Eucla (WAM).

Diagnosis. A member of the '*sphecodoides*' species-group; distinguished from other members of the genus by the following unique character: dorsolateral angles of pronotum projecting as erect lamellae (additional–scutal colour metallic purple).

Remarks. H. ctenander differs from all other Australian *Homalictus* by the following characters: Both sexes–tuberele at rear of vertex; dorsolateral angle of pronotum as above; ocellocciptal distance twice interocellar distance. Male–eyes not converging below, UID:LID as 42:47; large mandibles; pectinate inner hind tibial spur.

The species was adequately described by Michener and is not redescribed here, although additional figures are presented.

Female. Head: Fig. 7i; Scutum: Fig. 10a; Dorsal surface of propodeum: Fig. 12a.

Male. Genitalia. Figs. 18a, b, e.
Gastral Sternum VI. Fig. 26b.

Distribution. Mainly dry inland areas of southeastern and central Australia (Fig. 3a).

Homalictus dampieri (Cockerell)

Figures 3b; 7k; 10d; 18g-i; 26d

Halictus dampieri Cockerell, 1905c: 270.–1910: 228 (description of male).–1912: 385.–1926b: 2.–1933: 308.–Krombein, 1951: 280, pl. 1 fig. 3.

Halictus indigoteus Friese, 1924: 243. syn. by Cockerell, 1929a: 12.–1933: 308.

Halictus strangulatus Friese, 1924: 244. syn. by Cockerell, 1929a: 12.–1933: 308.

Homalictus dampieri.–Michener, 1965: 180.

Homalictus indigoteus.–Michener, 1965: 180.

Homalictus strangulatus.–Michener, 1965: 181.

Material examined.

Holotype ♀ of *Halictus dampieri*, Mackay, Ridg., May 1891, Queensland, G. Turner, (706) (BMNH). Head and gaster missing.

Lectotype ♀ of *Halictus indigoteus*, Mackay, Queensland, Oct. 1900, Turner (AMNH). Described from several female syntypes but only one was located. Lectotype designated here.

Lectotype ♀ of *Halictus strangulatus*, Mackay, Queensland, May 1899, Turner, (706), *Xanthorrhoea* sp. (AMNH). Lectotype designated by Pauly (in press).

Other specimens examined: (1152 ♀♀, 366 ♂♂) (PD: 1,3-5,8-12) (FR: *Terminalia, Amyema, Acacia, Angophora, Callistemon, Eucalyptus, Eugenia, Leptospermum, Melaleuca, Tristanopsis, Jacksonia, Alphitonia*) NEW SOUTH WALES: Moree, Liston (UQIC); Tenterfield (SAM). QUEENSLAND: Brisbane (UQIC, ANIC, SAM, NMV, BPBM); Stanthorpe, Amiens, Palen Ck, Bribie Is., Cedar Ck, Beachmere, Yelarbon, Maryland, Redcliffe, Gatton, Ipswich, Ma Ma Ck, Withcott, Bald Mtn, Landsborough, Helidon, Oakey, Inglewood, Condamine, Chinchilla, Tin Can Bay, Glenmorgan, Gayndah, Munduberra, Biggenden, Eidsvold, Childers, Tansey, Monto, Pomona, Bundaberg, Moura, Biloela, Springsure, Rockhampton, Anakie, Rubyvale, Blackall, Yeppoon, Emerald, Clermont, Proserpine, Mt. Isa, Seaforth, Babinda, Herberton, Tolga, Georgetown, Lakeland (UQIC); Warwick, Roma, Leyburn, Mackay (UQIC, NMV); Bunya Mts, Irvinebark, Almaden, Petford, Chillagoe, Mt Surprise, Mt Molloy, Croydon, Greenvale (QDPI); Mareeba, Laura (UQIC, QDPI); Bowen, Townsville (UQIC, SAM); Mt Carbine (UQIC, QDPI, SAM); Esk, Beerburrum, Wyberba Nat. Pk, Shute Harbour, Marlborough, Kuranda, Cairns, Cooktown (SAM); Hope Vale Mission (ANIC). NORTHERN TERRITORY: Renner Springs, Elliott, Daly Waters, Borroloola, Mataranka, Wildman R., Darwin (UQIC); Mudginberri Hmsd, Mt Cahill, Cape Crawford (ANIC); Dunmarra, Katherine (UQIC, SAM); Roper R. (SAM). WESTERN AUSTRALIA: Kununurra (UQIC); Millstream, Walsh Pt (ANIC); Phillip Range, Onslow (SAM).

Diagnosis. A member of the '*blackburni*' species-group; distinguished from other members of the genus by the following combination

of characters: Female–fore basitarsal comb absent; sculpture on dorsal surface of propodeum minutely anastomosed (Fig. 12d); non black colour. Male–genae with long, branched hair; anterior half of clypeus pale dull yellow; frons and scutum dark green.

Female. BL 4.6-5.9 mm; FL 3.5-4.5 mm (holotype c. 4.4 mm); head wider than long (62:52); UID:LID as 33:34; clypeus slightly convex, width three times length (31:10); antennal sockets separated by distance less than diameter of socket; supraclypeal area bulbous. AOD:IAD:OAD:IOD:OOD as 11:7:21:10:8. Scape reaching level of anterior margin of median ocellus; dorsolateral angle of pronotum projecting as small rounded tubercle; fore basitarsal comb absent; BP complete, apically rounded; TS with three teeth, proximal tooth blunt, distal two sharply pointed and same length as outer spur.

Sculpturing. Head smooth (Fig. 7k), frons, supraclypeal area and basal one third of clypeus weakly tessellate, apical two thirds of clypeus polished; supraclypeal area sparsely marked with hair pits, clypeus with open punctures on anterior half; scutum (Fig. 10d) and scutellum tessellate, sparsely marked with hair pits; dorsal surface of propodeum (Fig. 12d) with transverse lineolation laterally, minutely anastomosed rugulae mesially extending almost to rim.

Colour. Frons, supraclypeal area, mesosoma dark olive green; apical two thirds of clypeus black, remainder dark olive green; scape and flagellum above black, flagellum beneath dark brown; legs black or dark brown; gaster green-blue.

Pubescence. Sparse, head except supraclypeal area with erect, minutely branched hair, basal half of clypeus with similar hair, remainder with simple hair, a few long, simple hairs along anterior margin; scutum and scutellum with short, erect, minutely branched hair, a few long, branched hairs along posterior margin of scutellum and metanotum; propodeum with long, erect, branched hair dorsolaterally and laterovertically; gastral terga I, II, III almost bare, terga IV, V with increasing density of hair.

Male. BL 4.5-5.4 mm; FL 3.4-4.5 mm; head wider than long (60:51); eyes converging strongly below, UID:LID as 33:23; scape not reaching level of median ocellus; Fg:UID as 2.7:1. AOD:IAD:OAD:IOD:OOD as 8:8:19:10:8. BP complete, apically, bluntly acute.

Sculpturing. Head smooth, finely reticulate; clypeus with a few shallow punctures on anterior half; scutum and scutellum finely reticulate, impunctate; dorsal surface of propodeum with minutely anastomosed rugulae mesially extending almost to rim, laterally reticulate.

Colour. Head except clypeus and antennae dark olive green; anterior half of clypeus pale yellow, remainder dark green; antennae dark brown to black; scutum and scutellum brass green; propodeum and gaster dark green; coxae, trochanters, femora black, knees and tibiae red-brown, tarsi light red-brown.

Pubescence. Frons, vertex with erect, minutely branched hair; lower paraocular areas, supraclypeal area and clypeus with inclined, branched hair, a few long, simple hairs along anterior margin of clypeus; genae with long, branched hair (not forming a beard); scutum and scutellum with short, erect, minutely branched hair; metanotum with a few long, branched hairs; propodeum with erect, branched hair on vertical surface; gastral sterna almost bare, sterna IV, V with sparse cover.

Genitalia. Figs. 18g, h, i.

Gastral Sternum VI. Fig. 26d.

Remarks. Colour variation is minimal. Female specimens from Queensland and New South Wales are often tinged with blue, those from north west Australia are sometimes tinged with a bright golden-red colour.

Distribution. North-eastern New South Wales, south-east Queensland and across Northern Australia (Fig. 3b).

Homalictus dotatus (Cockerell)

Figures 2b; 6l; 9l; 11l; 15d-f; 25b

Halictus dotatus Cockerell, 1912: 384.–1933: 309.

Halictus occidentalis Rayment, 1930a: 51 (not Cresson, 1872: 250).–Cockerell, 1933: 317, syn. nov.

Halictus codenticalis Rayment, 1935: 634, pl. 36 (new name for *H. occidentalis* proposed by Rayment, 1935). syn. nov.

Homalictus dotatus.–Michener, 1965: 180.

Homalictus codenticalis.–Michener, 1965: 179.

Material examined.

Holotype ♀ of *Halictus dotatus*, Sydney, 29 Nov 1910, Froggatt (USNM).

Holotype ♀ of *Halictus occidentalis*, Perth, Western Australia, 19 Oct 1929, T. Greaves (ANIC).

Other specimens examined: (2012 ♀♀, 167 ♂♂) (PD: 1-5,8-12) (FR: *Schinus, Ptilotus, Wahlenbergia, Terminalia, Codonocarpus, Amyema, Acacia, Angophora, Callistemon, Eucalyptus, Melaleuca, Tristanopsis, Grevillea, Hakea, Atalaya, Keraudrenia*) QUEENSLAND: Coen, Laura, Mt Carbine, Normanton, Georgetown, Forsayth, Townsville, Sarina, Clermont, Rockhampton, Emerald, Longreach, Springsure, Blackall, Rubyvale, Biloela, Millaroo, Monto, Windorah, Childers, Tansey, Mundubbera, Gayndah, Glenmorgan, Yuleba, Roma, Amby, Mungallala, Charleville, Quilpie, Thargomindah, Cunnamulla, Bollon, Inglewood, Brisbane, Stanthorpe, Warwick, Bunya Mts, Helidon (UQIC); Evelyn (BPBM); Charters Towers, Julia Creek, Mt Isa (UQIC, QDPI); Condamine, Dalby, Leyburn (UQIC, NMV); Miles (ANIC, SAM) Beerburrum, Maryborough, Wallangarra, Jimboomba, Bowen (SAM). NEW SOUTH WALES: Narrabri, Cobar, Coonabarabran, Pilliga Scrub, Nyngan, Sydney (UQIC); Tenterfield, Wilcannia, Wentworth (SAM). VICTORIA: Melbourne, Warracknabeal, St Arnard, Donald, Robinvale (NMV). SOUTH AUSTRALIA: Coward Spring, Immarna, Kyaneutta, Lake Gilles Nat. Pk, Wirraminna, Taylorville, Ooldea, Amata, Woomera, Marree, Oodnadatta, Winnipa (SAM). WESTERN AUSTRALIA: Gnowangerup, Kojonup, Katanning, Yallingup, Wiekepin, York, Perth, Kalgoorlie, Guilford, Moora, Kellerberrin, Nukarni, Greenmount, Dandaragan, Boulder, Carnamah, Mingenew, Geraldton, Nabawa, Carnarvon, Newman, Broome, Derby, Kununurra (UQIC); Spring Ck, Fitzroy Crossing (NMV); Onslow, Merredin, Meekatharra, Capel, Kimberley (SAM); Menzies, Langi Crossing (CAS). NORTHERN TERRITORY: Darwin, Pine Ck, Mataranka, Borroloola, Daly Waters, Elliott, Renner Springs, Frewana, Wauchope, Barrow Ck, Aileron, Glenormiston, Standley Chasm (UQIC); Dunmara, Wave Hill (SAM); Tennant Ck, Katherine (UQIC, SAM); Maningrida (BPBM); Alice Springs (UQIC, BPBM, CAS); Devils Marbles, Macdonald Downs, Ti-Tree, Ooratippra (CAS).

Diagnosis. A member of the '*dotatus*' species-group, most like *H. imitatus*; distinguished from other members of the genus by the following combination of characters: Female–clypeus light red-brown on anterior two thirds; scutum anteriorly impunctate, remainder open-sparsely punctured; dorsal surface of propodeum with areolate rugulae posteriorly, transverse rugulae anteromesially and parallel rugulae laterally (Fig. 11l). Male–clypeus pale yellow on basal half; scutum openly punctured; frons, paraocular areas and supraclypeal area covered with short, adpressed hair.

Female. BL 4.9-5.4 mm (holotype c. 5.3 mm); FL 3.5-4.0 mm (holotype c. 4.0 mm); head wider than long (56:48); UID:LID as 31:33; clypeus width three times length (30:10); antennal sockets separated by distance greater than diameter of socket. AOD:IAD:OAD:IOD:OOD as 12:6:19:11:6. Scape reaching anterior margin of median ocellus; dorsolateral angle of pronotum projecting as a small blunt tubercle; TS with three rounded teeth and same length as outer spur; BP complete and apically rounded.

Sculpturing. Frons (Fig. 6l) and vertex reticulate; clypeus and supraclypeal area (except reticulate posterior margin of clypeus) smooth, anteriorly with shallow depressions; scutum (Fig. 9l) anteriorly and laterally weakly reticulate, remainder smooth and shining, anteriorly impunctate, remainder covered with shallow open-sparse punctures; dorsal surface of propodeum (Fig. 11l) with areolate rugulae posteromesially, transverse rugulae anteromesially and parallel rugulae laterally, none extend to vertical surface.

Colour. Frons, vertex and genae copper-green; supraclypeal area coppery-red; anterior two thirds of clypeus, scape and flagellum light red-brown, remainder of clypeus dark brown, scutum golden green; margins of pronotal tubercles yellow; scutellum and propodeum dark green; legs orange red-brown, fore and hind coxae brown, mid coxae red-brown, gaster red-brown suffused with dark patches apically.

Pubescence. Frons sparsely covered with short, erect hair, some plumose, adpressed hair in lower paraocular areas; clypeus and supraclypeal area almost bare; scutum and scutellum sparsely covered with short, backwardly directed hair; scutellum with a few erect, branched hairs.

Male. BL 3.7-4.6 mm; FL 2.7-3.4 mm; head wider than long (48:42); eyes converging below, UID:LID as 28:16; scape below level of median ocellus; Fg:UID as 2.7:1.

AOD:IAD:OAD:IOD:OOD as 9:7:15:10:6. BP complete, apically rounded.

Sculpturing. Frons and paraocular areas reticulate; clypeus and supraclypeal area smooth, close-openly punctured; scutum reticulate and impunctate anteriorly, remainder smooth and openly punctured; scutellum sparsely punctured, smooth and shining; dorsal surface of propodeum smooth, a few transverse rugulae posteromesially.

Colour. Frons, vertex, genae, supraclypeal area and basal half of clypeus dark green, remainder of clypeus pale yellow; scape and flagellum red-brown; pronotal tubercle pale yellow; scutum dark green; scutellum and propodeum black tinged with dark green; fore and hind coxae dark green, mid coxae and all legs light red-brown; gaster light red brown.

Pubescence. Frons, supraclypeal area and basal one third of clypeus with short, plumose, adpressed hair but not a complete cover; lower paraocular areas completely covered with similar hair; genae with some erect, branched hair; scutum with short, backwardly directed, simple hair, anterior lateral corners with thick, short, plumose, adpressed hair; scutellum and metanotum almost bare except for a few long, simple hairs.

Genitalia. Figs. 15d, e, f.

Gastral Sternum VI. Fig. 25b.

Remarks. The anterior half of the clypeus in females varies from brown to red- brown while in both sexes dark patches on the gaster are variable, dependent on internal air bubbles and gut contents.

Among the females, colour and pubescence variations are often seen on the head, scutum, coxae and gaster.

The scutal colour of the *H. dotatus* holotype is green and from the large number of specimen examined, this is the 'usual' colour. Some suffusing with blue is the main variation although colours from blue-green to a bright royal blue are found. A few specimens had the frons and scutum red but these specimens are considered unusual.

The pubescence of the female given in the description is considered to be the 'usual' form. Numerous specimens examined did not fit this description and the variations seen were as follows: head bare, scutum usual; head usual, scutum bare; head and scutum bare. Sclerites that are bare show a greater lustre than normal.

The 'usual' colour of the fore and hind coxae in both sexes is dark green except in a series of specimens from southern Queensland and northern New South Wales in which all coxae are bright yellow. All other external characters and the male genitalia match the 'usual' form and they are considered to be a variation within the species.

Distribution. Australia generally excluding Tasmania (Fig. 2b).

Homalictus eurhodopus (Cockerell)

Figures 3b; 7l; 10f; 12e; 19a-c; 26e

Halictus eurhodopus Cockerell, 1914a: 514.–1933: 309.
Homalictus eurhodopus.–Michener, 1965: 180.

Material examined.

Holotype ♀, Cairns, Kuranda, Jan 1902, Turner (BMNH).

Other specimens examined: (35 ♀♀, 5 ♂♂) (PD: 1.4-5.8-9.11) (FR: *Eucalyptus, Tristanopsis, Dillwynia*) QUEENSLAND: Gunnawarra, Dunk Is., Palmerston Nat. Pk, Peaches Crossing via Coen, Iron Range (UQIC); Daintree (QDPI); Eubenangee (NMV); Wongabel St. For., Mt Finnigan, Shiptons Flat, Mt Webb Nat. Pk, Hope Vale Mission, Mission Beach (ANIC); Kuranda (BMNH, NMV); Redlynch, Mackay (BMNH).

Diagnosis. A member of the '*blackburni*' species-group, most like *H. cassiaefloris*; distinguished from other members of the genus by the following combination of characters: Female–fore basitarsal comb absent; BL <5.5 mm; scutum impunctate; legs light red-brown, except fore and hind coxae black to dark brown. Male–Fg:UID >2.0:1; anterior margin of clypeus dull white; genae with long, branched hair (forming a beard).

Female. BL 4.6-5.1 mm (holotype c. 5.1 mm); FL 3.4-3.8 mm (holotype c. 3.8 mm); head wider than long (56:47); UID:LID as 31:31; clypeus slightly convex, width less than three times length (25:10); antennal sockets separated by distance equal to diameter of socket; supraclypeal area raised. AOD:IAD:OAD:IOD:OOD as 11:5:21:8:9.

Scape reaching posterior margin of median ocellus; dorsolateral angle of pronotum projecting as prominent pointed tubercle; fore basitarsal comb absent; BP complete, apically pointed; TS with four blunt teeth, decreasing in size distally, distal tooth minute and shorter than outer spur.

Sculpturing. Head smooth (Fig. 7l), frons, supraclypeal area and basal two thirds of clypeus weakly tessellate, apical one third polished; frons and supraclypeal area impunctate, basal two thirds of clypeus with sparse, small hair pits, remainder of clypeus roughened with broad, shallow punctures; scutum (Fig. 10f) and scutellum finely reticulate, impunctate; dorsal surface of propodeum (Fig. 12e) mesially with areolate rugae extending to rim, a few parallel rugulae laterally.

Colour. Head (except antennae), mesosoma, gaster black; scape red-brown, suffused with black apically, flagellum black above, dark brown beneath; pronotal tubercle dull white; legs light red-brown, except fore and hind coxae black to dark brown.

Pubescence. Sparse; frons, vertex, genae with short, erect, minutely branched hair; lower paraocular areas with short, plumose, adpressed hair; clypeus and supraclypeal area with distinctly branched hair, a few long, simple hairs along anterior margin of clypeus; mandibles with erect, simple hair; scutum and scutellum with short, erect, simple hair, a few long, simple hairs along posterior margin of scutellum; metanotum with both long, branched and simple hair; propodeum with short, plumose hair dorsolaterally and on vertical surface; gastral terga I, II, III almost bare, terga IV, V with short, simple hair; gastral and femoral scopae weakly developed, except dense pubescence on underturned areas of terga.

Male. BL 4.5-4.7 mm; FL 3.2-3.3 mm; head wider than long (47:42); eye converging strongly below, UID:LID as 27:17; scape not reaching level of median ocellus; Fg:UID as 2.7:1. AOD:IAD:OAD:IOD:OOD as 5:5:17:8:7. Dorsolateral angle of pronotum projecting as a pointed tubercle; BP complete, apically pointed.

Sculpturing. Head smooth, finely reticulate, impunctate; scutum and scutellum microtessellate, impunctate; dorsal surface of propodeum mesially with areolate rugulae extending to rim, reticulate laterally.

Colour. Head black, except anterior margin of clypeus dull white, antennal scape red-brown; pronotal tubercle dull white; mesosoma (except pronotal tubercle) and gaster black; fore and hind coxae black, remainder of legs light red-brown.

Pubescence. Sparse; frons, vertex with short, erect, simple hair; lower paraocular areas with short, plumose, adpressed hair; clypeus and supraclypeal area sparsely covered with short, plumose hair; clypeus with long, simple hair along anterior margin; mandibles with long, branched hair on basal two thirds; genae with long, branched hair (forming a beard); scutum and scutellum with short, backwardly inclined hair, a few long, erect, simple hairs along posterior margin of scutellum; propodeum with some erect, branched hair dorsolaterally and upper vertical surface.

Genitalia. Figs. 19a, b,c.

Gastral Sternum VI. Fig. 26e.

Remarks. This species shows little variation except in males the colour of the scape may be as described or entirely black. Conspecificity of variant males was confirmed by examination of genitalia.

Turner seems to have had a number of "Cairns" labels printed and used them for the surrounding districts. He wrote in the exact locality beneath the printed word "Cairns". The correct type locality is Kuranda, not Cairns.

Distribution. North Queensland (Fig. 3b).

Homalictus exleyae sp. nov.

Figures 2a; 6g; 9g; 11g; 14i-l; 24f

Material examined.

Holotype ♀, Paratypes 6 ♀♀, 2 ♂♂, Australia: North Western Australia, 6 km S. of Broome, 15 Dec 1975, E. Exley and R. Storey, on *Eucalyptus* sp. (QM).

Other specimens examined: (19 ♀♀, 16 ♂♂) (PD: 2-4,6-7,10,12) (FR: *Eucalyptus, Melaleuca*) WESTERN AUSTRALIA: Broome, Derby (UQIC); Martins Well, West Kimberley, Cape Bertholet, West Kimberley

(ANIC). NORTHERN TERRITORY: Casuarina Beach, via Darwin, Cobourg Peninsula (ANIC). QUEENSLAND: Moa (Banks) Is., Torres Str. (UQIC, SAM, NMV); Mabuiag Is., Torres Str. (SAM), Mt Webb (ANIC).

Diagnosis. A member of the '*flindersi*' species-group, most like *H. flindersi*; distinguished from other members of the genus by the following combination of characters: Female–BP incomplete; dorsal surface of propodeum defined by carina; frons with vertical striae; scutum closely punctured along posterior margin and around posterior ends of parapsidal lines (Fig. 9g). Male–BP incomplete; dorsal surface of propodeum defined by carinae; gastral sternum VI without tufts of erect hair; femora apically and tibiae light red-brown.

Female. BL 5.6-5.9 mm (holotype c. 5.7 mm); FL 3.9-4.3 mm (holotype c. 4.1 mm); head wider than long (65:59); UID:LID as 34:32; clypeus about twice as wide as long (31:15), convex, protruded; antennal sockets separated by distance less than diameter of socket; supraclypeal area bulbous. AOD:IAD:OAD:IOD:OOD as 12:6:24:12:8. Scape reaching anterior margin of median ocellus; dorsolateral angle of pronotum produced into a small blunt tubercle; dorsal surface of propodeum as long as scutellum, defined by carinae; TS with three small blunt teeth and two third as long as outer spur; BP incomplete, only defined anteriorly.

Sculpturing. Head roughened, frons (Fig. 6g) with weak vertical striae, continuing around eye, except medianly above antennal bases granulate, weak transverse striae beneath ocelli; clypeus shining, finely reticulate, openly punctured; scutum (Fig. 9g) finely reticulate, more so anteriorly, area between parapsidal lines sparsely punctured, lateral to parapsidal lines and hind margin closely punctured; scutellum smooth and sparsely punctured; dorsal surface of propodeum (Fig. 11g) with areolate rugae extending mesially to carina, posterior lateral areas smooth.

Colour. Frons, vertex and genae olive green; clypeus royal blue, suffused with red anteriorly; supraclypeal area coppery green; scape black, flagellum above, dark brown basally, brown apically, beneath light red-brown; mandibles orange yellow, red apically, black basally; scutum and scutellum green-blue; propodeum dark blue; trochanters and basal two thirds of femora dark green, apical one third of femora, tibiae and tarsi light red-brown, hind tibiae and tarsi suffused with brown; gaster steel blue, posterior margins of terga with dark brown.

Pubescence. Frons, clypeus and vertex with short, sparse, simple hair; genae with sparse, long, simple hairs; lower paraocular areas with short, plumose hair; scutum with short, minutely branched hair; scutellum almost bare; propodeum bare dorsally, laterovertically with short, dense, plumose hair, posterovertically with sparse, branched hair; gastral terga I, II and III almost bare, terga IV and V with increasing density of hair.

Male. BL 4.6-5.1 mm; FL 3.4-3.7 mm; head broader than long (57:53); eyes converging below, UID:LID as 33:37; scape not reaching median ocellus; Fg:UID as 1.8:1. AOD:IAD:OAD:IOD:OOD as 9:12:19:11:9. BP incomplete, not defined apically.

Sculpturing. Head roughened, frons with inverted 'U'-shape striae above antennal bases extending to below ocelli, laterally with vertical striae continuing around hind margins of eyes, a few transverse striae below ocelli; vertex with transverse striae; clypeus and supraclypeal area shining, openly punctured; scutum reticulate with transverse plicae anteriorly, medianly sparsely punctured, in parapsidal areas openly punctured; scutellum shining with sparse punctures; dorsal surface of propodeum defined by carinae, with areolate rugae extending to posterior carina mesially, posterior lateral areas smooth.

Colour. Head green, vertex with tinge of blue; scutum and scutellum golden green; propodeum black tinged with blue; coxae trochanters and basal two thirds of femora dark green, apical one third of femora, tibiae and tarsi light red-brown (in some specimens mid and hind tibiae and tarsi suffused with brown); gaster black tinged with dark green, posterior margins of terga brown,tergum VII light brown.

Pubescence. Frons, clypeus, supraclypeal area vertex, genae, scutum and scutellum with erect, branched hair, lower paraocular areas with short, plumose, adpressed hair; gastral sterna III and IV with transverse row of long, white hair along posterior margin.

Genitalia. Figs. 14i, j, k, l.

Gastral Sternum VI. Fig. 24f.

Remarks. I take pleasure in naming this species after Dr E.M. Exley who caught many of the specimens used in this paper and first aroused my interest in Apoidea.

Distribution. Across northern Australia (Fig. 2a).

Homalictus exophthalmus sp. nov.

Figures 4a; 5k; 8d; 10j; 12k; 21a-c; 27a

Material examined.

Holotype ♀, Paratypes 4 ♀♀, 1 ♂, Nyngan, New South Wales, 30 Jan 1971, T.F. Houston, on *Wahlenbergia* sp. (SAM).

Diagnosis. A member of the '*urbanus*' species-group, most like *H. urbanus*; distinguished from other members of the taxon by the following combination of characters: Female–labrum with two raised tubercles; EW:GW c. 3.1:1 (Fig. 5k). Male–Fg:UID <2.0:1; EW:GW c. 3.25:1.

Female. BL 4.5-4.6 mm (holotype c. 4.5 mm); FL 3.0 mm (holotype c. 3.0 mm); head wider than long (56:43); eyes converging below, UID:LID as 35:25; clypeus convex, width greater than twice the length (23:10); antennal sockets separated by distance greater than antennal socket. AOD:IAD:OAD:IOD:OOD as 8:8:17:10:10. Scape extending to level below anterior margin of median ocellus; EW:GW as 3.1:1 (Fig. 5k); dorsolateral angle of pronotum projecting as small rounded tubercle; TS with two large rounded teeth and two thirds length of outer spur; BP complete, rounded apically.

Sculpturing. Head relatively smooth (Fig. 8d), frons finely reticulate; supraclypeal area finely reticulate with a few piliferous punctures, clypeus smooth and polished, sparsely punctured; scutum (Fig. 10j) and scutellum reticulate, scutum mesially and at posterior end of parapsidal lines openly punctured, remainder of scutum and scutellum sparsely punctured; dorsal surface of propodeum (Fig. 12k) with areolate rugae on basal half not reaching rim, laterally a few longitudinal rugulae reaching rim, rim smooth.

Colour. Frons dull blue-green, supraclypeal area dark brown, clypeus brown; scape brown suffused with light red-brown apically, pedicle and flagellum light red-brown; scutum and scutellum blue (holotype), blue-green (paratypes); propodeum black; coxae and trochanters brown, fore and mid femora brown suffused with light red-brown, remainder of legs light red-brown; gaster light red-brown (holotype), suffused with brown patches (paratypes).

Pubescence. Sparse; frons with short, erect, minutely branched hair; vertex with a few long, erect, minutely branched hairs; lower paraocular areas with short, minutely branched, adpressed hair; clypeus and supraclypeal area with a few apicad directed, minutely branched hairs, except anterior margin of clypeus with long, simple hair; scutum and scutellum with both erect, minutely branched and short, simple, backwardly inclined hair; metanotum and posterior margin of scutellum with a few long, erect, branched hairs; propodeum bare dorsally, posterovertically sparsely covered with short, erect, minutely branched hair; gastral tergum I almost bare, remaining terga with sparse cover of short, simple, adpressed hair, a few long hairs on terga IV, V and VI; femoral scopae weakly developed.

Male. BL c. 4.2 mm; FL c. 3.0 mm; head wider than long (42:38); eyes converging below, UID:LID as 32:24; scape not reaching level of anterior margin of median ocellus; Fg:UID as 0.9:1. AOD:IAD:OAD:IOD:OOD as 7:7:14:10:9. In side view clypeus markedly convex; EW:GW as 3.25:1. BP complete, apically rounded; TS with two small teeth and slightly shorter than outer spur.

Sculpturing. Frons, lower paraocular areas, vertex and genae finely reticulate; clypeus and supraclypeal area smooth and polished, both with a few minute punctures; scutum and

scutellum reticulate, sparsely punctured; dorsal surface of propodeum with weak areolate rugulae mesially not reaching rim, remainder smooth.

Colour. Frons, vertex and genae dark green tinged with blue; clypeus and supraclypeal area brown; scutum and scutellum green tinged with blue; propodeum black; coxae, trochanters and basal two thirds of femora brown, remainder of legs light red-brown; gaster brown.

Pubescence. Head and mesosoma almost bare, except a few short, simple or minutely branched hairs on anterior margin of clypeus, vertex, genae, metanotum and vertical posterior surface of propodeum; gastral terga with sparse, short, simple, adpressed hair.

Genitalia. Figs. 21a, b, c.

Gastral Sternum VI. Fig. 27a.

Remarks. The specific name refers to the appearance of the eyes.

Distribution. Central New South Wales (Fig. 4a).

Homalictus flindersi (Cockerell)

Figures 2a; 6d; 9d; 11d; 13h-k; 24e

Halictus flindersi Cockerell, 1905c: 271.–1910: 228 (*Halictus flindersi* var. a).

Halictus hilli Cockerell, 1929a: 2.–1933: 312. syn. nov.

Homalictus flindersi.–Michener, 1965: 180.

Homalictus hilli.–Michener, 1965: 180.

Material examined.

Holotype ♀ of *Halictus flindersi*, Seaforth Jan 1890, 400, Mackay, Queensland, G. Turner, 1892-16 (BMNH). Type is headless. Paratype ♂ labelled *Halictus flindersi* in Cockerell's handwriting, Seaforth Jan 1890, 439, Mackay, Queensland, G. Turner, 1892-16 (BMNH).

Holotype ♂ of *Halictus hilli*, Port Darwin, G.F. Hill (AMNH).

Other specimens examined: (60 ♀♀, 24 ♂♂) (PD: 1-3,5-8,11-12) (FR: *Tournefortia, Pariuari, Dysophylla, Hibiscus, Acacia, Eucalyptus, Melaleuca, Pongania*) QUEENSLAND: St Pauls, Moa (Banks) Is., Bamaga, Coen, Cooktown, North West Is., Wilson Is., Heron Is. (UQIC); Dunk Is. (UQIC, NMV); Prince of Wales Is., Fitzroy Is., Stradbroke Is. (NMV); Port Douglas (UQIC, SAM); Kuranda (BMNH); Townsville (ANIC, SAM); Mackay (BMNH, UQIC); Yeppoon, Rockhampton (BPBM); Caloundra, Dunwich, Brisbane (QM). NORTHERN TERRITORY: Paratype ♂ (probably a paratype of *H. woodsi*, but misidentified) Port Darwin, Dec 1902, Turner Coll., 1910-7. (BMNH); Horn Inlet Sir Edward Pellow Group, Cobourg Peninsula, Oenpelli, Mt Cahill, Wessel Island (ANIC). WESTERN AUSTRALIA: Drysdale River (ANIC).

Diagnosis. A member of the '*flindersi*' species-group, most like *H. exleyae*; distinguished from other members of the genus by the following combination of characters: Female–BP incomplete; dorsal surface of propodeum defined by carinae; frons with vertical striae below ocelli; scutum openly punctured along posterior margin and around ends of parapsidal lines (Fig. 9d). Male–BP incomplete; dorsal surface of propodeum defined by carinae; gastral sternum VI without tufts of erect hair; femora and tibiae black to dark brown.

Female. BL 6.1-7.7 mm (holotype estimated c. 6.3 mm); FL 4.3-5.2 mm (holotype c. 4.4 mm); head wider than long (79:67); UID:LID as 41:37; clypeus greater than twice as wide as long (36:15), convex, protruded; antennal sockets separated by distance equal to diameter of socket. AOD:IAD:OAD:IOD:OOD as 15:7:26:12:10. Scape reaching anterior margin of medium ocellus; dorsolateral angle of pronotum projecting as a small acute spine; dorsal surface of propodeum same length as scutellum and defined by carinae; TS with three blunt teeth and shorter than outer spur; BP incomplete, only defined anteriorly.

Sculpturing. Head roughened, frons (Fig. 6d) with vertical striae below ocelli, except small reticulate median area above antennal bases, vertical striae continuing around eye; clypeus and supraclypeal area finely reticulate, openly punctured; scutum (Fig. 9d) finely reticulate, sparsely punctured, except in parapsidal area and hind margin openly punctured; dorsal surface of propodeum (Fig. 11d) with areolate rugae extending to rim.

Colour. Frons variable from purple-blue to dark green; vertex, genae and propodeum variable from dark blue to dark blue-green; clypeus variable from royal blue to golden green suffused with red anteriorly; scape black to dark brown, flagellum dark brown above, red-brown beneath; scutum variable from blue tinged with green (holotype) to golden green; coxae, trochanters, femora and tibiae dark

brown to black, tarsi variable from dark brown (holotype) to light brown; gaster steel blue.

Pubescence. Frons, vertex, supraclypeal area with short, erect, minutely branched hair; clypeus with a few long, forwardly directed, simple hairs; genae with short, erect, branched hair; scutum evenly covered with short, erect, minutely branched hair; scutellum almost bare, a few long, branched hairs; propodeum dorsolaterally and vertically with dense, long, erect, branched hair; gastral terga I and II almost bare, terga III, IV and V with increasing density of short, simple hair.

Male. BL 5.7-6.2 mm; FL 3.8-4.2 mm; head wider than long (65:55); eyes converging strongly below, UID:LID as 38:25; scape not reaching level of median ocellus; Fg:UID as 1.8:1. AOD:IAD:OAD:IOD:OOD as 9:6:21:11:9. BP incomplete, defined weakly anteriorly.

Sculpturing. Head roughened, frons with crescent shaped striae above antennal bases, transverse striae below ocelli continuing past posterior margin of rear ocelli, vertical striae on frons laterally continuing around hind margin of eye; vertex with several transverse striae; clypeus and supraclypeal area reticulate, openly punctured; scutum dull, finely reticulate, medially sparsely punctured, margins of parapsidal lines sparsely punctured, hind margin densely punctured; scutellum shining with few punctures, dorsal surface of propodeum, defined by carinae, with areolate rugae extending to rim.

Colour. Variable. Qld specimens: clypeus, supraclypeal area and frons up to level at least half distance between antennal base and ocelli dark green, remainder of frons, vertex, genae and propodeum dark blue; scutum and scutellum golden green; N.T. specimens: head, scutum, scutellum and propodeum dark blue; All specimens: coxae, trochanters, femora, mid and hind tibiae black to dark brown, fore tibiae and tarsi light brown; gaster black tinged with dark blue, tergum VII red-brown.

Pubescence. Lower paraocular areas with small area of short, plumose, adpressed hair, remainder of head and mesosoma with sparse, short, erect, branched hair; gastral sterna III and IV with transverse row of long hair along posterior margins.

Genitalia. Figs. 13h, i, j, k.

Gastral Sternum VI. Fig. 24e.

Distribution. Coastal and north Queensland and coastal northern Australia (Fig. 2a).

Homalictus forrestae sp. nov.

Figures 4a; 21d-f; 27b

Material examined.

Holotype ♂, Queensland, 11.3 km N. of Barkley Hwy, on Burketown Rd. Burnt out area, some regrowth. At light. 23 Sep 1977. J.A. Forrest (SAM).

Diagnosis. A member of the *'urbanus'* species-group, most like *H. urbanus*; male distinguished from other members of the genus by the following combination of characters: Fg:UID <2.0:1; gastral tergum punctate mesially; scutum in parapsidal areas, hind margin and scutellum closely punctured; dorsal surface of propodeum about half length of scutellum; gastral tergum closely punctured mesially.

Male. BL c. 3.6 mm; FL c. 2.8 mm; head as long as wide (47:47); eyes converging below, UID:LID as 30:20; clypeus protruded; scape not reaching level of anterior margin of ocellus; Fg:UID as 1.4:1; EW:GW as 2.0:1. AOD:IAD:OAD:IOD:OOD as 7:4:17:10:8. Dorsolateral angle of pronotum projecting as small rounded tubercle; dorsal surface of propodeum about half length of scutellum; TS with at least three minute teeth and slightly shorter than outer spur.

Sculpturing. Frons reticulate; clypeus and supraclypeal area smooth and closely punctured; vertex with several weak transverse striae not extending onto genae; scutum reticulate, scutellum weakly reticulate, scutum impunctate on anterior one third, remainder punctured, in parapsidal areas openly punctured, mesially and on scutellum closely punctured; dorsal surface of propodeum with branched rugae extending to rim; gastral tergum I closely punctured mesially.

Colour. Frons and supraclypeal area blue-green; clypeus dark brown; scape and

flagellum above dark brown, flagellum beneath light brown; pronotal tubercle brown, except small distal area dull yellow; scutum and scutellum brass green; propodeum dark blue; coxae, trochanters and femora dark brown, apical margin of femora, tibiae and tarsi light red-brown, mid and hind tibiae suffused with brown; gaster dark brown, except tergum VII red-brown.

Pubescence. Frons on upper half with short, minutely branched hair, lower half of frons, lower paraocular areas, supraclypeal area and lateral margins of clypeus with short, plumose, adpressed hair; vertex with a few long, erect, minutely branched hairs; genae with short, erect, branched hair; scutum and scutellum sparsely covered with both erect, minutely branched and short, simple, backwardly inclined hair; metanotum with a few long, erect, branched hairs; propodeum posterovertically sparsely covered with erect, minutely branched hair; gastral terga with short, simple hair.

Genitalia. Figs. 21d, e, f.

Gastral Sternum VI. Fig. 27b.

Remarks. Female unknown.

Distribution. North-western Queensland (Fig. 4a).

Homalictus grossopedalus sp. nov.

Figures 3b; 5j; 12h; 20d-f; 26h

Material examined.

Holotype ♂, North Queensland, Kuranda, F.P. Dodd, 1916-27 (BMNH).

Diagnosis. A member of the '*blackburni*' species-group, most like *H. latitarsis*; male distinguished from other members of the genus by the following unique character: All tarsal segments flanged laterally.

Male. BL c. 6.1 mm (holotype); FL c. 4.2 mm (holotype); head wider than long (58:50); eyes converging strongly below, UID:LID as 39:28; clypeus slightly convex, width about twice length (25:12); supraclypeal area bulbous; antennal scape almost extending to anterior margin of median ocellus; antennal sockets separated by distance less than diameter of socket; Fg:UID as 2.6:1. AOD:IAD:OAD:IOD:OOD as 9:5:19:10:10. Dorsolateral angle of pronotum projecting as raised rounded lobe; all tarsal segments flanged laterally (Fig. 5j- fore tarsus only); BP complete, apically rounded.

Sculpturing. Head smooth, frons and supraclypeal area finely reticulate, clypeus polished and smooth anteriorly, with fine transverse lineolation posteriorly; frons, supraclypeal area and clypeus impunctate; scutum and scutellum dull, with fine lineolets, producing a circular pattern on each scutal half, entirely on scutellum; dorsal surface of propodeum (Fig. 12h) reticulate, a few transverse rugulae posteromesially, vertical surfaces reticulate.

Colour. Frons, vertex, mesosoma black, except pronotal tubercle pale yellow; supraclypeal area dark brown; basal half of clypeus brown, remainder of clypeus pale-yellow; basal half of scape light red-brown, anterior half and pedicel red-brown, flagellum dark brown; coxae, trochanters and fore femora brown, mid and hind femora and tibiae light red-brown; tarsal segments dull white; gaster dark brown.

Pubescence. Frons, vertex, supraclypeal area and clypeus with both short, erect, branched and simple hair, a few long, simple hairs along anterior margin of clypeus; paraocular areas with short, plumose, adpressed hair; mandibles with erect, branched hair on basal half; genae with long, curled, plumose hair (forming a beard); scutum and scutellum sparsely covered with short, erect, simple hair; metanotum mesially with short, plumose, adpressed hair, a few long, branched hairs laterally; vertical surface of propodeum with erect, branched hair anteriorly; fore coxae and femora, all tarsal segments and sternum between fore and mid coxae with long, plumose hair, remainder sparse; gaster sparse.

Genitalia. Figs. 20d, e, f.

Gastral Sternum VI. Fig. 26h.

Remarks. *H. grossopedalus* and *H. latitarsis* are the only Australian species of *Homalictus* in which the tarsal segments of the males are flanged. Several new species in Papua New Guinea (to be described by Dr A. Pauly) also exhibit this distinctive character. I have

examined these new species and all would be placed in the '*blackburni*' species-group.

Distribution. North Queensland (Fig. 3b).

Homalictus holochlorus (Cockerell)

Figures 4a; 8i; 10o; 12p

Halictus holochlorus Cockerell, 1914a: 507.–1933: 312.
Homalictus holochlorus.–Michener, 1965: 180.

Material examined.
Holotype ♀, Cheltenham, Victoria, French (ANIC).
Other specimens examined: (10 ♀♀) (PD: 1-2,9-10,12) (FR: *Acacia*) QUEENSLAND: Beerwah, Sunnybank (UQIC); Eukey (SAM). NEW SOUTH WALES: Sydney, Heathcote (ANIC); Wentworth Falls (NMV). VICTORIA: Warburton (UQIC); Brisbane Ranges (NMV); Omeo (ANIC).

Diagnosis. A member of the '*urbanus*' species-group, most like *H. stradbrokensis*; female distinguished from other members of the genus by the following combination of characters: labrum with two raised tubercles; frons with vertical striae; gastral tergum I impunctate; scutum mesad of parapsidal lines openly punctured.

Female. BL 5.2-6.1 mm (holotype c. 6.1 mm); FL 4.1-4.4 mm (holotype c. 4.4 mm); head wider than long (61:56); eyes converging below, UID:LID as 42:39; clypeus convex, width less than three times the length (30:12); antennal sockets separated by distance equal to diameter of socket. AOD:IAD:OAD:IOD:OOD as 17:5:22:11:11. Scape extending to level of anterior margin of median ocellus; EW:GW as 1.2:1; dorsolateral angle of pronotum projecting as small acute tubercle; TS with two large, blunt teeth and one small distal tooth and two thirds length of outer spur; BP complete, apically rounded.

Sculpturing. Head roughened (Fig. 8i), frons with vertical striae to level of anterior margin of rear ocelli, except small reticulate area above antennal bases; vertex with several transverse striae extending onto genae; basal two thirds of clypeus and supraclypeal area finely reticulate, sparsely pitted, anterior one third of clypeus smooth and polished with a few large punctures along anterior margin; scutum and scutellum dull, coarsely reticulate, scutum (Fig. 10o) impunctate anteriorly, parapsidal areas and posterior margin closely punctured, mesially openly punctured, scutellum sparsely punctured except along anterior margin margin and midline openly punctured; dorsal surface of propodeum (Fig. 12p) with areolate rugae extending mesially almost to rim, laterally well short of rim.

Colour. Frons, paraocular areas and supraclypeal area dark green tinged blue and gold; basal half of clypeus green tinged with gold, anterior half black; scape and flagellum above black-brown, flagellum beneath brown; scutum, scutellum and propodeum dark green, scutum tinged with blue; coxae, trochanters and femora black, tibiae and tarsi dark brown; gaster dark brown.

Pubescence. Head sparsely covered with short, erect, minutely branched hair, a few long, simple hairs along anterior margin of clypeus; scutum with both short, erect, minutely branched and short, simple backwardly inclined hair; scutellum with short, erect, minutely branched hair; metanotum with a few long, minutely branched hairs along posterior margin; propodeum bare dorsally except a few erect, branched hairs laterally, posterovertically densely covered with long, erect, plumose hair.

Remarks. Male unknown.

Distribution. South-east Queensland, coastal New South Wales and Victoria (Fig. 4a).

Homalictus houstoni sp. nov.

Figures 3a; 7b; 9n; 11n; 16d-f; 25e

Material examined.
Holotype ♀, Paratypes 3 ♀♀, 1 ♂, 64 km E. of Norseman, Western Australia, 10 Jan 1970, T.F. Houston, on *Eucarya* sp. (SAM).

Diagnosis. A member of the '*sphecodoides*' species-group, most like *H. sphecodoides*; distinguished from other members of the genus by the following combination of characters: Female–malus of strigilis fan-shaped; frons coarsely reticulate; scutum punctured on basal two thirds, close-openly laterally and posteriorly, sparse mesially (Fig. 9n). Male–Fg:UID >2.0:1; UID:LID >1.3:1; clypeus

concave anteromesially; head densely covered with short, plumose hair; pronotal tubercle and scape basally light red-brown; gonocoxal processes of genital capsule with large setae (Fig. 16d).

Female. BL c. (holotype) 4.3 mm; FL c. (holotype) 3.6 mm; head wider than long (52:47); UID:LID as 30:28; clypeus width three times the length (27:9); antennal sockets separated by distance equal to diameter of socket. AOD:IAD:OAD:IOD:OOD as 10:4:18:10:6. Scape reaching anterior margin of median ocellus; dorsolateral angle of pronotum projecting as small acute tubercle; TS with four small blunt teeth and same length as outer; BP complete, apically rounded.

Sculpturing. Head roughened, frons (Fig. 7b) coarsely reticulate, in side view reticulation appears to form weak sinuate vertical striae, lower paraocular areas smooth; basal half of clypeus (remainder smooth) and supraclypeal area finely reticulate, punctured, few on supraclypeal area, openly punctured on clypeus; scutum (Fig. 9n) tessellate and dull, except posteromesially smooth and shining though tessellate along midline, anterior one third impunctate, basal two thirds punctured, close-openly laterally and posteriorly, sparse mesially; scutellum smooth and shining (except posterior margin, reticulate) openly punctured; dorsal surface of propodeum (Fig. 11n) with areolate rugae medianly not reaching rim, laterally parallel rugae reaching rim.

Colour. Head (except antennae), scutellum, propodeum black, basal one quarter of scape light red-brown, remainder dark brown, flagellum brown; scutum dark green; fore and hind coxae dark brown, mid coxae light red-brown, trochanters, basal half of fore and mid femora brown, basal two thirds of hind femora dark brown, remainder of legs light red-brown; gaster red-brown, lateral margins of terga II, III, IV with black patches.

Pubescence. Head sparsely covered with short, minutely branched hair, a few long hair along anterior margin of clypeus; scutum and scutellum sparsely covered with short, erect, branched hair, a few long hair along posterior margin of scutellum; propodeum bare dorsally, vertically with erect, branched hair; gastral terga I, II almost bare, terga III, IV and V with increasing density of short, simple hair.

Male. BL c. 4.1 mm; FL c. 3.2 mm; head wider than long (50:44); eyes converging below, UID:LID as 31:24; scape not reaching level of median ocellus; Fg:UID as 2.4:1. AOD:IAD:OAD:IOD:OOD as 7:6:15:9:8. Clypeus concave anteromesially; BP complete.

Sculpturing. Frons coarsely reticulate; supraclypeal area and clypeus smooth and shining, sparsely punctured; scutum finely reticulate anteriorly, remainder smooth and shining, basal two thirds openly punctured; scutellum smooth and shining, a few pilifcrous punctures; dorsal surface of propodeum with several longitudinal rugae, none reaching rim.

Colour. Head (except antennae), scutum, scutellum and propodeum black, basal one third of scape light red-brown, remainder brown, flagellum light brown; pronotal tubercle light red-brown; fore tibiae, tarsi and mid coxae light red-brown, remainder of legs light brown; gaster red-brown.

Pubescence. Frons on anterior half, lower paraocular areas, supraclypeal area and clypeus with short, plumose, adpressed hair, basal half of frons, vertex and genae with short, simple hair; vertical surface of propodeum with a few short, erect, branched hairs; gastral tergum I almost bare, remainder of terga sparsely covered with short, simple hair; gastral sterna with a few long, branched hairs on lateral posterior margins.

Genitalia. Figs. 16d, e, f.

Gastral Sternum VI. Fig. 25e.

Remarks. The species is named after Dr T.F. Houston who has contributed greatly to the systematic knowledge of Apoidea in Australia and has collected many of the specimens used in this study.

Distribution. Southern Western Australia (Fig. 3a).

Homalictus imitatus sp. nov.

Figures 2b; 15g-i; 25c

Material examined.

Holotype ♂, Prairie Homestead Turnoff, 86 km NNE. of Thargomindah, Queensland, 20 Nov 1979, K.L. Walker, on *Eucalyptus populnea* (QM).

Paratypes 6 ♂♂: 2 ♀♀, same as holotype; 1♂, Charleville, Queensland, 23 Nov 1979, K.L. Walker, on *Eucalyptus cunaldulensis*; 1♂, Basalt Ck, 4 km E. of Mitchell, Queensland, 23 Nov 1979, on *Eucalyptus populnea*; 1♂, 48 km N. of Windorah, Queensland, 17 Oct 1968, G. Monteith; 1♂, Blackall, Queensland, 28 Oct 1968, E.M. Exley, on *Amyema miquelii* (all UQIC).

Other specimens examined: (44 ♀♀) (PD: 10-11) (FR: *Amyema*, *Eucalyptus*) QUEENSLAND: Toobeah, St. George, Bollon, Cunnamulla, Thargomindah, Quilpie, Cheepie, Charleville, Mitchell, Roma, Condamine, Miles, Glenmorgan, Blackall, Longreach, Windorah (UQIC).

Diagnosis. A member of the '*dotatus*' species-group, almost identical to *H. dotatus*; male distinguished from other members of the genus by the following combination of characters: BP complete; clypeus with some pale yellow colour; frons, paraocular areas and supraclypeal area covered with short, adpressed hair; scutum openly punctured; genitalia with apical processes of gonocoxite large and broad (Fig. 15g-i).

Male. BL 4.2-4.6 mm (holotype c. 4.6 mm); FL 3.3-3.5 mm (holotype c. 3.5 mm); head wider than long (48:41); eyes converging below, UID:LID as 28:24; scape not reaching level of median ocellus; Fg:UID as 3.0:1. AOD:IAD:OAD:IOD:OOD as 7:7:14:9:6. BP complete, apically rounded.

Sculpturing. Head covered with thick hair but appears to be reticulate, except clypeus and supraclypeal area smooth and openly punctured; scutum reticulate, impunctate anteriorly, remainder smooth and openly punctured; scutellum with few sparse punctures, smooth and shining; dorsal surface of propodeum with a few rugulae posteromesially, weak parallel rugulae laterally.

Colour. Frons, vertex, genae, supraclypeal area and basal half of clypeus dark green, remainder of clypeus pale yellow; scape and flagellum red-brown; pronotal tubercle pale yellow; scutum dark green; scutellum and propodeum black tinged with dark green; fore and hind coxae dark green, mid coxae and all legs light red-brown; gaster light red brown.

Pubescence. Frons, supraclypeal area and basal one third of clypeus with short, plumose, adpressed hair, paraocular areas covered with similar hair; genae with erect, branched hair; anterior one third and posterior margin of scutum with short, plumose, adpressed hair, remainder with short, simple, backwardly directed hair, each side of scutum hair forming a 'whorl' pattern near posterior end of parapsidal lines; scutellum almost bare, with a few long, branched hair; metanotum with short, plumose, adpressed hair.

Genitalia. Figs. 15g, h, i.

Gastral Sternum VI. Fig. 25c.

Remarks. *H. imitatus* was accidently discovered while preparing a series of *H. dotatus* male genitalia. Present data indicates that it occurs sympatrically with *H. dotatus* and is found only in southern Queensland.

Specific identification is by genitalia only, as the external morphology appears to be identical to *H. dotatus*. Initially a hair pattern on the scutum and scutellum was considered diagnostic; however, subsequent examination, in conjunction with male genitalia preparations, proved the pattern may or may not be present in *H. imitatus* while it was never present in *H. dotatus*.

Distribution. Southern Queensland (Fig. 2b).

Homalictus latitarsis (Friese)

Figures 3b; 12g; 20a-c; 26g

Halictus latitarsis Friese, 1909: 188.–Blüthgen, 1926: 470-473.

Halictus mcgregori Cockerell, 1919b: 277. syn. by Blüthgen, 1926: 470.

Homalictus latitarsis.–Michener, 1965: 180.

Type material.

Lectotype ♂ of *Halictus latitarsis*, New Guinea: von Friedrich-Wilhemshafen, 1901, Biro (HNHM), Paralectotypes 2 ♀♀, 'auf *Cordyline* Blüthen', Biro (HNHM, MZUS) (not examined). Lectotype and Paralectotypes designated by Pauly (in press)

Holotype ♀ of *Halictus mcgregori*, Panay, Antique Prov., Culasi, 3 Jun 1918, McGregor (USNM) (not examined).

Other specimens examined: (6 ♂♂) (PD: 11) (FR: *Tristaniopsis*) QUEENSLAND: Peaches Crossing via Coen (UQIC).

Diagnosis. A member of the '*blackburni*' species-group, most like *H. grossopedalus*; male distinguished from other members of the genus by the following combination of characters: clypeus with pale yellow on basal half; genae with long, branched hair (forming a

beard); fore tarsal segments (only) flanged laterally.

Male. BL 5.6-5.9 mm; FL 3.9-4.2 mm; head wider than long (56:50); eyes converging strongly below, UID:LID as 32:21; clypeus slightly convex, width twice length (22:11); antennal sockets separated by distance equal to diameter of socket; antennal scape short, reaching to three quarters to median ocellus; Fg:UID as 2.3:1. AOD:IAD:OAD:IOD:OOD as 7:5:18:10:8. Fore tarsal segments expanded laterally (cf. Fig. 5j); BP complete and apically rounded.

Sculpturing. Head smooth, frons finely tessellate, supraclypeal area reticulate, clypeus polished, though finely reticulate; frons and supraclypeal area impunctate, clypeus openly punctured with shallow hair pits; scutum and scutellum dull, covered with fine lineolets, producing a circular pattern on each scutal half, and entirely on scutellum, both sparsely punctured with minute piliferous punctures; dorsal surface of propodeum (Fig. 12g) mesially with branched rugae extending half way to rim, laterally coarsely reticulate.

Colour. Frons, vertex, supraclypeal area, mesosoma black; basal half of clypeus brown-black, remainder pale-yellow; antennae dark brown; pronotal tubercle brown; coxae, trochanters, femora and tibia dark brown, mid tibiae dark brown suffused with red-brown; tarsi and fore tibiae light red-brown; fore tarsal segments dull white mesially; gaster black with a blue sheen.

Pubescence. Frons with both short, branched and simple hair; vertex with erect, minutely branched hair; lower paraocular areas with short, plumose, adpressed hair; clypeus, supraclypeal area and basal two thirds of mandibles with a few erect, branched hairs; genae with long, branched hair (forming a beard); scutum and scutellum sparsely covered with short, erect, simple hair; metanotum with a few long, erect, branched hairs; propodeum with erect, plumose hair dorsolaterally and vertical surfaces; legs with long, plumose hair on coxae, trochanters, fore and hind femora and fore tarsi, similar hair on ventral surface of mesosoma; gaster sparsely covered with short, simple and branched hair.

Genitalia. Figs. 20a, b, c.
Gastral Sternum VI. Fig. 26g.

Remarks. This is the first record of *H. latitarsis* in Australia. Identification was confirmed by Dr A. Pauly who has examined and designated the lectotype.

Only males of the species were taken.

Dr A. Pauly (pers. comm.) provided the following distributional data for the species outside of Australia:

BISMARK ARCHIPELAGO: Hermit Is., Luf.

NEW GUINEA: Bubia.

PHILIPPINES: PALAMAN: Mentalingajan, Pinigisan. BALABAC: Calawan. LUZON: Mt Maquiling. MINDANAO: Momungan.

INDONESIA: SUMATRA: Fort de Kock. KALIMANTAN: Ranau.

Distribution. Cape York Peninsula, Queensland (Fig. 3b).

Homalictus luteoaeneus (Friese)

Figures 6h; 9h; 11h

Halictus luteoaeneus Friese, 1924: 236.–Cockerell, 1929a: 14.–1933: 315.

Homalictus luteoaeneus.–Michener, 1965: 180.

Material examined.

Lectotype ♀, Victoria, von Müller (AMNH). Species described from several syntypes but only one was located. Lectotype designated here. Type in poor condition.

Lectotype. BL c. 7.2 mm; FL c. 4.8 mm; head wider than long (79:68); UID:LID as 33:30; clypeus slightly greater than twice as wide as long (35:16), convex, protruded; antennal sockets separated by distance equal to diameter of socket; supraclypeal area bulbous. AOD:IAD:OAD:IOD:OOD as 15:10:25:12:10. Scape reaching basal margin of median ocellus; dorsolateral angle of pronotum produced into small blunt tubercle; dorsal surface of propodeum slightly shorter than scutellum, defined by carinae; TS with three blunt teeth, basal two long, apical tooth short and shorter than outer spur; BP complete, apically rounded.

Sculpturing. Head roughened, frons (Fig. 6h) with vertical striae, continuing around eye,

except medianly above antennal bases granulate; clypeus shining, finely reticulate, openly punctured; scutum (Fig. 9h) finely reticulate, anteriorly with weak transverse plicae, directed obliquely near midline but not reaching midline, area between parapsidal lines sparsely punctured, parapsidal areas openly punctured, hind margin closely punctured; scutellum smooth, sparsely punctured; dorsal surface of propodeum (Fig. 11h) with rugae extending mesially to carina, posterior lateral areas with weak rugulae.

Colour. Frons, vertex and genae dark green, suffused with golden tinge; clypeus and supraclypeal area green suffused with red; basal half of scape light red-brown, remainder dark brown; flagellum dark brown; mandibles light brown, red apically, black basally; scutum and scutellum dark green, hind margin of former suffused with coppery red; propodeum black; coxae and trochanters dark brown; basal two thirds of fore femora and basal two thirds of anterior surface of mid and hind femora brown, remainder of femora; tibiae and tarsi light red-brown; gaster dark green, anterior margin of terga with dark brown.

Pubescence. (much of the hair has been removed from the type). Head sparsely covered with short, white hair; scutum sparsely covered with short, branched hair; terga I and II bare, terga III, IV and V with increasing density of hair, more so laterally.

Remarks. Apart from the type, no other specimens are known. This species may prove to be a synonym of *H. caloundrensis* but has not been synonymised as the scutal characteristics do not fall within the variations observed for *H. caloundrensis*. The species is redescribed to assist future identifications.

Distribution. Victoria (?).

Homalictus maitlandi (Cockerell)

Figures 3b; 7j; 10c; 12c

Halictus maitlandi Cockerell, 1910: 233.–1933: 315.
Homalictus maitlandi.–Michener, 1965: 180, 338.

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

Other specimens examined: (6 ♀♀) (PD: 3) QUEENSLAND: Kuranda (BMNH, NMV).

Diagnosis. A member of the '*blackburni*' species-group, most like *H. blackburni*; female distinguished from other members of the genus by the following unique character: short, golden hair across gastral terga II and III and on lateral margins of tergum VI.

Female. BL 6.0-7.0 mm (holotype c. 6.8 mm); FL 4.6-5.3 mm (holotype c. 5.2 mm); head wider than long (76:70); eyes converging below, UID:LID as 42:34; clypeus convex, width at least twice length (36:16); antennal sockets separated by distance less than diameter of socket; supraclypeal area bulbous. AOD:IAD:OAD:IOD:OOD as 15:5:26:9:12. Scape reaching posterior margin of median ocellus; dorsolateral angles of pronotum projecting as a large, rounded tubercle; fore basitarsal comb absent; BP complete, apically bluntly acute; TS with three rounded teeth, proximal two large, distal tooth minute, TS slightly smaller than outer spur.

Sculpturing. Head smooth (Fig. 7j), finely reticulate, impunctate; scutum (Fig. 10c) and scutellum finely reticulate, impunctate; dorsal surface of propodeum (Fig. 12c) mesially with interconnecting longitudinal rugulae almost reaching dorsal rim. Colour. Head (except antennae), mesosoma (except pronotal tubercle dull white), gaster black; antennal scapes red-brown, flagellum black to dark brown; coxae, trochanters, femora black, tibiae and tarsi red-brown.

Pubescence. Head sparsely covered with short, minutely branched hair, anterior margin of clypeus with long, simple hair; scutum almost bare, a few short, erect, simple hairs, except anterior lateral corners covered with dense, short, plumose, golden hair; anterior lateral areas of mesopleuron (beneath tegulae) with plumose, golden hair; scutellum with a few long, branched hairs along posterior margin; metanotum and lateral margins of dorsal surface of propodeum covered with short, plumose, golden hair; gastral terga II, III and lateral margins of tergum IV with short, plumose, golden hair across terga.

Remarks. Turner seems to have had a number of 'Cairns' labels printed and used them for the surrounding districts. He wrote in the exact locality beneath the printed word 'Cairns'. The correct type locality of *H. maitlandi* is Kuranda, not Cairns.

H. maitlandi is the only species in the genus to have apparent basal bands of white tomentum on gastral terga II and III. Michener (1965: 338) explained that the bands of hair were not homologous with a normal tomentum as they arose from the gradular fringe rather than the general tergal surface.

Male unknown.

Distribution. North Queensland (Fig. 3b).

Homalictus megastigmus (Cockerell)

Figures 3a; 7e; 9q; 11q; 17d-f; 25h

Halictus megastigmus Cockerell, 1926a: 219.–1933: 315.
Halictus dixoni Rayment, 1935: 703. syn. nov.
Halictus tarltoni hentyi Rayment, 1953: 27. fig. 3 (nos. 3 & 6). syn. nov.
Halictus sevillensis Rayment, 1953: 27, fig. 3 (nos. 2 & 8). syn. nov.
Homalictus megastigmus.–Michener, 1965: 180.
Homalictus dixoni.–Michener, 1965: 180.
Homalictus hentyi.–Michener, 1965: 180.
Homalictus sevillensis.–Michener, 1965: 181.

Material examined.
Holotype ♀ of *Halictus megastigmus*, Hobart, Tasmania, 22 Jan 1918/55, C.E. Cole (NMV).
Holotype ♀ of *Halictus dixoni*, Ferntree Gully, Victoria, 1932, J.E. Dixon (ANIC). Type incorrectly referred to as male in original description.
Holotype ♀ of *Halictus tarltoni hentyi*, Gorae West, Victoria, 26 Sep 1952, T. Rayment (ANIC).
Holotype ♀ of *Halictus sevillensis*, Seville, Victoria, 20 Sep 1928, T. Rayment (ANIC).
Other specimens examined: (74 ♀♀, 4 ♂♂) (PD: 1-4,9-12) (FR: *Leucopogon, Acacia, Eremophila, Calytrix, Eucalyptus, Leptospermum, Bursaria, Lasiopetalum, Tetratheca*) QUEENSLAND: Cooloola (QM). NEW SOUTH WALES: Ebor, Coffs Harbour (UQIC); Sydney (QM); Bathurst, Brown Mtn, Bungendore, Monga (ANIC). VICTORIA: Kallista, Lower Tarwin, Erica, Ferntree Gully, Frankston, Sandringham, Cape Bridgewater, Reefton, Tambo Crossing, Blackwood (NMV). TASMANIA: Hobart, Ridgeway, St Helens (SAM); Pioneer (ANIC). SOUTH AUSTRALIA: Warren Nat. Pk, Kingscote, Bray Junction, Coorong, Adelaide, Kangaroo Is., Ravine-de-Casoars (SAM). WESTERN AUSTRALIA: Busselton, Porongurup, Walpole, Denmark, Northcliffe (ANIC).

Diagnosis. A member of the *'sphecodoides'* species-group; distinguished from other members of the genus by the following combination of characters: Female–clypeal width greater than three times the length; frons almost smooth; scutum sparsely punctured except openly punctured along posterior margin. Male–Fg:UID c. 2.3:1; UID:LID c. 1.1:1; clypeus without yellow or white markings; head densely covered with short, plumose hair.

Female. BL 4.7-6.2 mm (holotype c. 6.2 mm); FL 3.7-4.9 mm (holotype c. 4.9 mm); head wider than long (68:54); UID:LID as 39:39; clypeus width greater than three times length, (38:11); antennal sockets separated by distance equal to diameter of socket. AOD:IAD:OAD:IOD:OOD distances as 15:5:23:11:11. Scape reaching posterior margin of median ocellus; dorsolateral angle of pronotum projecting as small rounded tubercle; TS with six small, blunt teeth and slightly smaller than outer spur; BP complete, apically rounded.

Sculpturing. Head smooth (Fig. 7e), frons with a few weak vertical striae above antennal bases, clypeus and supraclypeal area finely reticulate; clypeus open-sparsely punctured, supraclypeal area bulbous, with a few punctures; scutum smooth (Fig. 9q), tessellate and punctured, sparsely punctured except posterior margin openly punctured; scutellum polished and shining, minutely openly punctured; propodeum finely reticulate, dorsal surface (Fig. 11q) with parallel rugae, mesially to at least anterior half, laterally to rim.

Colour. Head, antennae, scutellum and propodeum black, scutum waxy, dark blue-black; apical one third of femora, tibiae and tarsi light red-brown, remainder of legs black; gaster red-brown, suffused with brown apically.

Pubescence. Head, scutum and scutellum sparsely covered with short, erect, minutely branched hair, scutellum with long, erect, branched hair along posterior margin; metanotum with short, plumose hair mediad;

vertical surface of propodeum with erect, branched hair; gastral terga smooth and shining, terga I and II almost bare, a few hair on terga III and IV, tergum V with short, branched hair.

Male. BL 4.3-4.7 mm; FL 3.6-3.9 mm; head wider than long (58:47); eyes converging slightly below, UID:LID as 36:32; scape reaching level of median ocellus; Fg:UID as 2.3:1. AOD:IAD:OAD:IOD:OOD as 11:7:17:10:11. BP complete, apically pointed.

Sculpturing. Head finely reticulate, clypeus open-sparsely punctured; scutum with anterior one third reticulate, remainder of scutum and scutellum polished and shining; scutum sparsely punctured, scutellum with a few minute, piliferous punctures; dorsal surface of propodeum weakly areolate with rugulae medianly, laterally with parallel rugulae not reaching rim.

Colour. Head, mesosoma black; coxae, trochanters, basal half of femora dark brown, remainder of legs light red-brown; gastral tergum I dark brown, with anterior one third light red-brown, terga II and III light red-brown, remainder of terga dark brown.

Pubescence. Frons with both long, branched hair and short, simple hair; lower paraocular areas, supraclypeal area and clypeus with short, plumose, adpressed hair (not a complete cover); scutum and scutellum with long, erect branched hair; vertical surface of propodeum with erect, branched hair; gastral sterna II and III with transverse rows of erect, branched hair, remainder of sterna sparsley covered with hair.

Genitalia. Figs. 17d, e, f.

Gastral Sternum VI. Fig. 25h.

Remarks. Intraspecific colour variation is minimal except females from south west Western Australia have the apical one third of the fore femora, tibiae and tarsi are light red-brown and the remainder of the legs are dark brown.

Distribution. South-east Queensland, New South Wales, Victoria, Tasmania, South Australia and south-east Western Australia (Fig. 3a).

Homalictus multicavus sp. nov.

Figures 4a; 8g; 10m; 12n; 22d-f; 27e

Material examined.

Holotype ♀ (QM), Paratypes 2 ♀♀ (UQIC), Melvor R. crossing, 40 km N. of Cooktown, 15-18 Jul 1976, G.B. and S.R. Monteith

Other specimens examined: (7 ♀♀, 2 ♂♂) (PD: 8,11) (FR: *Eucalyptus*, *Thryptomene*) QUEENSLAND: Finch Bay (QDPI); Cooktown (QDPI, UQIC), Port Douglas (UQIC, SAM); Mt Webb (♂♂, ANIC).

Diagnosis. A member of the '*urbanus*' species-group, most like *H. murrayi*; distinguished from other members of the genus by the following combination of characters: Female–labrum with two raised tubercles; dorsal surface of propodeum defined posteriorly only by a carina; BP complete; scutum densely punctured except anteriorly (Fig. 10m). Male–Fg:UID <2.0:1; EW:GW < 2.5:1; gastral tergum impunctate; scutum densely punctured in parapsidal areas.

Female. BL 5.7-6.3 mm (holotype c. 5.9 mm); FL 3.8-4.2 mm (holotype c. 4.0 mm); head wider than long (71:56); UID:LID as 41:36; clypeus more than twice as wide as long (32:14), gently convex, protruded; antennal sockets separated by distance greater than socket; supraclypeal area raised, but not bulbous. AOD:IAD:OAD:IOD:OOD as 14:7:24:12:10. Scape reaching anterior margin of median ocellus; EW:GW as 2.0:1; dorsolateral angle of pronotum projecting as small acute spine; dorsal surface of propodeum as long as scutellum, defined posteriorly only by a carina; TS with two small teeth and about half as long as outer spur; BP complete, bluntly angulate apically.

Sculpturing. Head roughened, frons (Fig. 8g), except medianly (granular), with vertical striae, continuing around eyes, weak transverse striae beneath ocelli and areas along inner margins of eyes finely reticulate; clypeus smooth finely reticulate on basal half, open-sparsely punctured; supraclypeal area finely reticulate, sparsely punctured; scutum (Fig. 10m) dull, anteromesially impunctate, a few transverse weak plicae, anterolaterally with areolate rugae, remainder densely punctured,

finely reticulate between punctures; dorsal surface of propodeum (Fig. 12n) with areolate rugae, extending posteriorly to carina and laterally onto vertical surface.

Colour. Frons and supraclypeal area olive green; clypeus with anterior half black, posterior half golden dark green, suffused with red; vertex, genae and propodeum dark blue; scape black, flagellum black except light red-brown apically beneath; scutum and scutellum dull blue-green with golden tinges laterally; legs black; gaster steel-blue with purple tinges.

Pubescence. Head, scutum and scutellum sparsely covered with short, branched hair; vertical posterior surface of propodeum sparsely covered with erect, minutely branched hair; gastral terga I-IV almost bare, tergum V with short hair.

Male. BL 4.6-5.3 mm; FL 3.2-3.6 mm; head wider than long (63:52); eyes converging below, UID:LID as 36:26; scape not reaching level of median ocellus; Fg:UID as 1.7:1; EW:GW as 2.2:1. AOD:IAD:OAD:IOD:OOD as 8:8:19:12:8. BP complete, bluntly angulate apically.

Sculpturing. Head roughened, frons, except medianly (granular), with weak vertical striae to level short of median ocellus, below median ocellus fine transverse striae continuing around behind eyes; vertex with several transverse strong striae continuing around onto genae; clypeus and supraclypeal area reticulate, openly punctured; scutum reticulate, coarsely so anteriorly, anterior one fifth impunctate, with weak transverse plicae (strong in anterior lateral corners), remainder closely punctured, except in parapsidal areas densely punctured; scutellum reticulate, openly punctured, except along midline densely punctured; dorsal surface of propodeum not defined by carina, with areolate rugae extending onto vertical surface.

Colour. Frons to level of vertical striae green tinged with gold, transverse lineolation area on frons, vertex and genae blue; clypeus and supraclypeal area dark green; scutum and scutellum golden green; metanotum dark blue; propodeum dark green; coxae, trochanters, femora (except apical rim red-brown) dark green, fore tibiae and all tarsi red-brown, mid and hind tibiae red-brown suffused mesially with dark brown; gaster black, tinged with dark green, except tergum VII red-brown.

Pubescence. Frons, vertex, genae and supraclypeal area with erect, branched hair; lower paraocular areas, laterally on clypeus with short, apicad directed, plumose hair, clypeus mesially with short, branched hair; basal one third of mandibles with short, erect, branched hair; scutum and scutellum sparsely covered with short, erect, minutely branched hair; metanotum with a few long, erect, branched hairs; vertical surface of propodeum with short, erect, simple hairs; sterna II, III, IV, and V with cover of long, apicad directed, minutely branched hair.

Genitalia. Figs. 22d, e, f.

Gastral Sternum VI. Fig. 27e.

Distribution. North Queensland (Fig. 3a).

Homalictus murrayi (Cockerell)

Figures 4a; 8h; 10n; 12o; 22g-i; 27f

Halictus murrayi Cockerell, 1905c: 272.–1929b: 2.–1930a: 151-2.–1933: 316.

Homalictus murrayi.–Michener, 1965: 180.

Material examined.

Holotype ♀, Adelaide River, Northern Territory, J.J. Walker, 5138 (BMNH).

Other specimens examined: (136 ♀♀, 16 ♂♂) (PD: 5-8,10-12) (FR: *Terminalia, Anigozanthos, Eremophila, Eucalyptus, Tristanopsis, Bursaria, Borreria, Atalaya, Xanthorrhoea*) QUEENSLAND: Brisbane, Peregian, Morven, Cairns (SAM); Stradbroke Is., Tibrogargan Ck, Torbul Pt, Caloundra, Tin Can Bay, Bingil Bay, Yarraman, Beerwah, Mt Pleasant, Clermont, Telegraph Line Crossing Jardine R., St Pauls, Moa (Banks) Is. (UQIC); Chillagoe, Evelyn, Bamaga (QDPI); Kuranda, Gordonvale, Mossman, Mareeba, Hope Vale Mission (ANIC). NORTHERN TERRITORY: Melville Is. (SAM); Elliot, Dunmarra, Daly Waters, Borroloola Rd at Junction of Stuart Hwy, Borroloola, Katherine (UQIC); Mt Cahill, Koongarra, Nourlangie Ck, Jaja Lagoon, Mt Brockman, Nimbuwah Rock (ANIC). WESTERN AUSTRALIA: Broome (UQIC); Mitchell Plateau, Lone Dingo (ANIC). SOUTH AUSTRALIA: Cradock, Lake Gilles Nat. Pk (SAM).

Diagnosis. A member of the '*urbanus*' species-group, most like *H. multicavus*; distinguished from other members of the genus by the following combination of characters: Female–

labrum with two raised tubercles; frons with vertical striae; gastral tergum I mesially with minute punctures; vertical posterior surface of propodeum covered with short, minutely branched hair. Male–Fg:UID <2.0:1; gastral tergum I with minute punctures mesially; scutum closely punctured in parapsidal areas; scutellum sparsely punctured, about same length as dorsal surface of propodeum.

Female. BL 4.7-5.2 mm (holotype c. 4.7 mm); FL 3.3-3.5 mm (holotype c. 3.4 mm); head wider than long (60:50); eyes converging below, UID:LID as 35:29; clypeus convex, width about twice length (25:12); antennal sockets separated by distance less than diameter of socket. AOD:IAD:OAD:IOD:OOD as 14:4:20:10:9. Scape extending to level of anterior margin of median ocellus; EW:GW as 1.7:1; TS with three teeth, proximal two teeth large, distal tooth small and about half length of outer spur; BP complete, bluntly angulate apically.

Sculpturing. Head roughened (Fig. 8h), frons with vertical striae to level of anterior margin of median ocellus; vertex with several weak transverse striae extending onto genae; clypeus on basal half and supraclypeal area finely reticulate, sparsely pitted, anterior half of clypeus smooth and polished with several large punctures; scutum and scutellum reticulate, scutum (Fig. 10n) impunctate anteriorly, densely punctured in parapsidal areas and along posterior margin, mesially openly punctured, scutellum sparsely punctured, except along anterior margin and midline openly punctured; dorsal surface of propodeum (Fig. 12o) with branched rugae extending laterally onto vertical surface mesially to rim; gastral tergum I with median area of minute punctures.

Colour. Frons and paraocular areas blue; supraclypeal area dark green or grey; basal half of clypeus grey-blue or dark green sometimes tinged with transverse bands of gold, purple and blue, anterior half dark brown to black; scape and flagellum above black, flagellum beneath light brown; scutum and scutellum royal blue suffused with purple or blue-green suffused with gold; propodeum dark blue to black; coxae, trochanters and femora black to dark brown, remainder brown, except apical margins of fore tibiae red-brown; gaster black.

Pubescence. Head sparsely covered with short, erect, minutely branched hair, except genae with erect, branched hair and a few long, simple hairs along anterior margin of clypeus; scutum and scutellum with both short, erect, minutely branched and short, simple, apical directed hair, a few long, erect, branched hairs along posterior margin of scutellum; propodeum bare dorsally, vertical posterior surface sparsely covered with erect, minutely branched hair; gastral terga with short, simple inclined hair.

Male. BL 4.2-5.0 mm; FL 3.0-3.4 mm; head wider than long (61:50); eyes converging below, UID:LID as 35:24; scape extending almost to level of anterior margin of median ocellus; Fg:UID as 1.7:1; EW:GW as 2.5:1. AOD:IAD:OAD:IOD:OOD as 10:5:18:11:9. BP complete, apically rounded; scutellum about same length as dorsal surface of propodeum; TS with four minute, narrow teeth and two thirds length of outer spur.

Sculpturing. Frons reticulate (a few faint vertical striae); vertex with several transverse striae, barely extending onto genae; clypeus and supraclypeal area finely reticulate, impunctate; scutum and scutellum reticulate, scutum impunctate anteriorly, remainder with indistinct sparse punctures, except mesially posterior margin openly punctured; scutellum sparsely punctured except along midline closely punctured; dorsal surface of propodeum with branching rugae anteromesially only, remainder with longitudinal rugae extending to rim; gastral tergum I with minute punctures mesially.

Colour. Head, scutum and scutellum brass-green, except vertex tinged with blue and anterior half of clypeus black; metanotum and propodeum dark blue; coxae, trochanters and femora dark brown to black, fore tibiae and tarsi light red-brown, mid and hind tibiae and tarsi brown sometimes suffused with light red-brown; gaster dark brown to black.

Pubescence. Frons with short, erect, simple hair; lower paraocular areas, clypeus, supraclypeal area, vertex and genae with short, apicad inclined branched hair; scutum and scutellum with both erect, minutely branched and short, simple hair; posterior margin of scutellum and metanotum with a few long, branched hairs; propodeum bare dorsally, vertical posterior surface sparsely covered with erect, minutely branched hair; gastral tergum I almost bare, a few short, simple hairs mesially, remaining terga with increasing density of short, simple hair.

Genitalia. Figs 22g, h, i.
Gastral Sternum VI. Fig. 27f.

Distribution. Across northern Australia, two specimens from South Australia (Fig. 4a).

Homalictus niveifrons (Cockerell)

Figures 3a; 7d; 9p; 11p; 17a-e; 25g

Halictus niveifrons Cockerell, 1914a: 520.–1933: 317.–Rayment, 1953: 24.

Halictus oxoniellus Cockerell, 1914b: 369.–1933: 317. syn. nov.

Halictus mesocyaneus Cockerell, 1922a: 264.–1933: 316. syn. nov.

Halictus raymenti Cockerell, 1926b: 247.–1933: 319. Rayment, 1931a: 168.–1931b: 252-255, pl. 1, blks. 1 & 3.–1935: 238, 241, 698, pls. 36, 40.–1953: 23, fig. 4. syn. nov.

Halictus tarltoni Cockerell, 1927: 101.–1933: 322.–Rayment, 1931a: 168.–1935: 290-2, pls. 36, 40.–1953: 24, figs. 1, 7. syn. nov.

Halictus aureo-azureus Rayment, 1935: 697, pl. 40. syn. nov.

Halictus littoralis Rayment, 1935: 700, pl. 40 (not Blüthgen, 1923: 248).–1953: 24. syn. nov.

Homalictus niveifrons.–Michener, 1965: 180.

Homalictus oxoniellus.–Michener, 1965: 180.

Homalictus mesocyaneus.–Michener, 1965: 180.

Homalictus raymenti.–Michener, 1965: 181.

Homalictus tarltoni.–Michener, 1965: 181.

Homalictus aureoazureus.–Michener, 1965: 179.

Homalictus littoralis (Rayment not Blüthgen).–Michener, 1965: 180.

Material examined.

Lectotype ♂ of *Halictus niveifrons*, Tasmania, Lea (BMNH). Two male syntypes are glued to a card with a 'type' label below in Cockerell's handwriting. The specimens to the left of the pin is headless, the specimen to the right is complete although the abdomen has come loose and been glued to the card beneath the rest of the body. The second specimen (to the right of the pin) is the Lectotype and I have marked the letter 'L' beneath the specimen.

Holotype ♀ of *Halictus oxoniellus*, Bribie Is., 2 Nov 1913, Queensland, H. Hacker (QM).

Holotype ♀ of *Halictus mesocyaneus*, Bribie Is., Queensland 1 Apr 1918, H. Hacker (QM).

Holotype ♀ of *Halictus raymenti*, Sandringham, Victoria 1926, T. Rayment (USNM).

Holotype ♀ of *Halictus tarltoni*, Brighton, Victoria 20 Sep 1926, T. Rayment, at flowers of *Osteospermum moniliferum* (USNM).

Holotype ♀ of *Halictus aureo-azureus*, Sandringham, Victoria, 16 Dec 1926, T. Rayment (ANIC).

Holotype ♀ of *Halictus littoralis*, (Rayment not Blüthgen) Sandringham, Port Phillip, Victoria, 21 Oct 1926, T. Rayment (ANIC). Michener (1965) incorrectly retained *littoralis* as a valid specific name when reassigning it to *Homalictus*. The name is a primary junior homonym of *Halictus littoralis* Blüthgen, 1923. No new name is required as it is a new synonym of *Homalictus niveifrons*.

Other specimens examined: (87 ♀♀, 50 ♂♂) (PD: 1-5,8-12) (FR: *Osteospermum, Hibbertia, Melaleuca, Boronia*) QUEENSLAND: Fraser Is., Binna Burra (UQIC); Peregian (SAM). NEW SOUTH WALES: Brunswick Heads, Lennox Head (UQIC); Chatswood, Moruya (ANIC). VICTORIA: Anglesea, Ringwood, Mt Evelyn, Dunkheld (NMV); Sandringham, Blacombe Hts, Gorae West (NMV, ANIC); Port Phillip, Seaford (SAM). TASMANIA: Devonport (SAM); Eaglehawk Neck (BMNH). SOUTH AUSTRALIA: Adelaide, Kangaroo Is., West Beach (SAM).

Diagnosis. A member of the '*sphecodoides*' species-group, most like *H. pectinalus*; distinguished from other members of the genus by the following combination of characters: Female–head and propodeum black; frons smooth, a few weak vertical striae below ocelli (Fig. 7d); clypeal width less than three times length; scutum appears impunctate, a few weak sparse punctures (Fig. 9p). Male–Fg:UID <2.0:1; UID:LID >1.3:1; clypeus without yellow or white markings; frons reticulate; head and scutum black.

Female. BL 5.1-5.6 mm; FL 4.0-4.4 mm; head wider than long (61:55); UID:LID as 35:33; clypeal width less than three times length (28:12); antennal sockets separated by distance less than diameter of socket. AOD:IAD:OAD:IOD:OOD as 12:6:20:11:10. Scape reaching posterior margin of median ocellus; dorsolateral angle of pronotum barely projecting as a small rounded tubercle; TS with four small, blunt teeth and half the length of outer spur; BP complete, apically pointed.

Sculpturing. Head smooth, frons (Fig. 7d) finely tessellate and with weak vertical microridges extending from above antennal bases to below level of median ocellus; basal two thirds of clypeus, supraclypeal area and vertex finely reticulate, impunctate, anterior one third of clypeus smooth, a few broad, shallow depressions; scutum (Fig. 9p) finely reticulate, appearing impunctate, though with a few small, sparse punctures; scutellum smooth and shining mesially reticulate on perimeter, punctured with minute sparse punctures; propodeum dull, finely reticulate, dorsal surface (Fig. 11p) with rugulae mesially on anterior half only, reaching rim laterally.

Colour. Vertex, frons, supraclypeal area, scutellum and propodeum black; clypeus black tinged with blue and red; scutum blue (Queensland specimens) or green (southern Australian specimens); legs black; gaster smooth and shining variable from orange red-brown with dark brown-black pigmentation on tergum I and lateral margins of terga to dark brown suffused with light brown patches.

Pubescence. Frons, paraocular areas, vertex and genae sparsely covered with erect, branched hair; clypeus and supraclypeal area with short, simple hair, some long, simple hairs on anterior margin of clypeus; scutum sparsely covered with erect, branched hair; metanotum with some short, plumose hair mediad; propodeum bare dorsally except few long branched hair on extreme lateral margins, similar erect hair on vertical surface; gastral terga with sparse short, simple hair, terga IV and V increasing density.

Male. BL 4.0-5.0 mm (leetotype c. 4.5 mm); FL 2.8-3.6 mm (leetotype c. 3.2 mm); head wider than long (58:52); eyes strongly converging below, UID:LID as 35:26; scape reaching anterior margin of median ocellus; Fg:UID as 1.8:1. AOD:IAD:OAD:IOD:OOD as 8:8:18:10:10. BP complete, apical pointed.

Sculpturing. Head coarsely reticulate, clypeus and supraclypeal area impunctate; scutum reticulate, more coarsely so anteriorly, openly punctured; scutellum shining, with minute sparse punctures; dorsal surface of propodeum reticulate with parallel rugulae extending on anterior half only mesially, to rim laterally.

Colour. Body and legs black, anterior margins of terga suffused with dark brown.

Pubescence. Frons, paraocular areas, supraclypeal area and clypeus covered with short, plumose, adpressed hair; vertex, between rear ocelli and genae with long, erect, branched hair; scutum, scutellum and vertical surface of propodeum sparsely covered with erect, branched hair; gastral sterna with inwardly directed long, branched hair.

Genitalia. Figs. 17a, b, c.

Gastral Sternum VI. Fig. 25g.

Remarks. Rayment (1935, 1953) commented on the close relationships between *Halictus niveifrons, H. raymenti, H. tarltoni, H. aureoazureus* and *H. littoralis* and stated (1953: 24) "It seems that the black male of *H. littoralis* taken in cop., is *H. niveifrons.*" He also found all species nesting in burrows, side by side, at Sandringham, Victoria. The reason for dividing these bees into separate species was his belief that gastral colours were species specific. To highlight this point he (Rayment, 1935, pl. 40) produced a colour plate titled "A Chromatic Scale showing the Evolution of Black Bands (on the gaster) in a Chloralictine group of bees." This figured all the above mentioned species and a few species now placed in *Lasioglossum (Chilalictus).*

Variability within females is restricted to scutal and gastral colour. The cause of gastral variation is not gut contents seen through the gaster, (as is the case in the '*dotatus*' species-group) rather the pigmentation of the sclerites. The colour ranged from light red-brown to completely dark brown suffused with light brown. Scutal colour variation is either blue or green, with northern specimens predominantly blue and southern specimens green.

Males exhibit a cline of increasing size from north to south. No such cline was found in females.

Distribution. Coastal south-east Queensland to Victoria, and into South Australia and Tasmania (Fig. 3a).

Homalictus pectinalus sp. nov.

Figures 3a; 7g; 10e; 11s

Material examined.

Holotype ♀, 17°41'S., 145°26'E., Millstream Falls Nat. Pk, Queensland, 24-25 May 1980, I.D. Naumann & J.C. Cardale (ANIC).

Paratypes 10 ♀♀, 15°47'S., 145°17'E., Moses Ck, 4 km NE. of Mt Finnigan, 14-16 Oct 1980, Queensland, J.C. Cardale, ex. ethanol (ANIC).

Other specimens examined: (6 ♀♀) (PD: 5-6,8,10) (FR: *Acacia, Eucalyptus*) QUEENSLAND: Palmerston Nat. Pk, via Innisfail (UQIC); Mt Finnigan (ANIC); Kirrama Range via Kennedy (QDPI); Kuranda (BMNH).

Diagnosis. A member of the '*sphecodoides*' species-group; female distinguished from other members of the genus by the following combination of characters: head and propodeum black; frons smooth, a few weak vertical striae below ocelli (Fig. 7g); scutum impunctate on anterior one third, remainder with sparse piliferous punctures; dorsolateral angle of pronotum projecting as a small acute spine; dorsal surface of propodeum with areolate rugae mesially, rim smooth and shining (Fig. 11s).

Female. BL 4.2-4.8 mm (holotype c. 4.8 mm); FL 3.3-3.7 mm (holotype c. 3.7 mm); head wider than long (52:43); UID:LID as 31:30; clypeus slightly convex, width less than three times length (25:10); antennal sockets separated by distance less than diameter of socket. AOD:IAD:OAD:IOD:OOD as 11:3:19:8:9. Antennal scape extending to level of posterior margin of median ocellus; dorsolateral angle of pronotum projecting as small acute spine; BP complete, bluntly angulate apically; TS with three small teeth (proximal tooth largest and apically rounded, distal teeth acute) and slightly smaller than outer spur.

Sculpturing. Head smooth, frons (Fig. 7g) with weak vertical striae extending to below level of anterior margin of median ocellus; clypeus and supraclypeal area finely reticulate, impunctate; scutum (Fig. 10e) with fine transverse lineolation on anterior one third, remainder distinctly tessellate, with minute piliferous sparse punctures; scutellum finely reticulate, minutely openly punctured; dorsal surface of propodeum (Fig. 11s) with rugulae, areolate mesially, extending at least half length of dorsal surface, parallel laterally extending to rim, rim smooth and polished.

Colour. Head, scutellum and propodeum black; basal half of antennal scapes red-brown, remainder black, flagellum black above, dark brown beneath; scutum blue (holotype), blue-green with a golden tinge (paratypes); coxae black, mid and hind femora and hind tibiae dark brown, fore femora, tibiae and tarsi red-brown, fore tibiae suffused with dark brown mesially, mid tibiae and tarsi and hind tarsi brown; gaster black suffused with brown.

Pubescence. Sparse; frons with short, erect, simple hair except above antennal bases to level of anterior margin of frontal carina and frons laterally to level of antennal bases with short, erect, branched hair; lower paraocular areas with some short, plumose, adpressed hair; clypeus and supraclypeal area almost bare, a few short, branched and long, simple hairs along anterior margin of clypeus; genae with long, branched hair; scutum sparsely covered with short, erect, simple hair, scutellum evenly covered with similar hair; vertical surface of propodeum with some short, branched hair; gastral terga almost bare, a few short, simple hairs on terga III, IV, V, a few long, minutely branched hair on lateral margins of terga IV, V.

Remarks. This new species superficially resembles members of the '*blackburni*' species-group, but is easily distinguished in the females by the presence of a fore basitarsal comb. The specific name refers to this character.

Male unknown.

Distribution. North Queensland (Fig. 3a).

Homalictus punctatus (Smith)

Figures 3a; 7f; 9r; 11r; 17g-i; 26a

Halictus punctatus Smith, 1879: 36.–Cockerell, 1912: 384.–1922b: 661.–1933: 318.–Rayment, 1931a: 168.

Halictus punctatus exlautus Cockerell, 1905a: 300.–1922b: 661-2.(Cockerell considered Smith's species name *punctatus* was preoccupied by *Nomia punctata* Smith, 1859: 5. He examined the type male of *N. punctata* and stated it "is a male *Halictus*", then recognised that his species *H. punctatus exlautus* "is an individual variation, not a distinct

race" and suggested Smith's specific name *punctatus* (1879) be replaced by *exlautus*. *Homalictus punctatus* (Smith, 1879) is not a preoccupied name.).–1933: 318, syn. nov.

Halictus hedleyi Cockerell, 1910: 231.–1914a: 504.–1933: 312, syn. nov.

Halictus pallidifrons Rayment, 1935: 692, syn. nov.

Halictus subpallidifrons Rayment, 1935: 693, syn. nov.

Halictus phillipensis Rayment, 1935: 700, syn. nov.

Homalictus punctatus.–Michener, 1965: 181.

Homalictus exlautus.–Michener, 1965: 180.

Homalictus hedleyi.–Michener, 1965: 180.

Homalictus pallidifrons.–Michener, 1965: 181.

Homalictus subpallidifrons.–Michener, 1965: 181.

Homalictus phillipensis.–Michener, 1965: 181.

Material examined.

Holotype ♀ of *Halictus punctatus*, Champion Bay, (presumably Western Australia) (BMNH).

Holotype ♀ of *Halictus punctatus exlautus*, Australia (BMNH).

Holotype ♂ of *Halictus hedleyi*, Port Philip (sic! Phillip), Victoria, Coulon (Berlin).

Holotype ♂ of *Halictus pallidifrons*, Ringwood, 5 May 1928, F.E.Wilson (ANIC).

Holotype ♂ of *Halictus subpallidifrons*, 6 miles east of Melbourne, 3 Mar 1929, T. Rayment (ANIC).

Halictus phillipensis, Sandringham, Port Phillip, Victoria, 21 Oct.1926, Rayment. (Rayment, unfortunately, has made an obvious mislabelling error with the type of this species. The handwritten type label is on a specimen in the ANIC, but the characters of this specimen and its locality label do not match those given in the original description. Michener (1965: 180-181) noted this discrepancy and commented the specimen was similar to *Lasioglossum (Parasphecodes) clarigaster*. Rayment labelled a number of specimens as 'Cotype' (though none is a syntype as only the holotype is recorded in the description) and as they match both the original description and locality data, the synonymy has been based on these specimens.)

Other specimens examined: (167 ♀♀, 38 ♂♂) (PD: 1-5,9-12) (FR: *Myoporum, Angophora, Eucalyptus, Leptospermum, Syzygium, Bursaria, Boronia*) QUEENSLAND: Mareeba (QDPI); Tambourine Mtn (QM); Mundubbera, Wallangarra, Bunya Mts, Flatstone Ck, Mistake Mts, Fernvale, Mt Crosby, Helidon, Amiens, Leyburn, Warwick, Glen Aplin, Texas (UQIC); Brisbane (UQIC, QM); Bald Rock Nat. Pk, Birnum Range (SAM). NEW SOUTH WALES: Legume (UQIC, SAM); W. Wyalong (SAM); Wilsons Downfall (QM); Grafton, Warrumbungle Nat. Pk, Narrabri, Llangothlin, Singleton, Bathurst, Bungendore (UQIC); Barraba (ANIC); Sutherland (NMV). AUSTRALIAN CAPITAL TERRITORY: Canberra (ANIC, UQIC). VICTORIA: Healesville (UQIC); Ringwood, Eltham, Cranbourne, Wodonga (ANIC); Woori Yallock (NMV, ANIC); Melbourne (ANIC, NMV); St. Arnaud, Dunkeld, Broadford, Anglesea, Brisbane Ranges, Avenel, Merbein, Orbost, Cann River, Genoa (NMV).

Diagnosis. A member of the '*sphecodoides*' species-group, male most like *H. megastigmus*; distinguished from other members of the genus by the following combination of characters: Female–(character unique) scutum with transverse shallow furrows. Male–Fg:UID <2.0:1; UID:LID >1.3:1; head densely covered with short, plumose hair; gaster with at least terga II and III light red-brown.

Female. BL 4.6-5.8 mm (holotype c. 5.8 mm); FL 3.9-4.6 mm (holotype c. 4.6 mm); head wider than long (65:53); UID:LID as 36:38; clypeus width at least three times length (34:11); antennal sockets separated by distance equal to diameter of socket. AOD:IAD:OAD:IOD:OOD as 14:5:21:10:10. Scape reaching posterior margin of rear ocelli; dorsolateral angle of pronotum projecting as a small acute tubercle; TS with four small, sharply pointed teeth and same length as outer spur; BP complete, apically rounded.

Sculpturing. Head roughened, frons (Fig. 7f) with vertical striae extending from level of antennal bases to level of median ocellus; paraocular areas reticulate, clypeus and supraclypeal area polished and shining; clypeus sparsely punctured; scutum (Fig. 9r) polished, anteriorly and laterally reticulate, open-sparsely punctured and furrowed; scutellum smooth and polished; propodeum dull, finely reticulate, dorsal surface of propodeum (Fig. 11r) with parallel rugae, most reaching rim.

Colour. Head, antennae, scutellum, and propodeum black; scutum blue suffused with green; legs light red-brown, except coxae and trochanters dark brown or black; gastral terga red-brown with dark patches mesially.

Pubescence. Head, except supraclypeal area (bare), sparsely covered with erect, minutely branched hair; scutum, scutellum and metanotum with similar hair except along posterior margin of scutellum and metanotum mediad with short, dense, plumose hair; propodeum bare dorsally, vertical surface with long, erect, branched hair; gastral terga almost bare, except tergum V with backwardly inclined simple hair.

Male. BL 4.3-5.4 mm; FL 3.1-3.7 mm; head wider than long (56:47); eyes strongly con-

verging below, UID:LID as 36:26; scape not reaching level of median ocellus; Fg:UID as 2.4:1. AOD:IAD:OAD:IOD:OOD as 7:9:16:9:10. BP complete, apically rounded.

Sculpturing. Head coarsely reticulate; scutum anteriorly reticulate, remainder polished and smooth, open-sparsely punctured, a few transverse furrows mediad of anterior margin of parapsidal lines; scutellum smooth and shining, minutely openly punctured; dorsal surface of propodeum coarsely reticulate, a few rugulae laterally extending to rim.

Colour. Head, mesosoma black; coxae black, trochanters and basal two thirds of femora dark brown, fore tibiae and tarsi light red-brown, mid and hind tibiae and tarsi light red-brown with large areas suffused with dark brown; gastral terga I, IV, V and VI dark brown, tergum II light red-brown, III similar though with patches of dark brown, ventrally light red-brown.

Pubescence. Frons sparsely covered with erect, branched hair, lower paraocular areas, supraclypeal area and clypeus covered with short, plumose, adpressed hair; scutum and scutellum sparsely covered with erect, minutely branched hair, posterior margin of scutellum with long, erect, branched hair; vertical surface of propodeum with erect, branched hair; gastral sterna with sparse row of erect, branched hair along posterior margins.

Genitalia. Figs. 17g, h, i.
Gastral Sternum VI. Fig. 26a.

Remarks. Smith's (1879) locality for *H. punctatus* is the only record of this species from Western Australia.

Cockerell (1912: 384) noted an error in Smith's (1879) original description of *H. punctatus* which he corrected as follows: "In Smith's description read 'mesothorax (not metathorax) green' ".

Distribution. East coast of Australia excluding Cape York Peninsula and Tasmania (Fig. 3a).

Homalictus rowlandi (Cockerell)

Figures 3b; 8j; 10p; 12q

Halictus rowlandi Cockerell, 1910: 226.–1933: 319.
Homalictus rowlandi.–Michener, 1965: 181.

Material examined.

Lectotype ♀, Paralectotype ♀, Cairns, Kuranda, Queensland, Feb 1902. Turner Coll. 1910-7 (BMNH). Species described from two females (syntypes). Lectotype and Paralectotype designated here. Reason for double locality is same as for *H. maitlandi*. Correct type locality is Kuranda.

Other specimens examined: (1 ♀) (PD: 2.5-6) (FR: Not recorded) QUEENSLAND: Kuranda (BMNH).

Diagnosis. The unique characters of *H. rowlandi* do not allow its placement into any of the five described species-groups. On the basis of sculpture it is closest to the '*blackburni*' species-group but the presence of a comb of setae on the fore basitarsi excludes it from this group. Examination of a male and its genitalic characters may help to elucidate the affinities of this species. Female distinguished from other members of the genus by the following unique characters: frons, vertex, genae brown, remainder of body light red-brown; dorsal surface of propodeum smooth (Fig. 12q), rounds onto the vertical surface so that it is difficult to define.

Female. BL 4.7-4.9 mm (lectotype c. 4.7 mm); FL 3.5-3.9 mm (lectotype c. 3.7 mm); eyes converging below, UID:LID as 32:29; clypeus convex, width less than three times length (30:12); antennal sockets separated by distance less than diameter of socket. AOD:IAD:OAD:IOD:OOD as 10:4:21:8:8. Scape extending to level of posterior margin of median ocellus; TS with three narrow, pointed teeth, decreasing in size distally and slightly smaller than outer spur; BP complete, apically angulate.

Sculpturing. Head smooth (Fig. 8j), frons and supraclypeal area finely tessellate, clypeus reticulate, supraclypeal area impunctate, clypeus indistinctly sparsely punctured with shallow hair pits; scutum (Fig. 10p) and scutellum dull, finely tessellate, impunctate on anterior one third, remainder open-sparsely punctured with minute punctures; dorsal surface of propodeum (Fig. 12q) smooth.

Colour. Frons, vertex and genae dark brown; clypeus and supraclypeal area light yellow-brown; scape light brown, flagellum brown; mesosoma, legs and gaster light red-brown, except fourth axillary and second axillary sclerites of fore and hind wing respectively black to dark brown and posterior margin of terga brown.

Pubescence. Frons, vertex, genae with short, erect, minutely branched hair; lower paraocular areas and supraclypeal area with some short, branched, adpressed hair; clypeus with short, erect, simple hair except a few long, simple hairs along anterior margin; scutum and scutellum with short, simple, semi-adpressed hair, a few long, erect, branched hairs along posterior margin of scutellum; metanotum with erect, minutely branched hair; propodeum bare dorsally, vertical lateral surfaces with erect, branched hair, vertical posterior surface with a few erect, minutely branched hairs; gastral terga almost bare, a few short, simple hairs on terga III, IV, V and VI.

Distribution. North Queensland (Fig. 3b).

Homalictus scrupulosus (Cockerell)

Figures 3a; 7c; 9o; 11o; 16g-i; 25f

Halictus limatiformis scrupulosus Cockerell, 1930b: 35.–1933: 314.

Homalictus scrupulosus.–Michener, 1965: 181.

Material examined.

Holotype ♀, Nanango District, Queensland, Nov 1927, H. Hacker (QM). Two females are glued to a card on the pin carrying the holotype label. The specimen closest to the pin is missing legs and gaster; the other specimen is complete, matches the colour in the original description and is the holotype. (The letter 'H' has been placed beside this specimen.)

Other specimens examined: (12 ♀♀, 4 ♂♂) (PD: 4.9.11) (FR: *Claoxylon, Ranunculus*) QUEENSLAND: Nanango District (QM); Bulborin State Forest, Ma Ma Ck, Mt Tamborine, Cunninghams Gap, Lamington Nat. Pk (UQIC); Bunya Mts (SAM). NEW SOUTH WALES: Tooloom (UQIC).

Diagnosis. A member of the '*sphecodoides*' species-group; distinguished from other members of the genus by the following combination of characters: Female–head and propodeum black; frons with strong vertical striae across entire surface (Fig. 7e); scutum sparsely punctured. Male–clypeus without yellow or white markings; Fg:UID <2.0:1; frons with vertical striae across entire surface.

Female. BL 5.4-5.9 mm (holotype c. 5.7 mm); FL 4.4-4.6 mm (holotype c. 4.6 mm); head wider than long (65:58); UID:LID as 38:35; clypeal width less than three times length, (28:12); antennal sockets separated by distance less than diameter of socket. AOD:IAD:OAD:IOD:OOD as 14:4:23:10:11. Scape reaching posterior margin of rear ocelli; dorsolateral angle of pronotum projecting as small acute tubercle; TS with four small, blunt teeth and same length as outer spur; BP complete, apically pointed.

Sculpturing. Head roughened, frons (Fig. 7c) with vertical striae extending from level of antennal bases to level of anterior margin of rear ocelli; clypeus and supraclypeal area finely reticulate, minutely sparsely punctured; vertex with several weak transverse striae not extending to eyes; scutum (Fig. 9o) and scutellum finely reticulate, sparsely punctured; dorsal surface of propodeum (Fig. 11o) with weak areolate rugulae on anterior half.

Colour. Head, scutellum and propodeum black; scape and flagellum dark brown; scutum blue tinged with green; legs dark brown except inner surfaces of fore tibiae brown; gaster black tinged with brown.

Pubescence. Frons, vertex, supraclypeal area, clypeus and genae sparsely covered with short, simple hair; scutum sparsely covered with short, erect, simple hair; scutellum with erect, branched hair along posterior margin; metanotum with thick, short, erect, branched mediad; propodeum bare dorsally, vertical surface with long, erect, plumose hair; gastral terga I-IV almost bare, tergum V with short, branched hair.

Male. BL 5.1-5.6 mm; FL 3.8-4.1 mm; head wider than long (62:58); UID:LID as 38:32; scape reaching anterior margin of median ocellus; Fg:UID as 1.9:1. AOD:IAD:OAD:IOD:OOD as 11:7:20:10:11. BP complete, apically pointed.

Sculpturing. Head roughened, frons with vertical striae extending from level of antennal bases to anterior margin of median ocellus; clypeus and supraclypeal area smooth, minutely openly punctured; scutum and scutellum reticulate, except smooth mesially on scutum, openly punctured; dorsal surface of propodeum reticulate, a few longitudinal rugulae anteromesially.

Colour. Body black, gaster tinged with brown; fore tibiae and tarsi light red-brown, remainder of legs dark brown.

Pubescence. Frons and paraocular area covered with stout, erect, branched hair (not densely); clypeus and supraclypeal area with a few small, minutely branched hair; vertex almost bare; scutum and scutellum sparsely covered with short, erect, simple hair, a few long, branched hair along posterior margin of scutellum; vertical surface of propodeum with short, erect, branched hair; gastral sterna with distinct rows of long, branched hair along posterior margins.

Genitalia. Figs. 16g, h, i.

Gastral Sternum VI. Fig. 25f.

Remarks. The body colours of the holotype are not usual for this species. Only two female specimens (from a different locality, Ma Ma Ck, Queensland) have been found with similar colours to the holotype. The perfect condition of these three specimens, in particular their entire wing margins and their light brown colour, suggests they are teneral adults. All other specimens matching the sculpture characters of the holotype are black and dark brown.

Distribution. South-east Queensland (Fig. 3a).

Homalictus sphecodoides (Smith)

Figures 3a; 4d; 7a; 9m; 11m; 16a-e; 25d

Halictus sphecodoides Smith, 1853: 58. Cockerell, 1933: 321.

Halictus limatus Smith, 1853: 59.–Cockerell, 1933: 314.–Rayment, 1953: 21. syn. nov.

Halictus humilis Smith, 1879: 36. Cockerell, 1910: 228.–1933: 313. syn. nov.

Halictus burkei Cockerell, 1906: 58.–1933: 306. syn. nov.

Halictus demissus Cockerell, 1916: 371.–1933: 308.–Rayment, 1930b: 54-5.–1935: 298.–1953: 13-14, fig. 25. syn. nov.

Halictus limatiformis Cockerell, 1922a: 263.–1933: 314. syn. nov.

Halictus humiliformis Cockerell, 1922a: 263.–1933: 313.–Rayment, 1947: 105.–1953: 20. syn. nov.

Homalictus sphecodoides.–Michener, 1965: 181.

Homalictus limatus.–Michener, 1965: 180.

Homalictus humilus.–Michener, 1965: 180.

Homalictus burkei.–Michener, 1965: 179.

Homalictus demissus.–Michener, 1965: 180.

Homalictus limatiformis.–Michener, 1965: 180.

Homalictus humiliformis.–Michener, 1965: 180.

Material examined. Holotype ♀ of *Halictus sphecodoides*. VDL (Van Diemen's Land) New Holland (BMNH). Only 'New Holland' was given in the original description but holotype has the additional 'VDL' label. Gaster missing.

Holotype ♀ of *Halictus limatus*, VDL (Van Diemen's Land) (BMNH).

Holotype ♀ of *Halictus humilis*, Australia (BMNH). The type locality for *H. humilis* in Smith's description is 'Champion Bay' (presumably Western Australia) yet the type locality label has only 'Australia'.

Holotype ♀ of *Halictus burkei*, Hobart, Tasmania, 1891-155, J.J. Walker (BMNH).

Holotype ♀ of *Halictus demissus*, Launceston, Tasmania, 1 Nov 1914, F.M. Littler (USNM).

Holotype ♀ of *Halictus limatiformis*, National Pk, Queensland, Dec 1919, H. Hacker (QM).

Holotype ♀ of *Halictus humiliformis*, Ebor, N.S.W., 30 Dec 1915, A.J. Turner (QM).

Other specimens examined: (209 ♀♀, 73 ♂♂) (PD: 1-3,5,7,9-12) (FR: *Schinus, Helichrysum, Wahlenbergia, Ixodea, Goodenia, Lagunaria, Eucalyptus, Gastrolobium, Jacksonia, Banksia, Cotoneaster*) QUEENSLAND: Peregian (QM); Lamington National Pk, Helidon, North Pine River, Brisbane, Teviot Gap (UQIC); Rathdowney (SAM); Bunya Mts (UQIC, SAM). NEW SOUTH WALES: Guyra, Warrumbungle Nat. Pk, Bowning (UQIC); Braidwood (ANIC); Ben Lomond (QM); Wentworth, Chatswood (SAM). AUSTRALIAN CAPITAL TERRITORY: Black Mtn (ANIC). VICTORIA: Torquay (UQIC); Chelsea, Mitta Mitta R., Mt Dandenong, Horsham, Halls Gap, Grampians, Gorae West, Kerang (NMV). TASMANIA: Bronte Pk, Port Arthur (ANIC); Launceston, Hobart (SAM). SOUTH AUSTRALIA: Hawker (UQIC); Adelaide, Belair, Golden Grove, Robe, Mt Lofty, Waitpinga, Glen Osmond, Mt Serle, Mitcham, Tusmore, Victor Harbour, Mt Pleasant (SAM). WESTERN AUSTRALIA: Karridale (WAM); Yanchep (BMNH).

Diagnosis. A member of the '*sphecodoides*' species-group, most like *H. houstoni*; distinguished from other members of the genus by the following combination of characters: Female–(unique) malus of strigilis comb-shaped; (additional) head and propodeum black; frons coarsely reticulate; scutum

punctured close-openly in parapsidal areas, closely along hind margin, remainder sparsely (Fig. 9m). Male–clypeus without yellow or white markings; Fg:UID >2.0:1; UID:LID >1.3:1; head covered with short, plumose hair; pronotal tubercle, scape and gaster black.

Female. BL 4.4-6.2 mm (holotype c. 4.5 mm); FL 3.2-4.3 mm (holotype c. 3.2 mm); head wider than long (59:53); UID:LID as 37:33; clypeus width less than three times the length (26:10); antennal sockets separated by distance less than diameter of socket. AOD:IAD:OAD:IOD:OOD as 12:6:21:11:10. Scape reaching anterior margin of median ocellus; dorsolateral angle of pronotum projecting as small rounded tubercle; malus of strigilis comb-shaped (Fig. 4d); TS with four small, blunt teeth and same length as outer spur; BP complete, apically rounded.

Sculpturing. Head roughened, frons (Fig. 7a) coarsely reticulate, basal one third of clypeus and supraclypeal area finely reticulate, sparsely punctured on former, on latter openly punctured; scutum (Fig. 9m) tessellate anteriorly and laterally in parapsidal areas, elsewhere smooth and shining, close-openly punctured in parapsidal areas, closely along posterior margin, remainder sparsely punctured; scutellum shining and sparsely punctured; propodeum dull, finely reticulate, dorsal surface of propodeum (Fig. 11m) with strong rugae reaching rim.

Colour. Head, antennae, scutellum, propodeum and gaster black; scutum dark blue-green; fore tibiae and tarsi dark brown, remainder of foreleg, and mid and hind legs black.

Pubescence. Frons and vertex sparsely covered with short erect hair; paraocular areas, genae, sparsely on clypeus, sides of mesosoma with long minutely branched hair; scutum and scutellum with a few erect minutely branched hair; gastral terga almost bare, tergum V with short, branched hair.

Male. BL 4.2-5.1 mm; FL 3.1-3.4 mm; head wider than long (50:42); eyes converging strongly below, UID:LID as 30:22; scape not reaching level of median ocellus; Fg:UID as 2.4:1. AOD:IAD:OAD:IOD:OOD as 6:7:15:8:8. BP complete, apically rounded.

Sculpturing. Head coarsely reticulate; scutum finely reticulate anteriorly and laterally, remainder smooth and shining, open-sparsely punctured, except in parapsidal areas openly punctured; scutellum smooth and shining with a few piliferous punctures; dorsal surface of propodeum with strong rugae reaching rim.

Colour. Head, mesosoma and gaster black, except along posterior margins of terga brown; pronotal tubercle black; fore tibiae and all tarsi light brown, mid and hind tibiae dark brown suffused with patches of light brown, remainder of legs dark brown.

Pubescence. Frons, paraocular areas, clypeus and supraclypeal area covered with short, plumose, adpressed hair; metanotum and sides of mesosoma with long branched hair; gastral sterna with rows of short, simple hair along posterior margins.

Genitalia, Figs. 16a, b, c.

Gastral Sternum VI. Fig. 25d.

Remarks. Rayment (1930b: 54-55; 1953: 20) described the males of *Halictus demissus* and *H. humiliformis* respectively. Both specimens were nominated as 'Allotype', but the type status is not valid.

Apart from size variations, species characters are relatively consistent. Smith's (1853: 58) description of *H. sphecodoides* states (female) "anterior tibiae . . ferruginous; the anterior tibiae frequently black". Examination of numerous specimens produced only two with the fore tibiae "ferruginous"; the black form is the more usual.

Distribution. South-east Queensland to Victoria, Tasmania, South Australia and south-west Western Australia (Fig. 3a).

Homalictus sphecodopsis (Cockerell)

Figures 2b; 6k; 9k; 11k; 15a-c; 25a

Halictus sphecodopsis Cockerell, 1905a: 300.–1933: 321.–Rayment, 1953: 22.

Halictus eyrei Cockerell, 1910: 226.–1933: 310. syn. nov.

Halictus claripes Friese, 1924: 235, syn. by Cockerell, 1929a: 12.
Halictus eyrei darwinensis Cockerell, 1929b: 2.–1933: 310, syn. nov.
Homalictus sphecodopsis.–Michener, 1965: 181.
Homalictus eyrei.–Michener, 1965: 180.
Homalictus claripes.–Michener, 1965: 179.
Homalictus darwinensis.–Michener, 1965: 180.

Material examined.
Holotype ♂ of *Halictus sphecodopsis*, Mackay, Queensland, Nov 1891, 710, No. 94.61, Turner (BMNH).
Holotype ♀ of *Halictus eyrei*, Mackay, Queensland, Nov 1899, Turner (7a) (BMNH). Gaster missing.
Lectotype ♀ of *Halictus claripes*, Mackay, Queensland, Mar 1900, Turner (AMNH). Additional label: '*H. eyrei*' in Cockerell's handwriting; Lectotype designated by A. Pauly (in press).
Holotype ♀ of *Halictus darwinensis*, Port Darwin, Northern Territory, 1 Jan 1915, G.F. Hill (AMNH).
Other specimens examined: (320 ♀♀, 54 ♂♂) (PD: 1-3,5-8,10-12) (FR: *Helipterum, Hypochoeris, Angophora, Callistemon, Eucalyptus, Eugenia, Leptospermum, Melaleuca, Syncarpia, Tristaniopsis, Xanthorrhoea*). NORTHERN TERRITORY: Wildman R. Arnhem Highway (QDPI); Pine Creek (UQIC); Darwin (UQIC, ANIC). QUEENSLAND: St Pauls Moa (Banks) Is., Coen, Laura, Lakeland, Kirrama Range, Mt Carbine, Tolga, Herberton, Townsville, Yeppoon, Rockhampton, Biloela, Gayndah, Monto, Biggenden, Mundubbera, Beerwah, Bribie Is., Brisbane (UQIC); Mareeba, Cooktown (UQIC, QDPI, SAM); Mt Garnet, Mt Molloy (QDPI); Kuranda (ANIC, SAM); Mackay (BMNH, UQIC, NMV).

Diagnosis. A member of the '*dotatus*' species-group, most like *H. dotatus*; distinguished from other members of the genus by the following combination of characters: Female–anterior half of clypeus light red-brown; dorsal surface of propodeum relatively smooth; scutum, anterior one fifth reticulate, remainder closely punctured. Male–clypeus with anterior two thirds dull white; frons paraocular areas and supraclypeal area covered with short, plumose, adpressed hair; scutum closely punctured.

Female. BL 4.8-5.3 mm; FL 3.5-3.9 mm; head wider than long (58:45); UID:LID as 32:35; clypeus width greater than three times the length (30:8); antennal sockets separated by distance equal to diameter of socket. AOD:IAD:OAD:IOD:OOD as 12:5:19:9:8. Scape reaching anterior margin of median ocellus; dorsolateral angle of pronotum projecting as a small rounded tubercle; TS with three pointed teeth and same length as outer spur; BP complete and apically rounded.

Sculpturing. Head (Fig. 6k) relatively smooth; frons,vertex, supraclypeal area and posterior two thirds of clypeus reticulate, anterior one third of clypeus smooth, marked with shallow depression; scutum (Fig. 9k), anterior one fifth weakly reticulate, remainder of scutum and scutellum closely punctured; dorsal surface of propodeum (Fig. 11k) with areolate rugulae mediad, weak parallel rugulae laterally not extending to rim.

Colour. Frons, vertex, supraclypeal area, posterior half of clypeus, and genae copper-green; anterior half of clypeus light brown tinged with red; scape and flagellum beneath orange-brown, apical one third of scape and flagellum above, brown; margins of pronotal tubercle yellow; scutum green with tinges of golden red; scutellum black with golden sheen; propodeum dark green with tinges of gold; trochanters, femora, tibiae, tarsi and mid coxae orange red-brown, fore and hind coxae dark brown; gaster orange red-brown.

Pubescence. Frons with short, white hair, paraocular areas with short, plumose, adpressed hair; clypeus and vertex with long, simple hair; scutum with sparse, short, white hair, mesially directed obliquely away from mid line, laterally directed inwards, both sets meeting along parapsidal line.

Male. BL 4.1-4.7 mm (holotype c. 4.2 mm); FL 3.0-3.4 mm (holotype c. 3.1 mm); head wider than long (49:42); eyes not converging below, UID:LID as 28:28; scape not reaching level of median ocellus; Fg:UID as 2.2:1. AOD:IAD:OAD:IOD:OOD as 8:6:15:9:6. BP complete, apically rounded.

Sculpturing. Head reticulate; scutum anteriorly reticulate, remainder of scutum and scutellum closely punctured; dorsal surface of propodeum almost smooth, one or two short rugulae mediad, a few parallel rugulae lateral not reaching rim.

Colour. Frons, vertex, genae, scutellum and propodeum dark green; clypeus with anterior two thirds dull white, remainder dark green; scape and flagellum light red brown; pronotal tubercle white; scutum, scutellum and prop-

odeum dark green with a golden tinge; fore and hind coxae dark green, mid coxae and all legs light red brown; gaster orange red-brown.

Pubescence Frons, paraocular areas, supraclypeal area and basal one third of clypeus completely covered with short, plumose, adpressed hair; vertex with short, simple hair; genae with erect, branched hair; scutum with short backwardly inclined simple hair, anterior lateral corners with thick, short, plumose, adpressed hair; scutellum and metanotum with a few long simple hairs.

Genitalia. Figs. 15a, b, c.

Gastral Sternum VI. Fig. 25a.

Remarks. The colours of the body in are consistent with the exception of the clypeus and abdomen. The anterior half of the clypeus in females varies from brown to red-brown while in dark patches on the gaster are variable, dependent on internal air bubbles and gut contents.

Distribution. Coastal Queensland and northern Northern Territory (Fig. 2b).

Homalictus stradbrokensis (Cockerell)

Figures 4a; 8f; 10l; 12m; 22a-c; 27d

Halictus urbanus stradbrokensis Cockerell, 1916: 365.–1933: 323.

Homalictus stradbrokensis.–Michener, 1965: 181.

Material examined.

Holotype ♀, Queensland, Stradbroke Is., H. Hacker (USNM).

Other specimens examined: (72 ♀♀, 13 ♂♂) (PD: 8,10-12) (FR: *Angophora, Eucalyptus, Leptospermum, Xanthorrhoea*) QUEENSLAND: Dunwich, Stradbroke Is., Toowoomba, Caloundra, Cooloola State For., Tewak Ck, via Tin Can Bay, Noosa, Fraser Is., Mt Morgan, Cairns (UQIC); Bribie Is., Glass House Mts, Noosa-Coolum area, Maidenwell (SAM).

Diagnosis. A member of the '*urbanus*' species-group, most like *H. bremerensis*; distinguished from other members of the genus by the following combination of characters: Female–labrum with two raised tubercles; frons with vertical striae; scutum punctured, closely in parapsidal areas, mesad of parapsidal lines and along posterior margin, mesially open except along midline closely; vertical posterior surface of propodeum with long, plumose hair. Male–Fg:UID <2.0:1; EW:GW <2.5:1; frons reticulate; scutum coppery tinged with red, sparsely punctured in parapsidal areas; genitalia, in ventral view, with apical processes of gonocoxites broad.

Female. BL 5.4-6.4 mm (holotype c. 6.3 mm); FL 3.9-4.5 mm (holotype c. 4.4 mm); head wider than long (65:56); eyes converging below, UID:LID as 37:34; clypeus convex, width about twice length (30:14); antennal sockets separated by distance equal to diameter of socket. AOD:IAD:OAD:IOD:OOD as 14:5:22:12:10. Scape extending to level of anterior margin of median ocellus; EW:GW as 2.3:1; dorsolateral angle of pronotum projecting as small blunt tubercle; TS with four blunt teeth, proximal three large, distal tooth minute and about half length of outer spur; BP complete, bluntly angulate apically.

Sculpturing. Head roughened (Fig. 8f), frons with vertical striae to level of anterior margin of rear ocelli; vertex with transverse striae extending onto genae; supraclypeal area and basal half of clypeus finely reticulate, sparsely punctured (a few closely punctured), anterior half of clypeus smooth and polished, several wide, shallow punctures along anterior margin; scutum (Fig. 10l) and scutellum reticulate, scutum anteriorly impunctate, in parapsidal areas, mesad of parapsidal lines and along posterior margin closely punctured, mesially openly punctured, except along midline as in parapsidal areas; scutellum sparsely punctured, except along anterior margin densely punctured; dorsal surface of propodeum (Fig. 12m) with areolate rugae, extending onto vertical surface.

Colour. Frons, paraocular areas and supraclypeal area dark blue-green or blue; clypeus on basal half green tinged with gold, anterior half dark brown to black; scape and flagellum above dark brown, flagellum beneath light brown; scutum and scutellum royal blue tinged with gold; propodeum dark blue; legs dark brown or black; gaster dark brown-black.

Pubescence. Head sparsely covered with erect, minutely branched hair, a few long, simple hairs along anterior margin of clypeus; scutum and scutellum with both erect, minutely branched and short, erect, simple

hair; metanotum and posterior margin of scutellum with some long, erect, branched hair; propodeum bare dorsally, vertical posterior surface densely with long, erect, plumose hair; gastral terga I and II almost bare, remainder sparse, though with increasing density of short, backwardly directed, simple and minutely branched hair.

Male. BL 4.4-5.4mm; FL 3.0-3.5 mm; head wider than long (59:51); eyes converging below, UID:LID as 35:25; scape extending almost to level of anterior margin of median ocellus; Fg:UID as 1.8:1; EW:GW as 2.1:1. AOD:IAD:OAD:IOD:OOD as 9:7:18:10:10. BP complete, bluntly angulate apically; TS two thirds length of outer spur.

Sculpturing. Frons reticulate; clypeus and supraclypeal area shining though finely reticulate, weakly punctured; vertex with transverse striae extending onto genae; scutum reticulate, impunctate anteriorly, remainder openly punctured, except at posterior end of parapsidal lines closely punctured; scutellum finely reticulate, sparsely punctured except along anterior margin openly punctured; dorsal surface of propodeum with areolate rugae mesially, branched elsewhere, extending to rim.

Colour. Frons green tinged with gold; clypeus and supraclypeal area dark green; scutum and scutellum coppery green tinged with red; metanotum and propodeum dark blue; coxae, trochanters, femora dark brown, fore tibiae and tarsi light red-brown, mid and hind tibiae brown suffused with light red-brown; gaster dark brown.

Pubescence. Frons and vertex sparsely covered with erect, minutely branched hair; lower paraocular areas, supraclypeal area, clypeus and genae sparsely covered with both short, apiead directed, branched hair and short, adpressed, plumose hair; scutum and scutellum with erect, minutely branched hair; metanotum and posterior margin of scutellum with some long, erect, branched hair; vertical surface of propodeum with short, minutely branched hair; gastral terga almost bare, some short, simple hair increasing in density from tergum II.

Genitalia. Figs. 22a, b, c.
Gastral Sternum VI. Fig. 27d.

Distribution. Coastal Queensland, predominately in the south-east corner (Fig. 4a).

Homalictus tatei (Cockerell)

Figures 2b; 6i; 9i; 11i

Halictus tatei Cockerell, 1910: 227.–1933: 322.
Halictus saycei Cockerell, 1912: 286.–1933: 320, syn. nov.
Homalictus tatei.–Michener, 1965: 181.
Homalictus saycei.–Michener, 1965: 181.

Material examined.
Holotype ♀ of *Halictus tatei*, Mackay, Mar 1900, Eucalypt, Turner Coll., 1912-111 (BMNH).
Lectotype ♀ *Halictus saycei*, Mackay, Apr 1900, 321, 7c, Turner Coll. 1912-111 (BMNH). Two syntypes were examined, both with 'type' in Cockerell's handwriting. One designated as lectotype.
Other specimens examined: (11 ♀♀, 1 ♂) (PD: 2,3,12) (FR: *Eucalyptus*) QUEENSLAND: Mackay (BMNH, NMV); 40 Mile Scrub via Mt Garnet (QDPI).

Diagnosis. A member of the '*sphecodoides*' species-group; distinguished from other members of the genus by the following combination of characters: Female–frons with weak vertical striae below ocelli (Fig. 6i); scutum punctured, anteromesially and in parapsidal areas closely, remainder open-sparsely (Fig. 9i). Male–clypeus without yellow or white markings; Fg:UID >2.0:1; head sparsely covered with short, branched hair; scutum openly punctured.

Female. BL 4.8-5.1 mm (holotype c. 5.0 mm); FL 3.7-3.9 mm (holotype c. 3.9 mm); head wider than long (58:50); UID:LID as 33:32; clypeus width three times length (30:10); antennal sockets separated by distance less than diameter of soeket. AOD:IAD:OAD:IOD:OOD as 13:4:21:9:8. Scape reaching posterior margin of median ocellus; dorsolateral angle of pronotum projecting as small aeute spine; TS with six sharply pointed teeth (distal four small) and slightly smaller than outer spur; BP complete, apieally rounded.

Sculpturing. Head weakly roughened, frons (Fig. 6i) beneath ocelli with weak vertical striae, not continuing around eye, lateral frons

smooth, finely reticulate; clypeus, supraclypeal area open-sparsely punctured, vertex reticulate; scutum (Fig. 9i) anteriorly weakly reticulate, anteromesially and in parapsidal areas closely punctured, remainder sparsely punctured; dorsal surface of propodeum (Fig. 11i) with weak areolate rugulae medianly, laterally with parallel rugulae extending onto vertical propodeum.

Colour. Head, scutellum and propodeum black; scape dark orange-brown, dark brown distally above, flagellum black above, brown beneath; pronotal tubercle light red-brown; scutum dull, dark green; apical half of fore and mid femora, tibiae, tarsi and apical one third of hind femora light red-brown, trochanters, remainder of femora and hind tibiae dark brown, hind tibiae suffused with red-brown; gaster red-brown suffused with dark brown patches.

Pubescence. Head sparsely covered with short, white hair; scutum, scutellum and metanotum medianly with short, light-brown hair; sides of propodeum with long, branched hair.

Male. BL (estimated) c. 4.3 mm; FL c. 3.2 mm; head wider than long (46:40); eyes converging below, UID:LID as 29:22; scape not reaching level of median ocellus; Fg:UID as 2.1:1. AOD:IAD:OAD:IOD:OOD as 8:6:15:9:7. BP complete, apically rounded.

Sculpturing. Head finely reticulate, weak vertical striae on frons extending from above antennal bases to below level of median ocellus; supraclypeal area impunctate, clypeus sparsely punctured; scutum finely reticulate, close-openly punctured; scutellum smooth and shining, impunctate; dorsal surface of propodeum with areolate rugulae mesially, laterally parallel rugulae not extending to vertical surface.

Colour. Head, mesosoma and propodeum black; scape and flagellum brown; coxae, trochanters, mid and hind tibiae dark brown, fore tibiae and all tarsi light red-brown, mid and hind tibiae suffused with brown.

Pubescence. Head sparsely covered with short, erect, minutely branched hair, some long, simple hairs on anterior margin of clypeus; scutum and scutellum sparsely covered with short, erect, simple hair; posterior margin of metanotum with a few long, erect, branched hairs; vertical surface of propodeum with short, erect, branched hair.

Remarks. In females the amount of black colour on the fore and mid femora is variable.

One male was associated but was missing the gaster.

Distribution. Restricted to central and northern coastal Queensland (Fig. 2b).

Homalictus thor (Cockerell)

Figures 2a; 6a; 9b; 11a)

Halictus flindersi thor Cockerell, 1929b: 12.–1933: 310.
Homalictus thor.–Michener, 1965: 181.

Material examined.

Holotype ♀, Thursday Island, 15 Mar 1929, T.D.A. Cockerell (USNM).

Other specimens examined: (5 ♀♀) (PD: 3-4,7,11) (FR: *Parinari, Dalbergia, Calandrina*) QUEENSLAND: Bamaga, Coen, Mellwraith Range (UQIC); Iron Range (ANIC).

Diagnosis. A member of the '*flindersi*' species-group, most like *H. behri*; female distinguished from other members of the genus by the following combination of characters: Female–dorsal surface of propodeum defined by carinae; BP complete; scutum (Fig. 9b) with a few weak transverse striae anteriorly, dense-closely punctured laterally and along posterior margin, remainder open-sparsely punctured; mid and hind femora dark green, except apical one third red-brown; gastral tergum 1 with minute hair pits.

Female. BL 6.7-7 mm (holotype c. 7.0 mm), FL 4.7-5.5 mm (holotype c. 5.5 mm); head wider than long (75:69); UID:LID as 41:38; clypeus less than three times as wide as long (38:12), convex, protruded; antennal sockets separated by diameter of socket, AOD:IAD:OAD:IOD:OOD as 12:6:27:13:9:5. Scape reaching posterior margin of median ocellus; dorsolateral angle of pronotum projecting as a blunt spine; dorsal surface of propodeum defined by carinae, same length as scutellum; TS with four blunt

teeth and shorter than outer spur; BP complete, bluntly angulate.

Sculpturing. Head coarsely roughened, frons (Fig. 6a) with vertical striae and interconnectives, vertical striae continue around eye, transverse striae in front of ocelli, median area above antennal bases reticulate; clypeus shining, variously punctured (dense, open, sparse); scutum (Fig. 9b) with a few weak transverse striae anteriorly, dense-closely punctured laterally and along posterior margin, remainder open-sparsely punctured; scutellum smooth medianly, sparsely punctured; dorsal surface of propodeum (Fig. 11a) with areolate rugae extending to rim; gastral tergum I with distinct hair pits.

Colour. Frons, vertex and genae golden green; clypeus and supraclypeal area copper, former suffused with red; basal half of scape light red-brown, remainder dark brown; flagellum light brown; scutum and scutellum golden green with tinge of blue; propodeum dark green; trochanters and proximal four fifths of fore femora green, proximal two thirds of mid and hind femora brown, remainder of legs light red-brown; gaster steel-blue.

Pubescence. Frons, vertex, paraocular areas and supraclypeal area evenly covered with well spaced, erect, minutely branched hair; clypeus (mainly along anterior margin) with forwardly directed, simple hair; genae with erect, simple hair; scutum sparsely covered with short, erect, simple hair; scutellum with a few long, erect, branched hairs; propodeum bare dorsally, vertical surface with long, erect, branched hair; gastral terga I and II almost bare, terga III, IV and V with increasing density of hair.

Distribution. Cape York Peninsula, Queensland (Fig. 2a).

Homalictus urbanus (Smith)

Figures 4a; 8c; 10i; 12j; 19g-i; 26i

Halictus urbanus Smith, 1879: 35.–Cockerell, 1910: 227.–1933: 322.–Rayment, 1935: 261.–1939: 278.

Halictus urbanus baudinensis Cockerell, 1905b: 307.–1933: 322 syn. nov.

Halictus kesteveni Cockerell, 1912: 286.–1933: 312. syn. nov.

Halictus hackeriellus Cockerell, 1914a: 507.–1933: 312. syn. nov.

Halictus pavonellus Cockerell, 1915a: 5.–1933: 318. syn. nov.

Halictus olivinus Cockerell, 1922a: 262.–1933: 317. syn. nov.

Halictus urbanus lomatiae Cockerell, 1922a: 263.–1933: 322. syn. nov.

Halictus microchalceus Cockerell, 1929b: 13.–1933: 316. syn. nov.

Halictus subcarus Cockerell, 1930a: 152.–1933: 321. syn. nov.

Halictus williamsi Cockerell, 1930a: 153.–1933: 324. syn. nov.

Halictus suburbanus Cockerell, 1930b: 45.–1933: 322.–Rayment, 1935: 704. syn. nov.

Homalictus urbanus.–Michener, 1965: 181.

Homalictus baudinensis.–Michener, 1965: 179.

Homalictus kesteveni.–Michener, 1965: 180.

Homalictus hackeriellus.–Michener, 1965: 180.

Homalictus pavonellus.–Michener, 1965: 180.

Homalictus olivinus.–Michener, 1965: 180.

Homalictus lomatiae.–Michener, 1965: 180.

Homalictus microchalceus.–Michener, 1965: 180.

Homalictus subcarus.–Michener, 1965: 181.

Homalictus williamsi.–Michener, 1965: 181.

Homalictus suburbanus.–Michener, 1965: 181.

Material examined.

Lectotype ♀ of *Halictus urbanus*, Champion Bay, Western Australia (BMNH). Head missing. Lectotype designated by A. Pauly (in press).

Holotype ♀ of *Halictus urbanus baudinensis*, Baudin Is., N.W. Australia, J.J. Walker, 675 Collected on the 'Penguin' Expedition. (BMNH).

Holotype ♂ of *Halictus kesteveni*, Kuranda, Cairns, Queensland, Mar 1902, Turner (BMNH).

Holotype ♂ of *Halictus hackeriellus*, Brisbane, Queensland, 13 May 1912, H. Hacker (QM).

Holotype ♀ of *Halictus pavonellus*, Bribie Is., Queensland, 2 Sep 1913, H. Hacker (USNM).

Holotype ♂ of *Halictus olivinus*, Brisbane, Queensland, 3 Mar 1914, H. Hacker (QM).

Holotype ♀ of *Halictus urbanus lomatiae*, Sunnybank, Brisbane, Queensland, 13 May 1912, H. Hacker, on flowers of Lomatia (QM).

Holotype ♂ of *Halictus microchalceus*, Thirroul, New South Wales, 25 Mar (? year), Cockerell (ANIC).

Holotype ♀ of *Halictus subcarus*, Halifax, Queensland, 11-20 Jul 1919, F.X. Williams (MCZ).

Holotype ♀ of *Halictus williamsi*, Halifax, Queensland, 20 Jun–9 Jul 1919, F.X. Williams (MCZ).

Holotype ♂ of *Halictus suburbanus*, National Pk, Queensland, 1000 m, 1 Mar 1921, Turner (QM).

Other specimens examined: (2314 ♀♀, 756 ♂♂) (PD: 1-5,7-12) (FR: *Cassia, Waltheubergia, Terminalia, Helipterum, Hypochoeris, Frankenia, Scaevola, Trachymene, Amyema, Acacia, Angophora, Calothamnus, Eucalyptus, Leptospermum, Melaleuca, Daviesia, Jacksonia, Swainsonia, Bursaria, Pittosporum, Calandrina, Hakea, Alphitonia, Atalaya, Heterodendron, Morgania, Brachychiton, Hypochoeris*) QUEENSLAND: Dunwich, Rathdowney, Beerwah, Yelarbon, Bulburin St. For.,

Noosa, Tin Can Bay, Bunya Mts, Toogoolawah, Maleny, Cunningham's Gap, Warwick, Kilcoy, Texas, Helidon, Drillham, Macalister, Oakey, Inglewood, Dulacca, Toloom, Goodiwindi, St George, Moonie, Bollon, Cunnamulla, Yowah, Thargomindah, Charleville, Windorah, Carnarvon Gorge, Maryland, Longreach, Blackall, Emerald, Benarkin, Banana, Rockhampton, St Ruth, Ellis Beach, Townsville, Mt Isa, Gregory Downs, Georgetown, Burketown, Innisfail, Bowen, Mt Carbine, Cooktown, Palmer River, Lockerbie (UQIC); Miles, Fernvale, Noosa- Coolum, Eidsvold, Mitchell, Wallangarra, Nanango, Levers Plateau (SAM); Morven, Quilpie, Charters Towers (UQIC, SAM); Brisbane, Bribie Is., Stradbroke Is., Caloundra, Cooloola, Mt. Glorious, Dunk Is. (UQIC, QM); Leslie Dam via Warwick, Condamine, Roma, Amby, Dalby (UQIC, NMV). NEW SOUTH WALES: Woodenbong, Moree, Narrabri, Muswellbrook, Coonabarabran, Bellata, Cobar, Bathurst, Scone, Glen Innes, Goulbourn, Armidale (UQIC); Nyngan (UQIC, SAM); Wilcannia (SAM). AUSTRALIAN CAPITAL TERRITORY: Black Mt. (ANIC, UQIC). VICTORIA: Warracknabeal, Nowa Nowa (NMV). SOUTH AUSTRALIA: Ernabella Mission, Oodla Wirra, Oodnadatta, Curnamona HS, Middleback Range, Lake Gilles, Tomkinson Reserve, Kalamurina Stn, Murray R., Tusmore, Blanche Cup Spng, Amata, Cooper Ck, William Ck, Wild Horse Plains, Lake Palankarinna, Dog Lake, Billa Kalina HS, Coward Springs, Purni Bore, Pernatty Ck, Arthurton, Eyre Peninsula, Broughams Gate, Edeowie HS, Lembina HS, Terowie, Hamilton HS, Myrtle Springs, Monarto, Black Forest, Port Germein (SAM); Whyalla (WAM); Adelaide (UQIC, SAM, WAM). NORTHERN TERRITORY: Alice Springs, Aileron, Barrow Ck, Borroloola Rd junction with Stuart HWY, Simpsons Gap, Daly Waters, Glen Helen, Katherine, Ti-Tree, Tennant Ck (UQIC); Devils Marbles, Macdonald Downs, Ooratippra (CAS). WESTERN AUSTRALIA: Dandaragan, Murchison R. Xing, Merredin, Coolgardie, Gnowangerup, Margaret R. on Yallingup Rd, Derby, Broome Baandee (UQIC); Menzies, Langi Crossing (CAS); Onslow, Kimberley (SAM), Mitchell Plateau (ANIC); Sandfire Flat Roadhouse, Spring Ck on HWY 1 (NMV); Lake Cohen, Yeo Lake, Neale Junction, Mooka HS (WAM).

Diagnosis. A member of the '*urbanus*' species-group, most like *H. forrestae*; distinguished from other members of the genus by the following combination of characters: Female–labrum with two raised tubercles; frons coarsely reticulate; gastral tergum I with transverse rows of minute punctures; scutum impunctate anteriorly, remainder punctured, mesially open, posteriorly close, laterally sparsely (Fig. 10i). Male–dorsal surface of propodeum not defined by carinae; Fg:UID <2.0:1; EW:GW <2.5:1; frons reticulate; scutum sparsely punctured mesially and posteriorly; gastral tergum I punctate mesially.

Female. BL 4.4-5.4 mm (lectotype estimated c. 5.2 mm); FL 3.0-3.6 mm (lectotype c. 3.5 mm); head wider than long (60:50); eyes converging below, UID:LID as 36:32; clypeus slightly convex, width greater than twice length (28:12); antennal sockets separated by distance equal to diameter of socket. AOD:IAD:OAD:IOD:OOD as 13:4:19:12:9. Scape extending to level of anterior margin of median ocellus; EW:GW as 1.5:1; dorsolateral angle of pronotum projecting as small blunt spine; TS with two large apically blunt teeth and three quarters length of outer spur.

Sculpturing. Head roughened (Fig. 8c), frons coarsely reticulate; clypeus and supraclypeal area finely reticulate, clypeus close-openly punctured, supraclypeal area sparsely marked with minute hair pits; scutum (Fig. 10i) and scutellum reticulate, scutum anteriorly impunctate, mesially openly and posteriorly closely punctured, laterally and scutellum sparsely punctured; dorsal surface of propodeum (Fig. 12j) with areolate rugae mesially to rim, branched rugae laterally extending onto vertical surface; gastral tergum I with minute punctures mesially.

Colour. Frons green-blue or green; supraclypeal area and basal half of clypeus brass green, anterior half dark brown; scape and flagellum above dark brown, flagellum beneath light brown; scutum and scutellum blue-green or blue or green tinged with purple, red or gold; propodeum dark green; coxae, trochanters and basal two thirds of femora dark brown, apical one third of femora, fore tibiae and tarsi light red-brown, mid and hind tibiae and tarsi red-brown sometimes suffused with dark brown; gaster dark brown tinged with green.

Pubescence. Head sparsely covered with short, erect, minutely branched hair, anterior margin of clypeus with a few long, simple hairs; scutum and scutellum sparsely covered with short, inclined, minutely branched hair, posterior margin of scutellum with a few long, erect, minutely branched hairs; metanotum with both short, adpressed and long, erect, minutely branched hair; propodeum bare dorsally, vertical posterior surface sparsely covered with erect, minutely branched hair;

gastral tergum I almost bare mesially, a few short, simple hairs laterally, terga II and III with sparse complete cover of short, simple adpressed hair, remaining terga with both short, simple, adpressed and long, backwardly inclined, minutely branched hair.

Male. BL 3.3-4.6 mm; FL 2.6-3.6 mm; head wider than long (53:44); eyes converging strongly below, UID:LID as 32:21; scape not reaching level of median ocellus; Fg:UID as 1.7:1; EW:GW as 1.8:1. AOD:IAD:OAD:IOD:OOD distances as 8:5:17:11:7. BP complete, apically rounded; TS two thirds length of outer spur.

Sculpturing. Frons coarsely reticulate; clypeus and supraclypeal area finely reticulate, open-sparsely punctured; scutum reticulate, impunctate anteriorly, mesially sparsely punctured, laterally close-openly punctured; scutellum finely reticulate, shining, openly punctured; dorsal surface of propodeum with areolate rugulae, extending laterally onto vertical surface, mesially to rim; gastral tergum I with a few minute punctures mesially.

Colour. Head green tinged with gold, vertex sometimes blue; scutum and scutellum brass green sometimes tinged with purple, red or gold; propodeum blue; coxae, trochanters and basal two thirds of femora dark brown, remainder of femora, fore tibiae and tarsi light red-brown, mid tibiae and tarsi red- brown suffused with dark brown; gaster black or dark brown.

Pubescence. Frons with short, simple minutely branched hair on upper half, lower half of frons, paraocular areas, clypeus and supraclypeal area covered (not densely) with short, plumose, inclined hair; vertex with long, minutely branched hair, genae with long, branched hair; scutum and scutellum sparsely covered with short, erect, minutely branched hair, some long, erect, branched hair anterolaterally on scutum, along hind margin of scutellum and on metanotum; vertical surface of propodeum with short, minutely branched hair; gastral terga I, II and III with short, simple hair on lateral areas only, remaining terga with similar hair sparsely across entire surface.

Genitalia. Figs. 19g, h, i.
Gastral Sternum VI. Fig. 26i.

Remarks. Homalictus urbanus is the most prevalent species within this genus and is found in all parts of Australia, except Tasmania.

Descriptions of the ten synonymised species all note the similarities between each other and with *H. urbanus*, but are separated on varying colour characters. A few examples are as follows: (Females): *H. baudinensis*, "similar to *urbanus* but the tibiae, tarsi and apical one third of femora bright ferruginous"; *H. lomatiae*, "distinct species on account of the shining blue scutellum, but examination shows that the hind spur, sculpture of area of metathorax and scutellum, &c., are precisely as in *H. urbanus*"; *H. williamsi*, "known from *H. urbanus* by the colour of the mesothorax"; *H. subcarus*, "known from *H. pavonellus* by green mesothorax and clear red hind tibiae". (Males): *H. hackeriellus*, "like *kesteveni*, but head having a yellowish green tinge and mesothorax dull brassy"; *H. olivinus*, "easily known from *H. hackeriellus* by the red tibiae"; *H. microchalceus*, "may be compared with *H. hackeriellus* but distinguished by the colour of the legs".

Examination of over 2 000 specimens of this species demonstrated that intraspecific colour variation is high, even within members of the same population. One of the main colour differences used, was the fore tibial colour either reddish black or clear light red-brown. A female specimen from Alice Springs, Northern Territory (UQIC) had the left fore tibia red black and the right fore tibia light red-brown, showing that both colours are possible within one specimen, let alone the species.

Distribution. Australia, except Tasmania (Fig. 4a).

Homalictus woodsi (Cockerell)

Figures 2a; 6c; 9c; 11c; 13d-g; 24b

Halictus woodsi Cockerell, 1910: 229.–1929b: 2 (Cockerell's suggested synonymy of *H. behri* with *H. woodsi* is not recognised.).–1933: 324.

Halictus behri transvolans Cockerell, 1912: 385.–1933: 305, syn. nov.

Homalictus woodsi.–Michener, 1965: 181.

Homalictus transvolans.–Michener, 1965: 181.

Material examined.

Holotype ♀ of *Halictus woodsi*, Cooktown, Oct 1902, Turner Coll., 1910-7 (BMNH). When the holotype of *H. woodsi* was examined no locality label was attached to the specimen, only the Turner collection label and Cockerell's 'type' label. The holotype of *H. flindersi*, examined at the same time, had two locality labels, one as was given in the original description, the other: Cooktown, Oct 1902. I have assumed that at some time the locality label of *H. woodsi* has been accidentally attached to the *H. flindersi* holotype and have therefore mounted the label on a white card and re-attached it to the *H. woodsi* holotype.

Holotype ♀ of *Halictus behri transvolans*, Mackay, Mar 1900, 757, Turner Coll., 1912-111. (BMNH).

Other specimens examined: (31 ♀♀, 15 ♂♂) (PD: 1,6-7,9-12) (FR: *Eucalyptus, Eugenia, Melaleuca, Borreria*) QUEENSLAND: Warraber (Sue) Is., Mt Webb, Hope Vale Mission (ANIC); Cairns (QDPI); Moa (Banks) Is. (UQIC, SAM); Townsville (BMNH, UQIC). NORTHERN TERRITORY: Cape Crawford, Borradaile, Wessel Island, Horn Inlet (Sir Edward Pellow Group) (ANIC); Darwin (UQIC, BMNH, ANIC). WESTERN AUSTRALIA: Carson escarpement, Drysdale River (ANIC).

Diagnosis. A member of the '*flindersi*' species-group, most like *H. flindersi*; distinguished from other members of the genus by the following combination of characters: Female–dorsal surface of propodeum defined by carinae; BP incomplete; frons with granulate reticulation below ocelli (Fig. 6c). Male–dorsal surface of propodeum defined by carinae; BP incomplete; gastral tergum VI with a small median and large lateral tufts of erect hair (Fig. 24b).

Female. BL 5.9-6.8 mm (holotype c. 6.6 mm); FL 4.0-4.6 mm (holotype c. 4.5 mm); head wider than long (72:61); UID:LID as 39:35; clypeus twice as wide as long (33:15), convex, protruded; antennal sockets separated by distance greater than diameter of socket. AOD:IAD:OAD:IOD:OOD as 13:7:24:13:9. Scape barely reaching level of anterior margin of median ocellus; dorsolateral angle of pronotum projecting as a small blunt tubercle; dorsal surface of propodeum defined by carinae, longer than scutellum; TS with three blunt teeth and marginally shorter than outer spur; BP incomplete, only defined anteriorly.

Sculpturing. Head roughened, frons (Fig. 6c) beneath ocelli with granulate reticulation, lateral margins of frons with vertical striae continuing around eye, weak transverse striae in front of ocelli; clypeus and supraclypeal area finely reticulate, close-openly punctured; scutum (Fig. 9c) finely reticulate (dull sheen), sparsely punctured except openly in parapsidal areas and densely along posterior margin; dorsal surface of propodeum (Fig. 11c) with areolate rugae extending to margin.

Colour. Frons green; vertex, genae and propodeum dark blue, clypeus royal blue; scape black, flagellum dark brown above, red-brown beneath; scutum blue- green; trochanters, femora, tibiae and basal two thirds of basitarsi dark brown to black, remainder of tarsi light brown; gaster steel blue.

Pubescence. Frons, vertex, paraocular areas and supraclypeal area with short, erect, minutely branched hair; clypeus with a few long, forwardly directed, simple hairs; genae with a few long, erect, branched hairs; scutum with short, erect, minutely branched hair; scutellum almost bare, a few long, erect, branched hairs; dorsal surface of propodeum bare, vertical surface sparsely covered with long, erect, branched hair; gastral terga I, II and III almost bare, terga IV and V with increasing density of short, simple hair; gastral and femoral scopae well developed.

Male. BL 5.6-6.2 mm; FL 3.6-4.3 mm; head wider than long (72:61); eyes converging strongly below, UID:LID as 42:20; scape not reaching level of median ocellus; Fg:UID as 1.7:1. AOD:IAD:OAD:IOD:OOD as 11:9:22:13:9. BP incomplete, only defined anteriorly.

Sculpturing. Head roughened, frons with granulate reticulation above antennal bases, transverse striae below ocelli and vertical striae on lateral frons with striae continuing to posterior margin of eye; vertex with several transverse striae; clypeus and supraclypeal area reticulate, close-openly punctured; scutum dull, finely reticulate, sparsely punctured, except along margins of parapsidal lines and hind margin openly punctured; scutellum with few punctures; dorsal surface of propodeum defined by carinae, with areolate rugae extending to rim.

Colour. Frons, vertex, genae and propodeum dark blue; clypeus, supraclypeal area, scutum and scutellum dark green; coxae,

trochanters, and femora dark brown, anterior surface of tibiae light brown, posterior surface of tibiae, femora apically and tarsi light red brown; gaster steel blue, tergum VII red-brown.

Pubescence. Lower paraocular areas with dense, short, plumose hair; clypeus, supraclypeal area and around antennal bases with spaced, short, plumose hair; frons, vertex, genae, scutum and metanotum with erect, branched hair; gastral sterna II, III and IV with transverse row of short hair along posterior margins.

Genitalia. Figs. 13d, e, f, g.

Gastral Sternum VI. Fig. 24b.

Distribution. Northern Australia (Fig. 2a).

Quasilictus subgen. nov.

Diagnosis. Female – hind tibiae slender, scarcely concave beneath, ventral margin of anterior surface relatively straight, outer surface covered with short, minutely plumose, adpressed hair (Fig. 5m); apical two thirds of gastral tergum I covered with close-open punctation; gastral terga II, III, IV with tomentous bands of hair (absent mesially).

Male – middle flagellar segments as wide as long or wider than long; Fg:UID equal to or less than 1.0; TS pectinate; genitalia (Figs 23a-e) with gonobase continuing contours of gonocoxite yet broadly expanded to same width as gonocoxite; volsellae with large ventroapical projections (Fig. 23d); apical margin of gastral tergum VII broad and bilobed.

Type species. *Homalictus brevicornutus* sp. nov.

Remarks. Vestiture on hind tibiae of female allies *Quasilictus* with the New Guinea subgenus *Papualictus* (Michener 1980a: 8) but differs as follows: Male – clypeus less than five times width; mandibles not shifted posteriorly; mandibles not enormously enlarged, or sickle shaped; dorsolateral angle of pronotum not forming a large acute tooth; dorsal surface of propodeum not elevated to form shining, longitudinal elongate bosses.

Homalictus (Quasilictus) brevicornutus sp. nov.

Figures 2a; 5m; 8k; 10q; 12r; 23a-d; 27g

Material examined.

Holotype ♀, Paratypes 8 ♀♀, 4 ♂♂, Batten Point, 15°54'S., 136°32'E., 30 km NE. by E. of Borroloola, Northern Territory, 30 Oct 1975, M.S. Upton. (ANIC).

Other specimens examined: (1 ♂) (FR: Not recorded) WESTERN AUSTRALIA: 6 km W. of Martins Well, West Kimberly, 26 Apr 1977, D.H. Colless. (ANIC).

Diagnosis. Female. BL 5.5-6.2mm (holotype c. 6.2mm); FL 3.5-3.9mm (holotype c. 3.9 mm); head wider than long (73:56), eyes converging below, UID:LID as 44:38; clypeus more than twice as wide as long (32:12), protruding, slightly convex in profile; supraclypeal area convex; antennal sockets separated by distance greater than diameter of socket. AOD:IAD:OAD:IOD:OOD as 12:8:22:14:10. Scape reaching just short of level of anterior margin of median ocellus; first three flagellar segments wider than long, remaining segments as long as wide; dorsolateral angle of pronotum projecting as small rounded tubercle; TS slightly longer than outer spur, coarsely pectinate with four blunt teeth, diminishing in size distally, basal three large, distal tooth small; BP complete, apically rounded.

Sculpturing. Head roughened (Fig. 8k), frons coarsely granulate extending to level of anterior margin of rear ocelli, anterior lateral areas almost smooth; supraclypeal area densely punctured, interspaces between punctures smooth and polished, clypeus closely punctured along basal margin, remainder sparsely punctured, interspaces between punctures finely reticulate; vertex with several weak transverse striae, extending onto genae; scutum (Fig. 10q) anteromesially impunctate, finely reticulate, remainder dense-closely punctured, interspaces between punctures smooth and polished; scutellum densely punctured mesially, remainder openly punctured, interspaces between punctures smooth and polished; mesepisternum and metepisternum with irregular striae-reticulated pattern; dorsal surface of propodeum (Fig. 12r) defined by carinae, with areolate rugae; gastral terga close-openly punctured, except

basal one third of tergum I impunctate and fine transverse lineolation on posterior margin of terga.

Colour. Frons, vertex, genae, green-blue; supraclypeal area golden; clypeus brown; scape dark brown, flagellum brown above, red-brown beneath; scutum and scutellum blue-green with golden tinge; propodeum dark blue; legs brown to dark brown; gastral terga red-brown suffused with blue.

Pubescence. Frons, supraclypeal area and genae with short, minutely branched hair; vertex and clypeus with long, erect, minutely branched hair; lower paraocular areas with short, plumose, adpressed hair; scutum and scutellum with both short, simple, apicad directed hair and erect, minutely branched hair except anterior lateral corners of scutum covered with short, plumose, adpressed hair and posterior margin of scutellum with a few long, erect, branched hairs; metanotum covered with short, semi-erect, plumose hair mesially; propodeum bare dorsally except posterior lateral areas with short, branched hair, vertical surface sparsely covered with erect, minutely branched hair; gastral tergum I with short, minutely branched, adpressed hair mesially, incomplete bands of tomentum on terga II, III and IV, remainder with short, simple and minutely branched hair.

Male. BL 5.4-6.2 mm; FL 3.4-3.9 mm; head wider than long (67:55); eyes converging below, UID:LID as 41:31; clypeus slightly convex, more than twice as wide as long (28:12); antennal sockets separated by distance greater than diameter of socket. AOD:IAD:OAD:IOD:OOD as 10:8:19:13:11. Scape not reaching level of anterior margin of median ocellus; flagellum short, first four flagellar segments wider than long, remainder (except last) at least as wide as long; Fg:UID as 1.0:1; TS slightly shorter than outer spur, coarsely pectinate with three acute teeth; BP complete, bluntly angulate apically.

Sculpturing. Frons coarsely granulate; clypeus and supraclypeal area closely punctured, areas between punctures smooth and polished; scutum anteriorly impunctate and reticulate, remainder closely punctured with areas between punctures smooth and polished, parapsidal lines indistinct; scutellum smooth and shining, sparsely punctured except along midline densely punctured; dorsal surface of propodeum defined by carinae, with large, branched, interconnecting rugae; gastral tergum I closely punctured mesially, laterally smooth and shining, remainder of tergites punctate posteromesially only.

Colour. Frons, vertex, genae, supraclypeal area, metanotum and propodeum blue; basal half of clypeus blue-green, anterior half brown; scape and flagellum above dark brown, flagellum beneath light brown; scutum and scutellum dull dark green with a golden tinge; legs brown; gaster dark brown tinged with blue.

Pubescence. Frons, vertex and genae with erect, minutely branched hair; lower paraocular areas, supraclypeal area and clypeus with short, plumose, adpressed hair, a few long simple hairs along anterior margin of clypeus; scutum and scutellum with long, erect, simple hair, a few long, erect, branched hairs along posterior margin of scutellum; metanotum covered with short, semi-erect, plumose hair mesially; propodeum bare dorsally, vertical surface with erect, minutely branched hair; gastral terga with short, simple, adpressed hair, tomentous like hair on lateral margins of terga II, III and IV.

Genitalia. Figs. 23a-d.

Gastral Sternum VI. Fig. 27g.

Distribution. Northern Territory and northern Western Australia (Fig. 2a).

New combinations

Lasioglossum (Chilalictus) appositum
(Rayment) comb. nov.

Halictus erythrurus appositus Rayment, 1939: 281.
Homalictus appositus.–Michener, 1965: 179.

Material examined.
Holotype ♀, White Swamp, New South Wales (ANIC).

Remarks. The morphology of *L. appositum* is typical of *Lasioglossum (Chilalictus)* not *Homalictus*.

Lasioglossum (Chilalictus) purpureum (Rayment) comb.nov.

Halictus doweri purpureus Rayment, 1935: 695.
Homalictus purpureus.–Michener, 1965: 180.

Material examined.
Syntype ♀, Melbourne, Victoria, 3 Mar 1929, F.E. Wilson (ANIC).

Remarks. The morphology of *L. purpureum* is typical of *Lasioglossum (Chilalictus)* not *Homalictus*.

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Appendix 1

Characters used in the construction of a cladogram for *Homalictus*.
(Presumed plesiomorphic state is in square brackets [ ].)

Sexes	Apomorphic state	Plesiomorphic state
1. Female	Tergal scopae present	Tergal scopae absent
2. Female	Femoral scopae originating from ventral surface of femur	Femoral scopae originating from dorsal surface of femur
3. Both sexes	Galea with a comb of short spines along the distal margin	Galea with a comb of long spines opposite base of galeal palp
4. Female	Hind tibiae robust	Hind tibiae slender
5. Female	Outer surface of hind tibiae with area of short differentiated hair	Outer surface of hind tibiae without area of short differentiated hair
6. Both sexes	Both sexes subequal in body length	Female body length greater than male
7. Both sexes	Tomentum on gastral terga present	Tomentum on gastral terga absent
8. Male	Genitalia with gonobase as wide as gonocoxites	Genitalia with gonobase narrower than gonocoxites
9. Male	Genitalic volsellae with large ventroapical projections	Genitalic volsellae without large ventrapical projections
10. Male	Dorsal surface of propodeum elevated each side to form shining boss	Dorsal surface of propodeum not elevated
11. Male	Area above pleural signum elevated	Area above pleural signum not elevated
12. Male	Mesepisternum with transverse ridge behind fore coxae	Mesepisternum without transverse ridge behind fore coxae
13. Male	Genitalia with ventroapical processes on gonocoxites	Genitalia without ventroapical processes on gonocoxites
14. Male	Gastral sternum VI with small inverted 'v' projections	Gastral sternum VI smooth
15. Female	Labrum with two raised tubercles	Labrum without raised tubercles
16. Female	Medium tubercle of labrum defined by a carina	Medium tubercle of labrum not defined by a carina
17. Female	Contour of frons does not continue onto clypeus	Contour of frons continues onto clypeus
18. Both sexes	Dorsal surface of propodeum entirely defined by carinae	Dorsal surface of propodeum not defined by carinae
19. Male	Gastral sternum VI with thickened spines	Gastral sternum VI smooth
20. Both sexes	Basal margin of second submarginal cell obtusely bent	Basal margin of second submarginal cell straight
21. Female	Head and propodeum black	Head and propodeum non black metallic colour
22. Female	Fore basitarsal comb absent	[Fore basitarsal comb present]
23. Male	Genitalia with long gonostyli	Genitalia with short gonostyli
24. Male	Genae with long, branched hair	Genae bare
25. Male	Gonocoxal processes with long, simple, tapering setae	Gonocoxal processes without setae
26. Female	Body (except head) non-metallic light red-brown colour	Body metallic dark colour
27. Female	Dorsal surface of propodeum smooth	Dorsal surface of propodeum sculptured
28. Male	Gonocoxal arms of genitalia converging ventrally	Gonocoxal arms of genitalia absent

Appendix 1 (continued)

Sexes	Apomorphic state	Plesiomorphic state
29. Male	Gonocoxal arms of genitalia with long, distinctly shaped hairs	Gonocoxal arms of genitalia absent
30. Both sexes	Gastral tergum I pitted across tergite	Gastral tergum I impunctate
31. Female	Transverse plicae on scutum	Transverse plicae absent on scutum
32. Both sexes	HB incomplete	HB complete
33. Female	Transverse plicae on scutum (a) not meeting along midline; (b) meeting along midline	Transverse plicae absent on scutum
34. Female	Frons with vertical striae only below ocelli	Frons smooth
35. Female	Frons granulate only from below ocelli to level of antennal bases	Frons smooth
36. Female	Scutal punctation in parapsidal areas (a) close; (b) dense	Scutum punctation sparse in parapsidal areas
37. Male	Distal area of genitalic penis valves deeply furrowed	Distal area of genitalic penis valves rounded
38. Female	Scutal punctation mesially (a) open; (b) close; (c) dense	Scutum punctation sparse mesially
39. Male	Sternum VI with distinct hair tufts (a) medially only; (b) large medially, small laterally; (c) small medially, large laterally	Sternum VI without distinctive hair tufts
40. Male	Shape of hairs on gonocoxal arms (a) spiculate (Fig. 12g); (b) cultellate (Fig. 13l); (c) lanceolate (Fig. 13d); (d) spatulate (Fig. h); (e) hooked (Fig. 12k)	Gonocoxal arms without pubescence
41. Both sexes	Dorsolateral angle of pronotum projecting as erect lamellae	Dorsolateral angle of pronotum not projecting as erect lamellae
42. Both sexes	Tubercle at rear of vertex	Tubercle absent at rear of vertex
43. Male	TS pectinate	TS essentially simple
44. Female	Clypeus without lateral projections	Clypeus with small lateral projections
45. Male	Fg:UID >2.0:1	Fg:UID <2.0:1
46. Female	Clypeal width greater than 3× but less than 5× the length	Clypeal width less than 3× length
47. Female	BP apically rounded	BP apically pointed
48. Female	Frons entirely granulate	Frons smooth
49. Female	Malus of strigilis comb shaped	Malus of strigilis fan-shaped
50. Male	Clypeus concave anteromesially	Clypeus slightly convex anteromesially
51. Female	Frons above antennal bases with vertical striae	Frons smooth
52. Female	Scutum densely covered with short hair	Scutum sparsely covered with short hair
53. Female	Scutal punctation not due to impressed points	Scutum punctation due to impressed points
54. Female	Scutum with transverse furrows	Scutum without transverse furrows
55. Female	Scutal punctures with rim elevated	Scutal punctures without rim elevated
56. Female	Frons with vertical striae extending across the entire surface	Frons smooth

Appendix 1 (continued)

Sexes	Apomorphic state	Plesiomorphic state
57. Male	Gonocoxal process of genitalia with spines	Gonocoxal process of genitalia absent
58. Female	TS half length of outer spur	TS about same length as outer spur
59. Female	Dorsolateral angle of pronotum produced as a prominent acute spine	Dorsolateral angle of pronotum rounded
60. Both sexes	Body black colour	Body non black colour
61. Male	Apex of marginal cell not separated from wing margin	Apex of marginal separated from wing margin
62. Female	Propodeal sculpture minutely anastomosed	Propodeal sculpture reticulate
63. Female	Legs black or dark brown	Legs dark green
64. Female	Propodeal sculpture areolate to dorsal rim	Propodeal sculpture reticulate
65. Female	Gastral terga with hair bands	Gastral terga without hair bands
66. Female	Scape reaching level of posterior ocelli	Scape not reaching level of posterior ocelli
67. Male	Fore trochanters with long plumose hair	Fore trochanters almost bare
68. Male	Hind trochanters with long plumose hair	Hind trochanters almost bare
69. Male	Tarsal segments flanged (a) fore tarsi only; (b) all tarsi	Tarsal segments not flanged
70. Male	Metanotum with dense pubescence	Metanotum sparsely covered with hair
71. Male	Tarsal claws enlarged	Tarsal claws small
72. Male	Genal hairs form a beard	Genae sparsely covered with hair
73. Both sexes	Mid coxae red-brown	Mid coxae dark brown
74. Male	Forewing cell 1st Cu bare	Forewing cell 1st Cu with macrotrichia
75. Male	Gonostyli of genitalia triangular in side view	Gonostyli of genitalia rounded in side view
76. Female	Frons sculpture reticulate	Frons smooth
77. Female	Posterior vertical surface of propodeum with dense pubescence	Posterior vertical surface of propodeum almost bare
78. Female	Dorsal propodeal sculpture extending onto lateral surface	Dorsal propodeal sculpture reticulate
79. Male	Dorsal gonocoxal foramen of genitalia narrow	Dorsal gonocoxal foramen of genitalia wide
80. Both sexes	Gastral tergum I pitted mesially	Gastral tergum I impunctate
81. Female	Dorsal surface of propodeum defined posteriorly by a carina	Dorsal surface of propodeum not defined by a carina
82. Female	Anterior lateral corners of scutum with areolate sculpture	Anterior lateral corners of scutum reticulate
83. Male	EW:GW >3:1	EW:GW <3:1
84. Male	Fg:UID <1:1	Fg:UID >1:1
85. Male	Gonocoxites with apically recessed area of pubescence	Gonocoxites not recessed apically

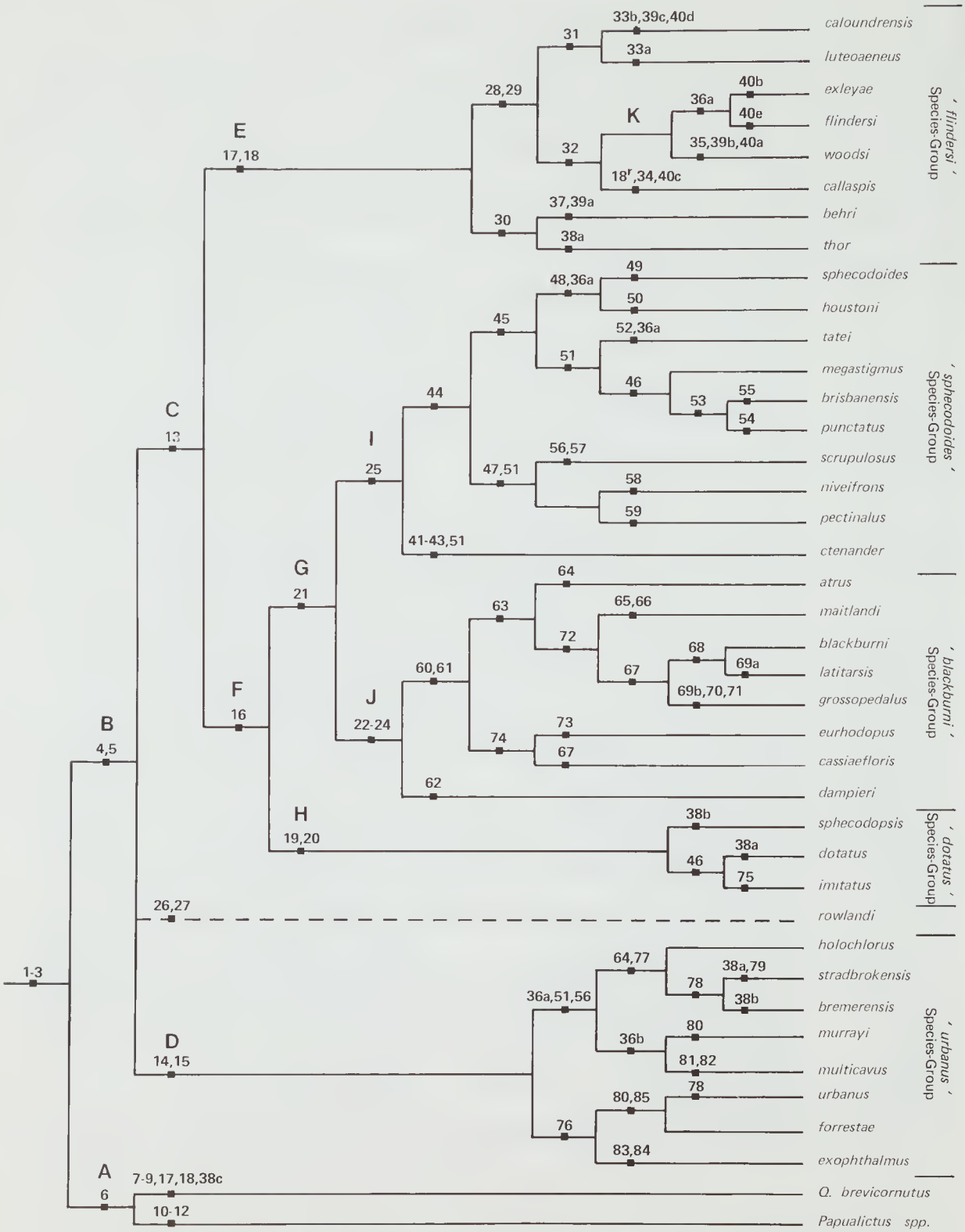

Figure 1. Cladogram illustrating hypothesized relationships among species of *Homalictus*. Numbers refer to apomorphic characters listed in Appendix 1. Letters refer to lineages as discussed in text. (r reversal)

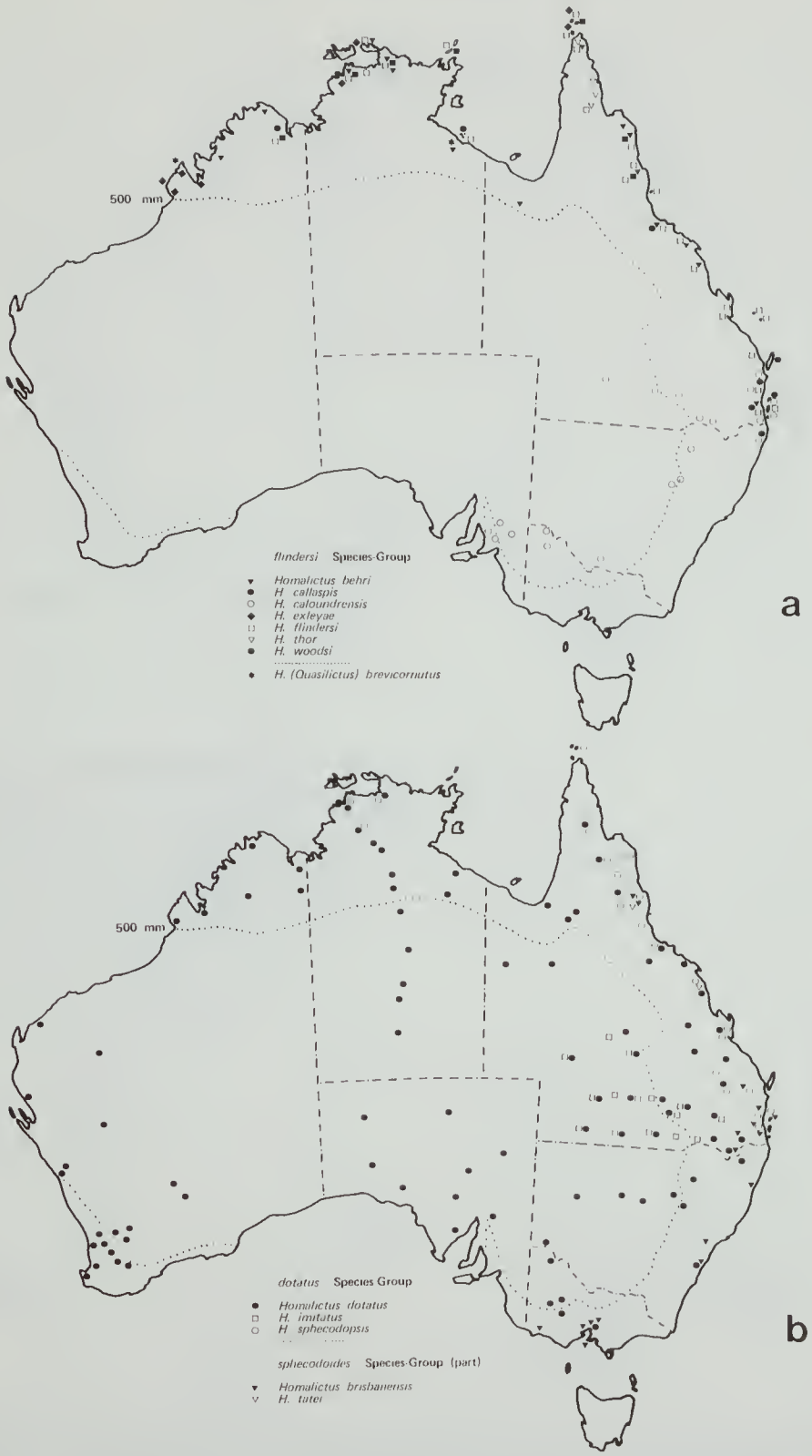

Figure 2. Distribution of *Homalictus* spp. a, '*flindersi*' species-group and *H. (Quasilictus) brevicornutus*; b, '*dotatus*' and '*sphecodoides*' (part) species-groups. 500 mm isohyet is shown.

Figure 3. Distribution of *Homalictus* spp. a, '*sphecodoides*' (part) species-group; b, '*blackburni*' species-group and *H. rowlandi*. 500 mm isohyet is shown.

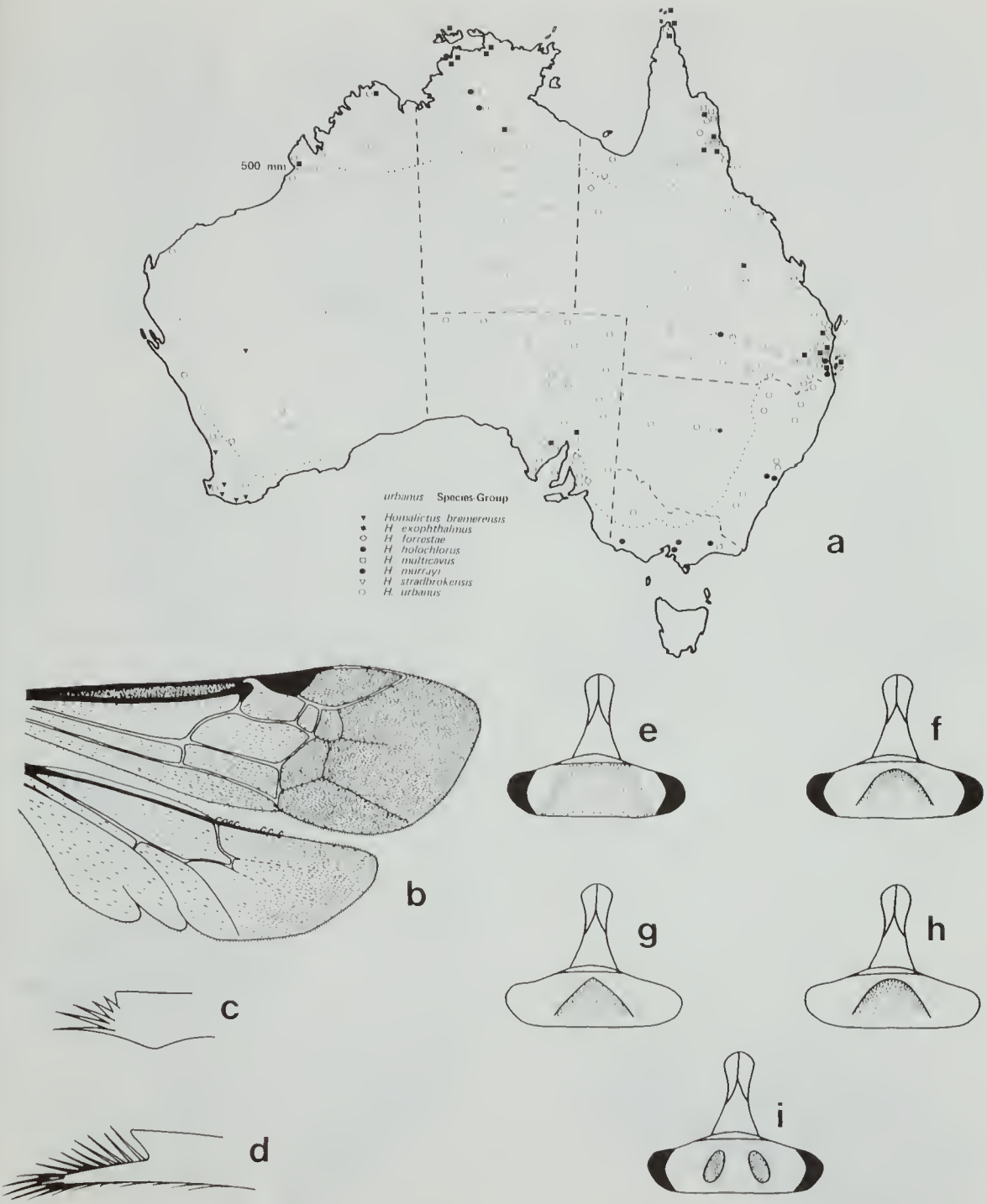

Figure 4. a, Distribution of '*Homalictus urbanus*' species-group. 500 mm isohyet is shown.

Diagrammatic views of: b, right fore and hind wing; c, malus of strigilis (fan-shaped), (lateral); d, malus of strigilis (comb-shaped, *H. sphecodoides*),(lateral).

Diagrammatic dorsal views of species-group labrums (solid black line in middle of basal box represents a carina): e, '*flindersi*' species-group; f, '*dotatus*' species-goup; g, '*sphecodoides*' species-group; h, '*blackburni*' species-group; i, '*urbanus*' species-group.

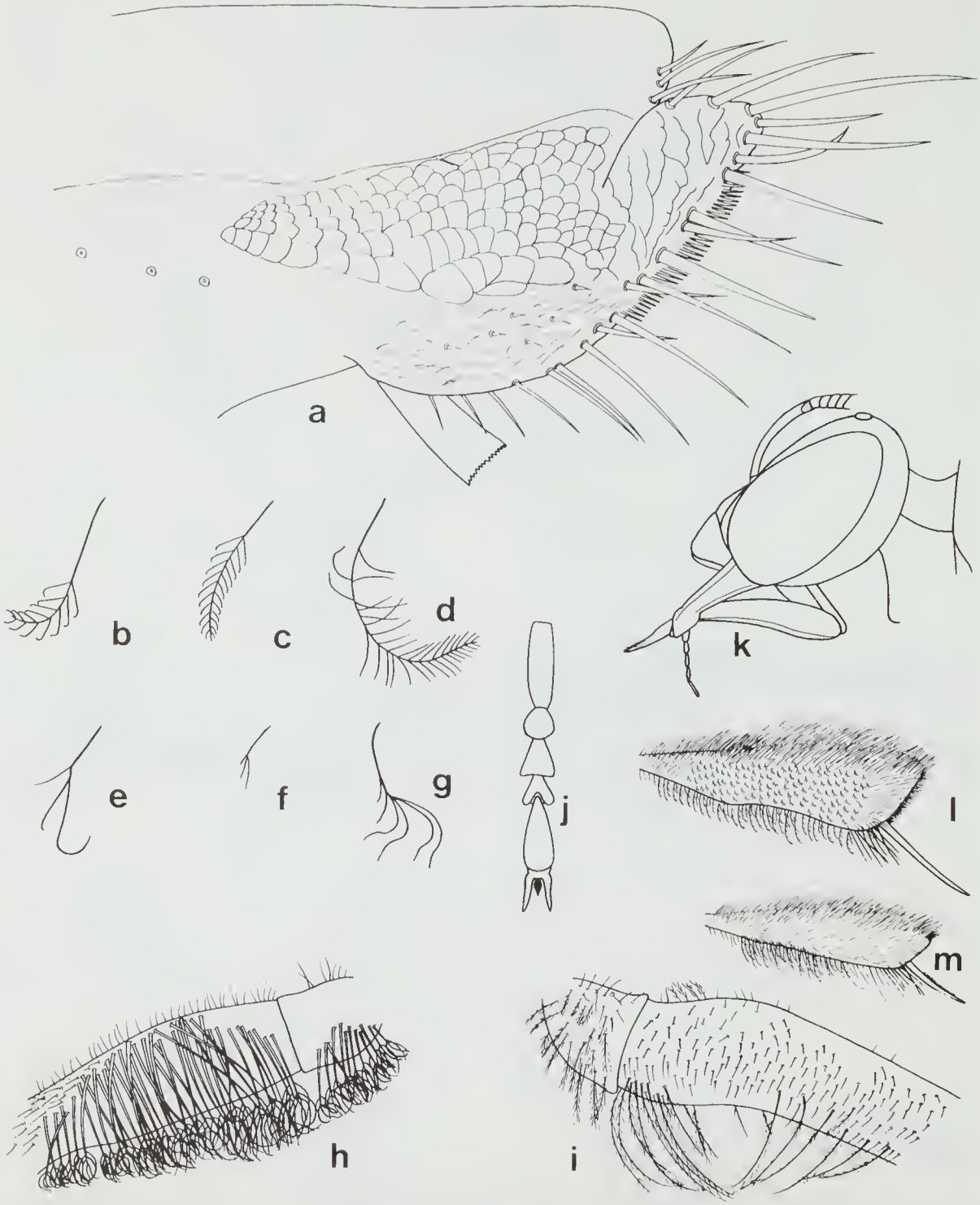

Figure 5. Diagrammatic views of: a, distal area of *Homalictus* sp. galea. b, c, d, sternal, femoral, tergal hairs of *Homalictus* spp.; e, f, g, same of *Lasioglossum* spp.; h, i, hind trochanter and femur showing position of scopal hair in *Lasioglossum* and *Homalictus*; j, fore tarsal segments of male *H. grossopedalus* (hair removed); k, head of female *H. exophthalmus* in side view.

Outer surface of female hind tibia: l, *H. calomadrensis*; m, *H. (Quasilictus) brevicornutus*.

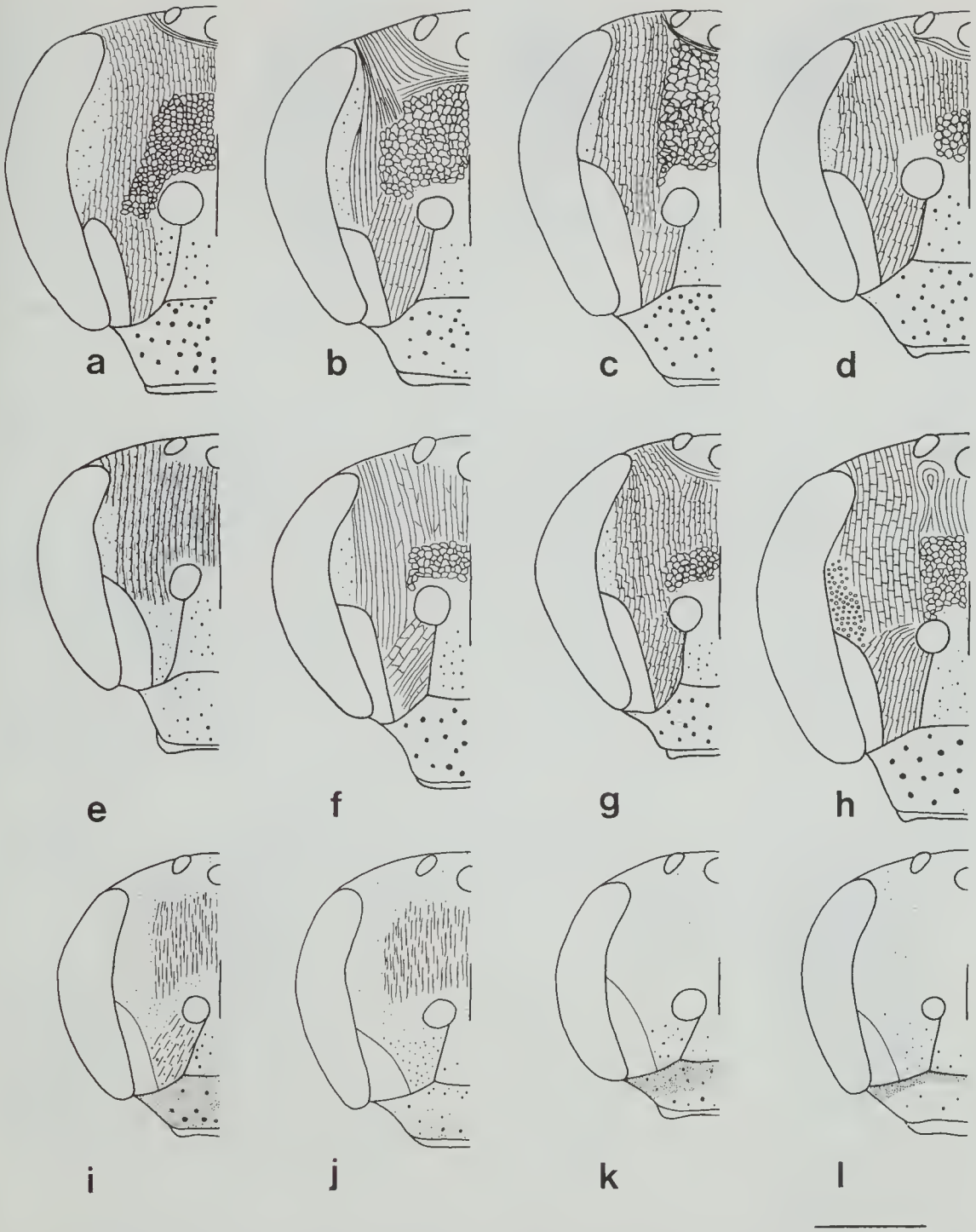

Figure 6. Sculpture on right half of female head (hair removed) of *H. (Homalictus)* spp. (Fine stippling represents reticulate sculpture, heavy spotting as punctures, paraocular area defined by solid line.) a, *H. thor*; b, *H. behri*; c, *H. woodsi*; d, *H. flindersi*; e, *H. callaspis*; f, *H. caloundrensis*; g, *H. exleyae*; h, *H. luteoaeneus*; i, *H. tatei*; j, *H. brisbanensis*; k, *H. sphecodopsis*; l, *H. dotatus*. Scale line equals 0.5 mm.

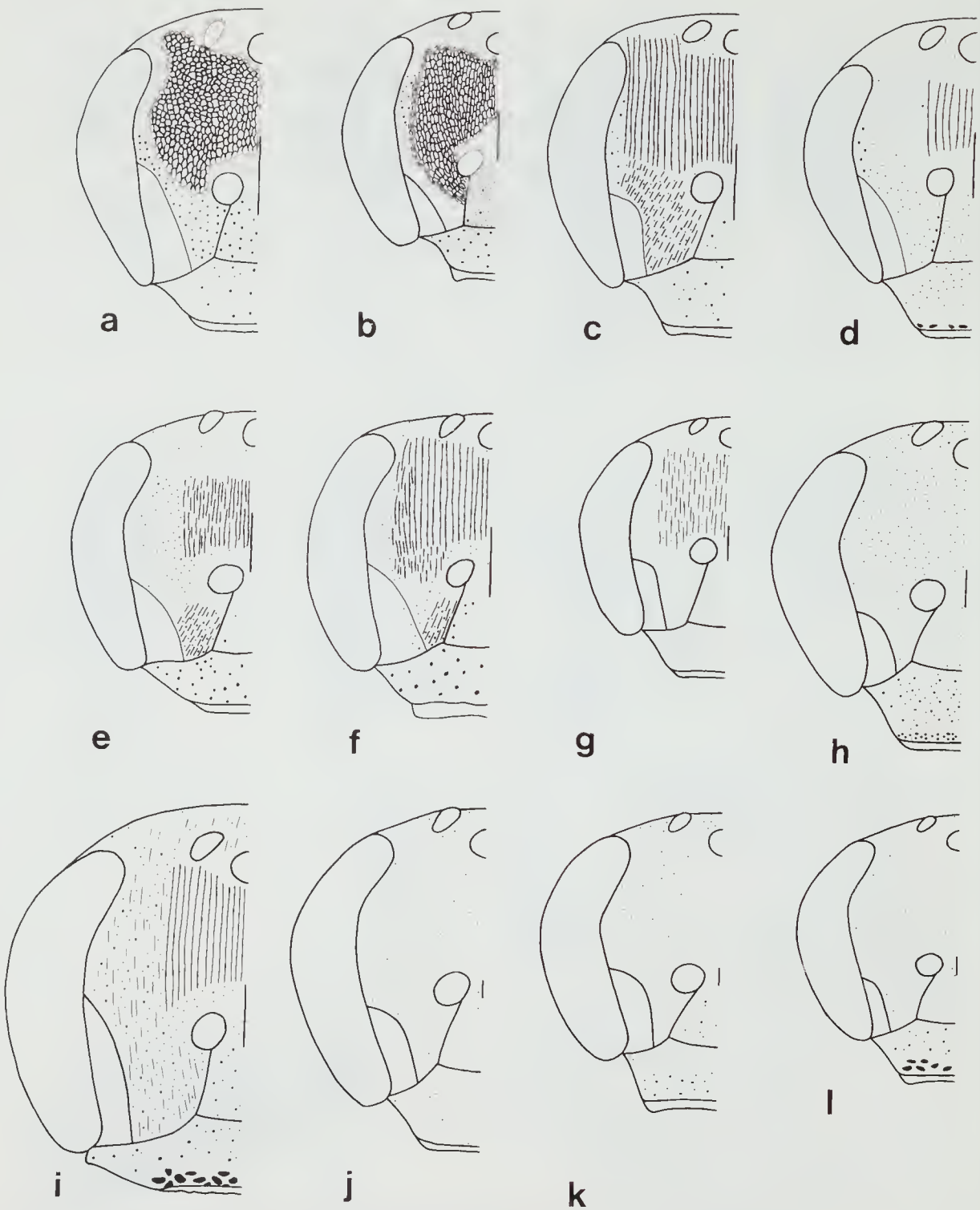

Figure 7. Sculpture on right half of female head (hair removed) of *H. (Homalictus)* spp. (Fine stippling represents reticulate sculpture, heavy spotting as punctures, paraocular area defined by solid line) a, *H. sphecodoides*; b, *H. houstoni*; c, *H. scrupulosus*; d, *H. niveifrons*; e, *H. megastigmus*; f, *H. punctatus*; g, *H. pectinalus*; h, *H. blackburni*; i, *H. ctenander*; j, *H. maitlandi*; k, *H. dampieri*; l, *H. eurhodopus*. Scale line equals 0.5 mm.

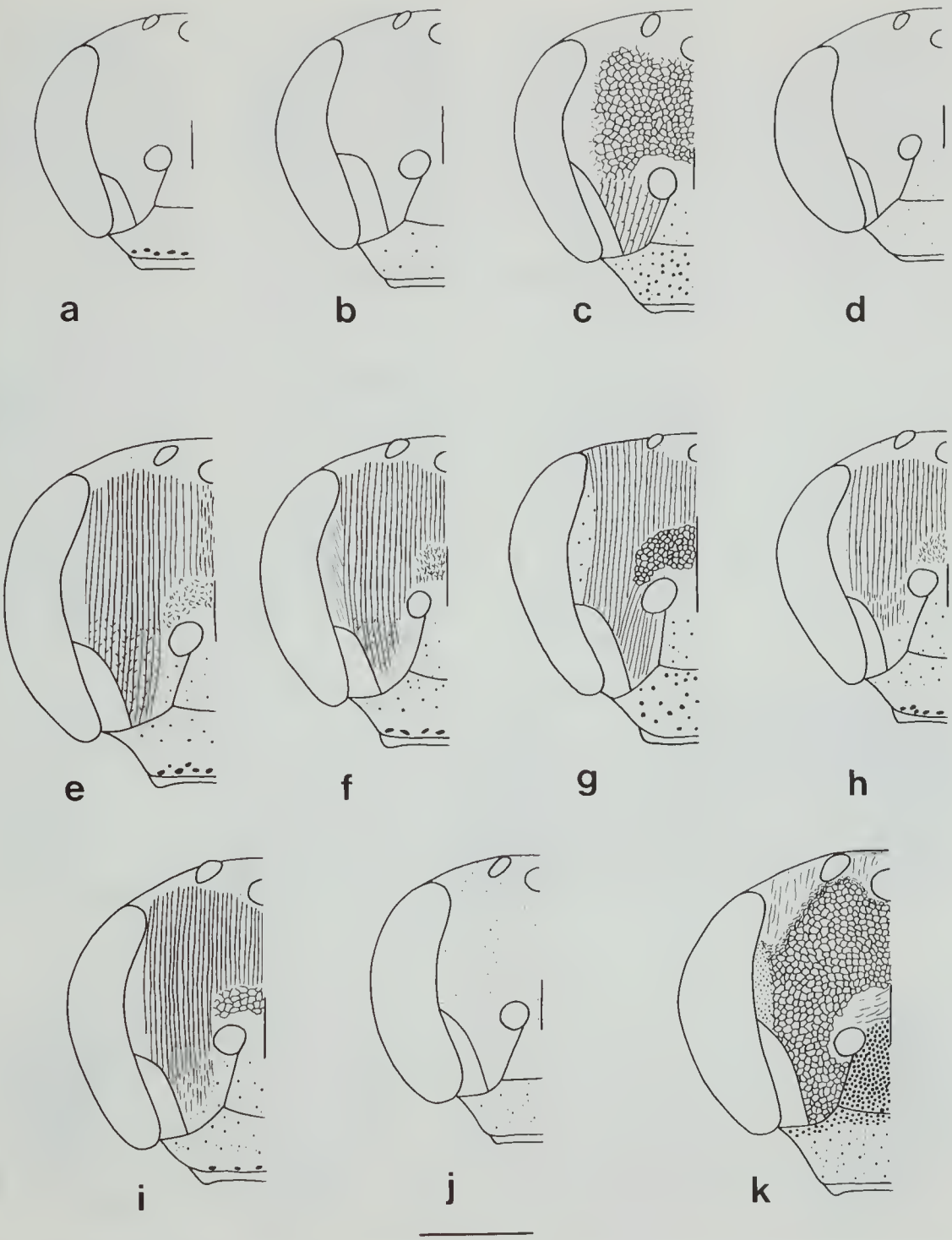

Figure 8. Seulpture on right half of female head (hair removed) of *H. (Homalictus)* spp. (Fine stippling represents retieulate seulpture, heavy spotting as punctures, paraocular area defined by solid line) a, *H. cassiaefloris*; b, *H. atrus*; c, *H. urbanus*; d, *H. exophthalmus*; e, *H. bremerensis*; f, *H. stradbrokensis*; g, *H. multicavus*; h, *H. murrayi*; i, *H. holochlorus*; j, *H. rowlandi*; k, *H. brevicornutus*. Scale line equals 0.5 mm.

N

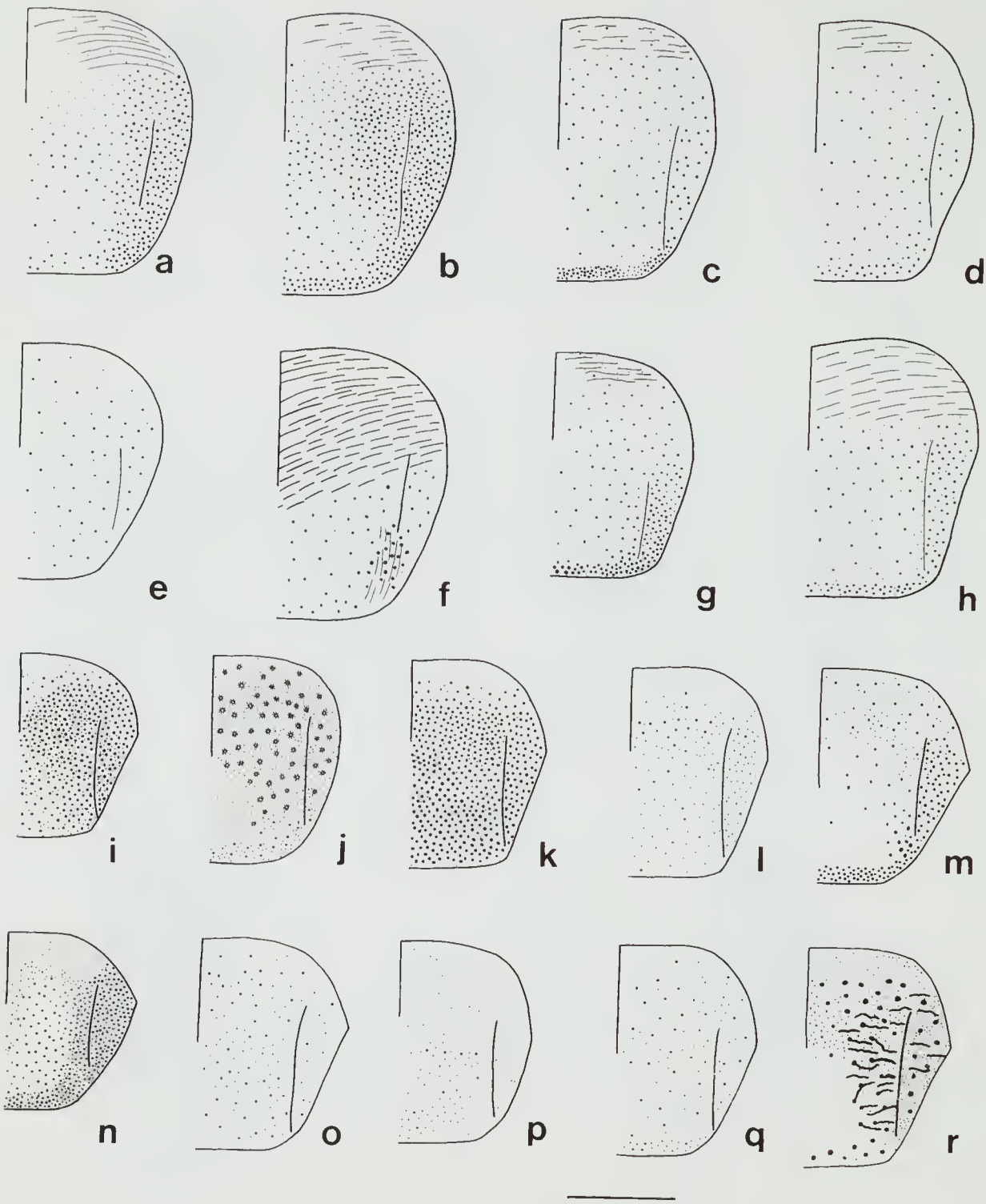

Figure 9. Sculpture on right half of female scutum (hair removed) of *H. (Homalictus)* spp. (Stippling indicates reticulate pattern) a, *H. behri*; b, *H. thor*; c, *H. woodsi*; d, *H. flindersi*; e, *H. callaspis*; f, *H. caloundrensis*; g, *H. exleyae*; h, *H. luteoaeneus*; i, *H. tatei*; j, *H. brisbanensis*; k, *H. sphecodopsis*; l, *H. dotatus*; m, *H. sphecodoides*; n, *H. houstoni*; o, *H. scrupulosus*; p, *H. niveifrons*; q, *H. megastiguus*; r, *H. punctatus*. Scale line equals 0.5 mm.

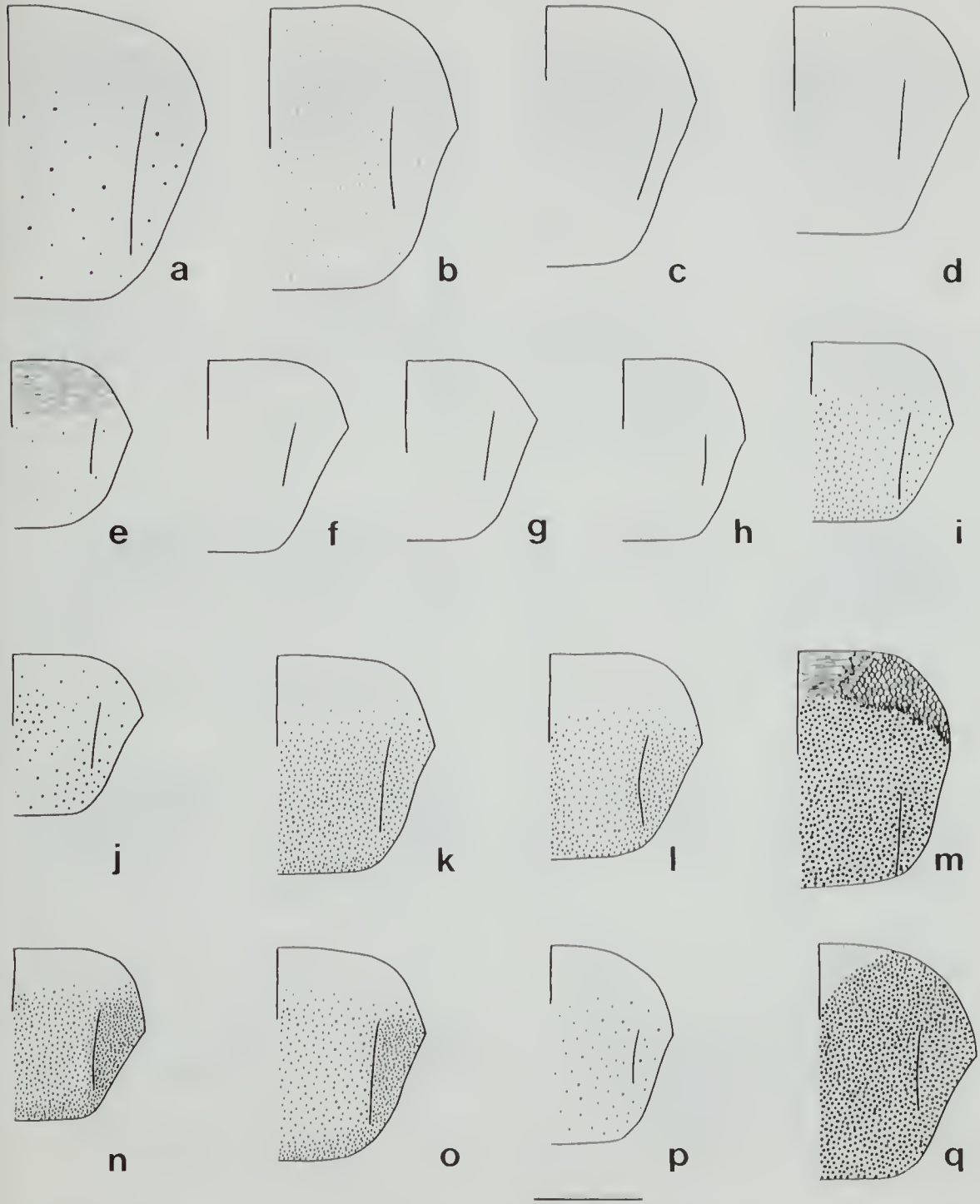

Figure 10. Sculpture on right half of female scutum (hair removed) of *H. (Homalictus)* spp. (Stippling indicates reticulate pattern) a, *H. ctenander*; b, *H. blackburni*; c, *H. mailandi*; d, *H. dampieri*; e, *H. pectinalus*; f, *H. eurhodopus*; g, *H. cassiaefloris*; h, *H. atrus*; i, *H. urbanus*; j, *H. exophthalmus*; k, *H. bremerensis*; l, *H. stradbrokensis*; m, *H. multicavus*; n, *H murrayi*; o, *H. holochlorus*; p, *H. rowlandi*; q, *H. brevicornutus*. Scale line equals 0.5 mm.

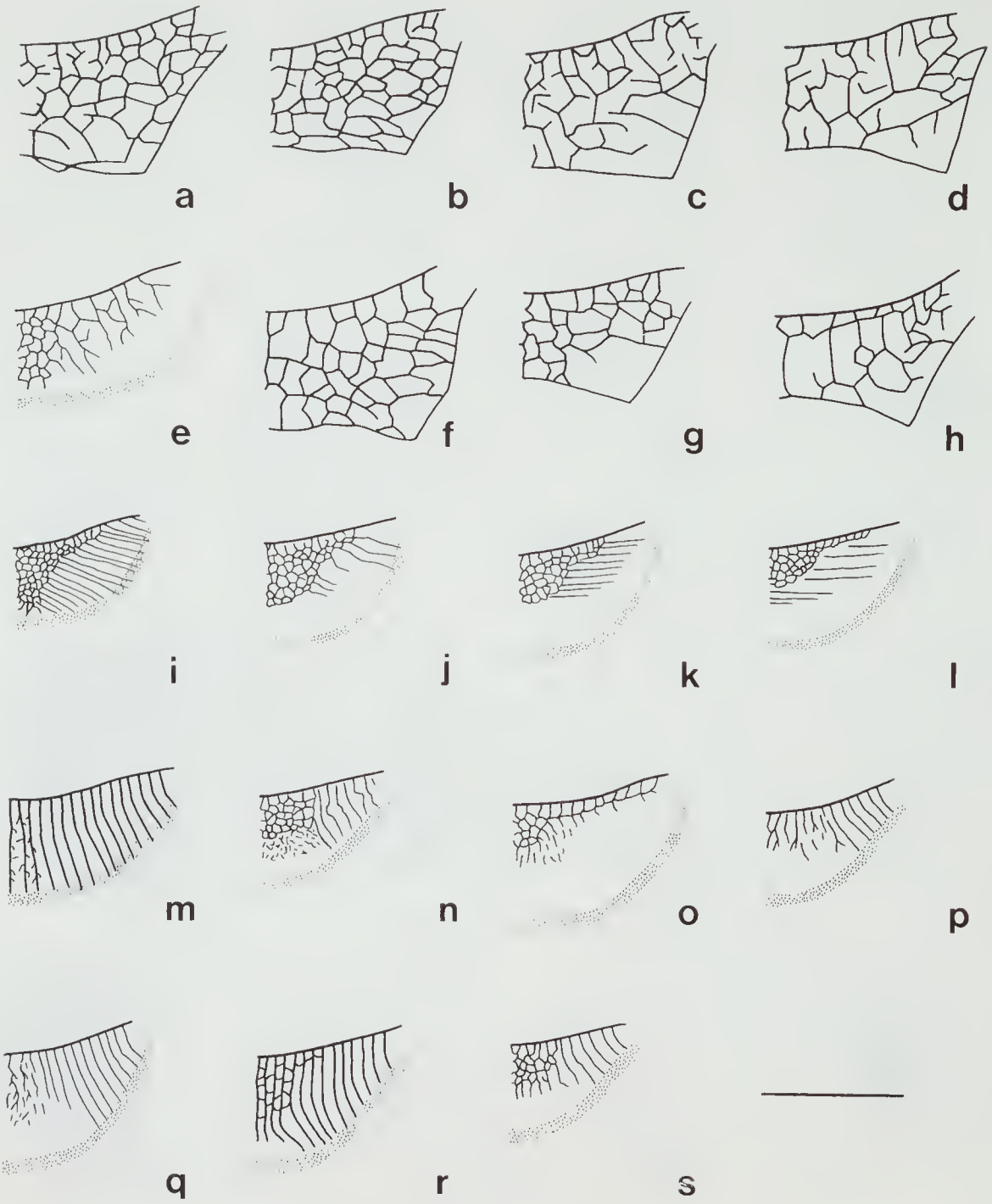

Figure 11. Sculpturing on right half of female dorsal surface of propodeum (hair removed) of *H. (Homalictus)* spp. a, *H. thor*; b, *H. behri*; c, *H. woodsi*; d, *H. flindersi*; e, *H. callaspis*; f, *H. caloundrensis*; g, *H. exleyae*; h, *H. luteoaeneus*; i, *H. tatei*; j, *H. brisbanensis*; k, *H. sphecodopsis*; l, *H. dotatus*; m, *H. sphecodoides*; n, *H. houstoni*; o, *H. scrupulosus*; p, *H. niveifrons*; q, *H. megastigmus*; r, *H. punctatus*; s, *H. pectinalus*. Scale line equals 0.5 mm.

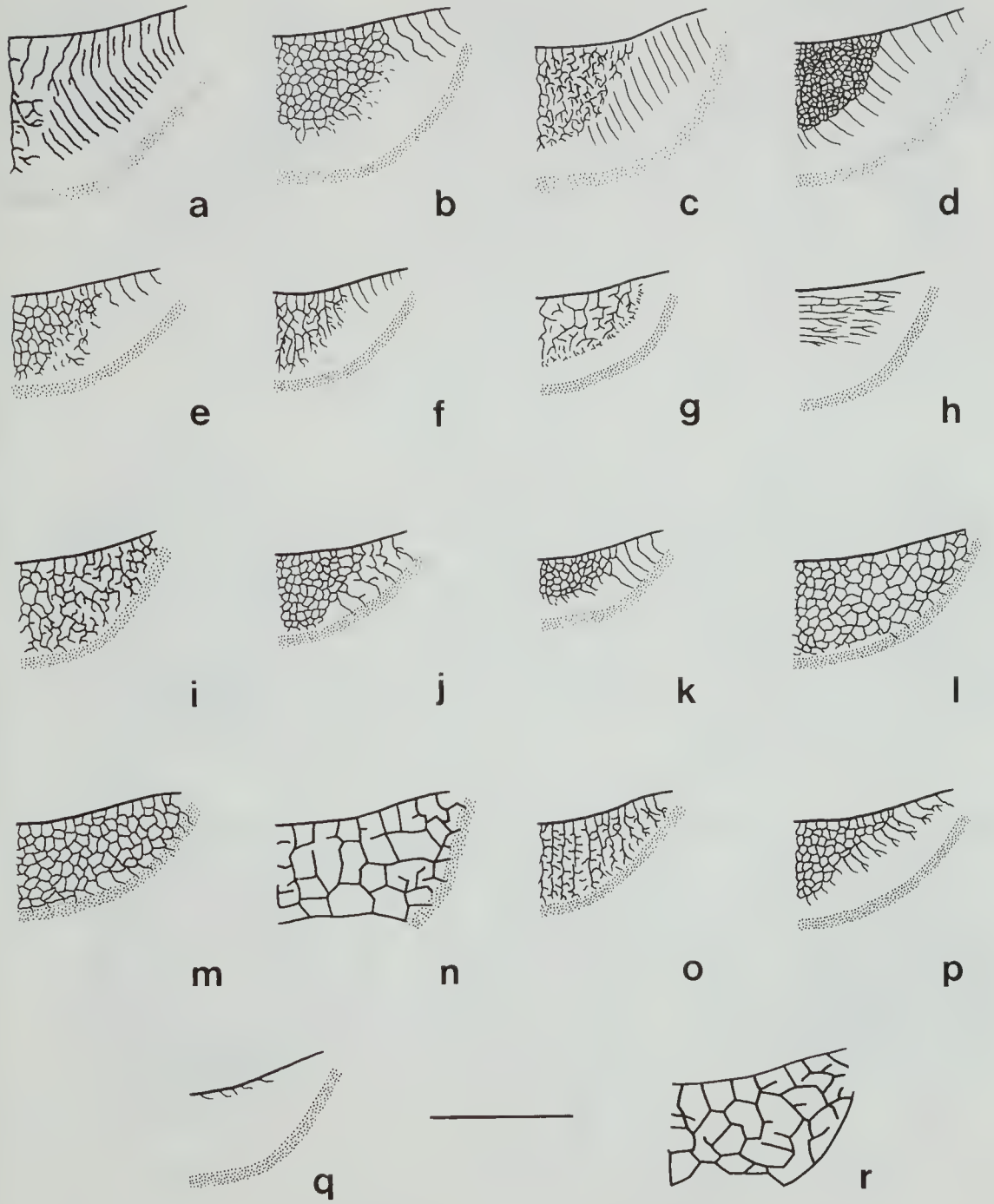

Figure 12. Sculpturing on right half of female dorsal surface of propodeum (hair removed) of *H. (Homalictus)* spp. a, *H. ctenander*; b, *H. blackburni*; c, *H. maitlandi*; d, *H. dampieri*; e, *H. eurhodopus*; f, *H. cassiaefloris*; g, *H. latitarsis*; h, *H. grossopedalus*; i, *H. atrus*; j, *H. urbanus*; k, *H. exophthalmus*; l, *H. bremerensis*; m, *H. stradbrokensis*; n, *H. multicavus*; o, *H. murrayi*; p, *H. holochlorus*; q, *H. rowlandi*; r, *H. brevicornutus*. Scale line equals 0.5mm.

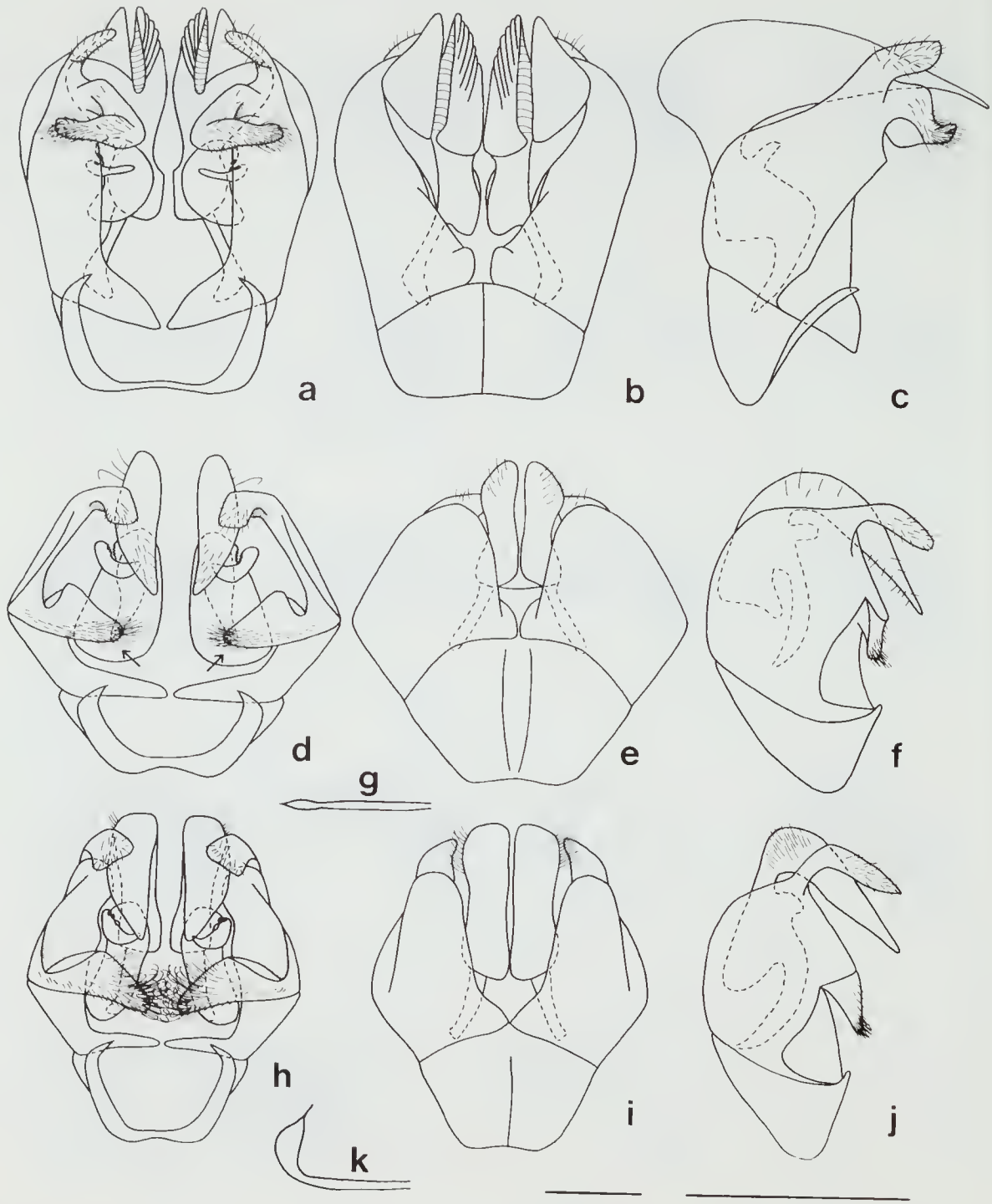

Figure 13. Ventral, dorsal and lateral views of male genitalia of *H. (Homalictus)* spp. plus enlargement of a hair from distal end of a gonocoxal arm (arrowed in d) (no enlargement for *H. behri*). a, b, c, *H. behri*; d, e, f, g, *H. woodsi*; h, i, j, k, *H. flindersi*. Small scale line equals 0.05 mm and refers to Figs. g and k only. Large scale line equals 0.5 mm and refers to remainder.

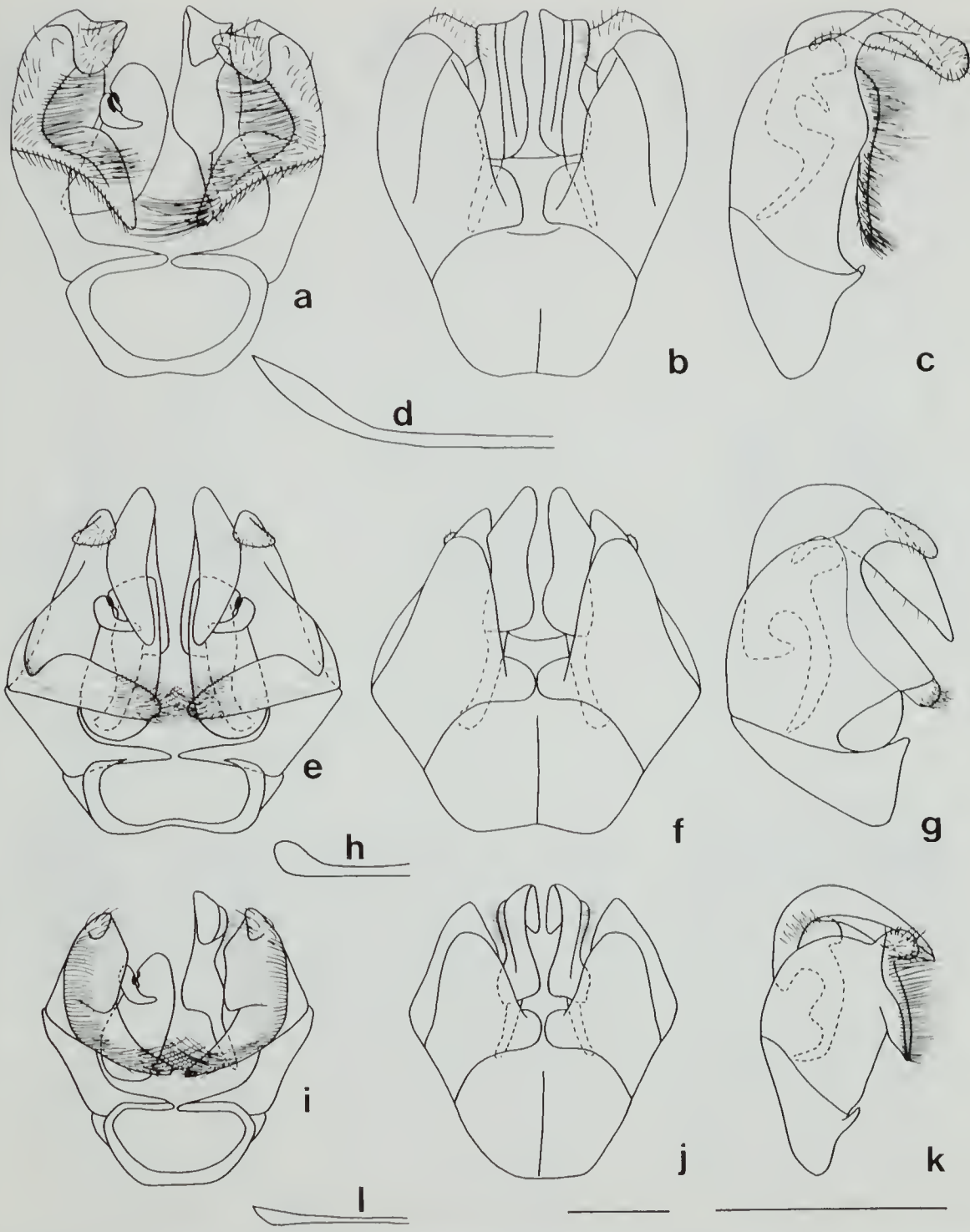

Figure 14. Ventral, dorsal and lateral views of male genitalia of *H. (Homalictus)* spp. plus enlargement of a hair from distal end of a gonocoxal arm. a, b, c, d, *H. callaspis*; e, f, g, h, *H. caloundrensis*; i, j, k, l, *H. exleyae*. Small scale line equals 0.05 mm and refers to Figs.d, h and l only. Large scale line equals 0.5 mm and refers to remainder.

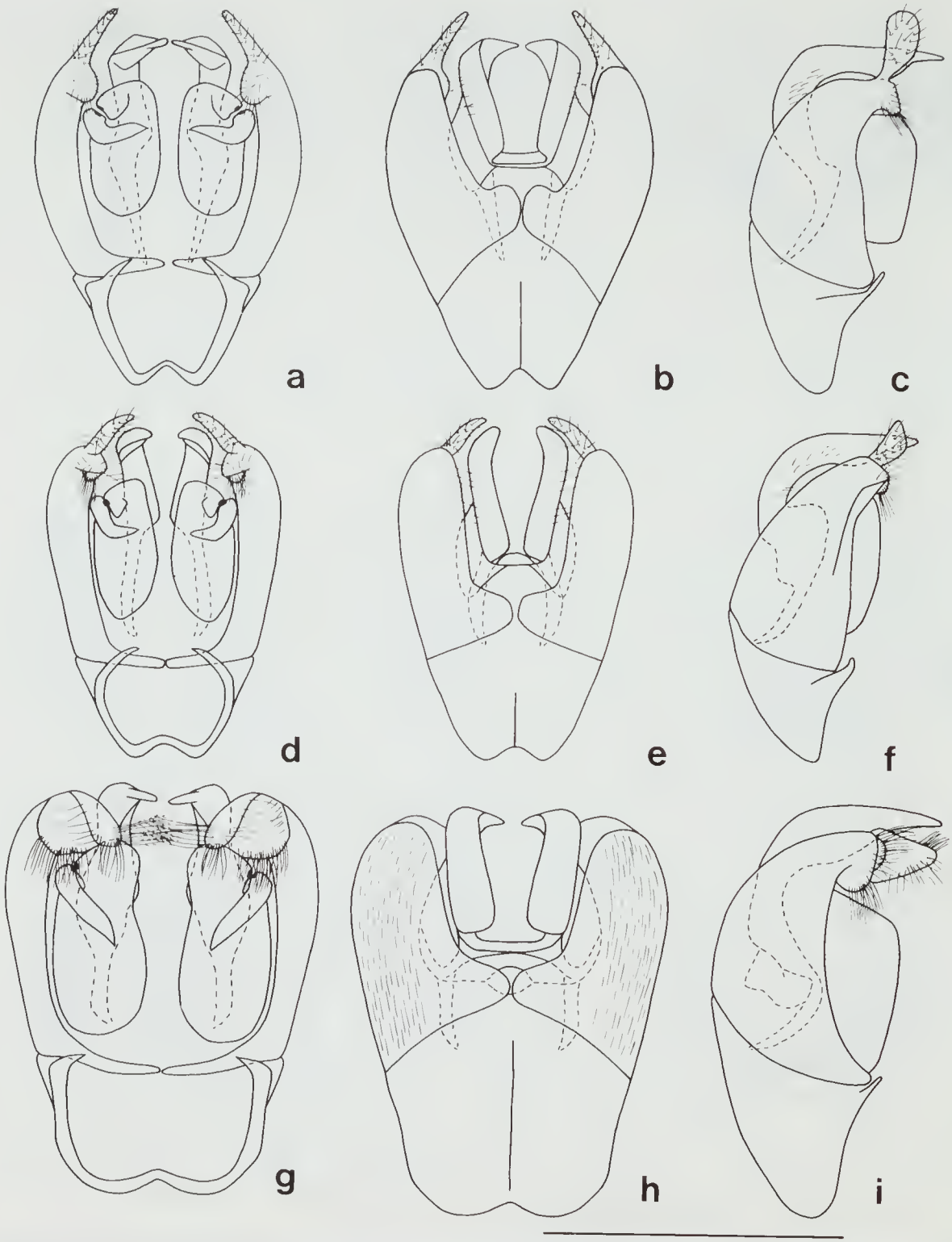

Figure 15. Ventral, dorsal and lateral views of male genitalia of *H. (Homalictus)* spp. a, b, c, *H. sphecodopsis*; d, e, f, *H. dotatus*; g, h, i, *H. imitatus*. Scale line equals 0.5 mm.

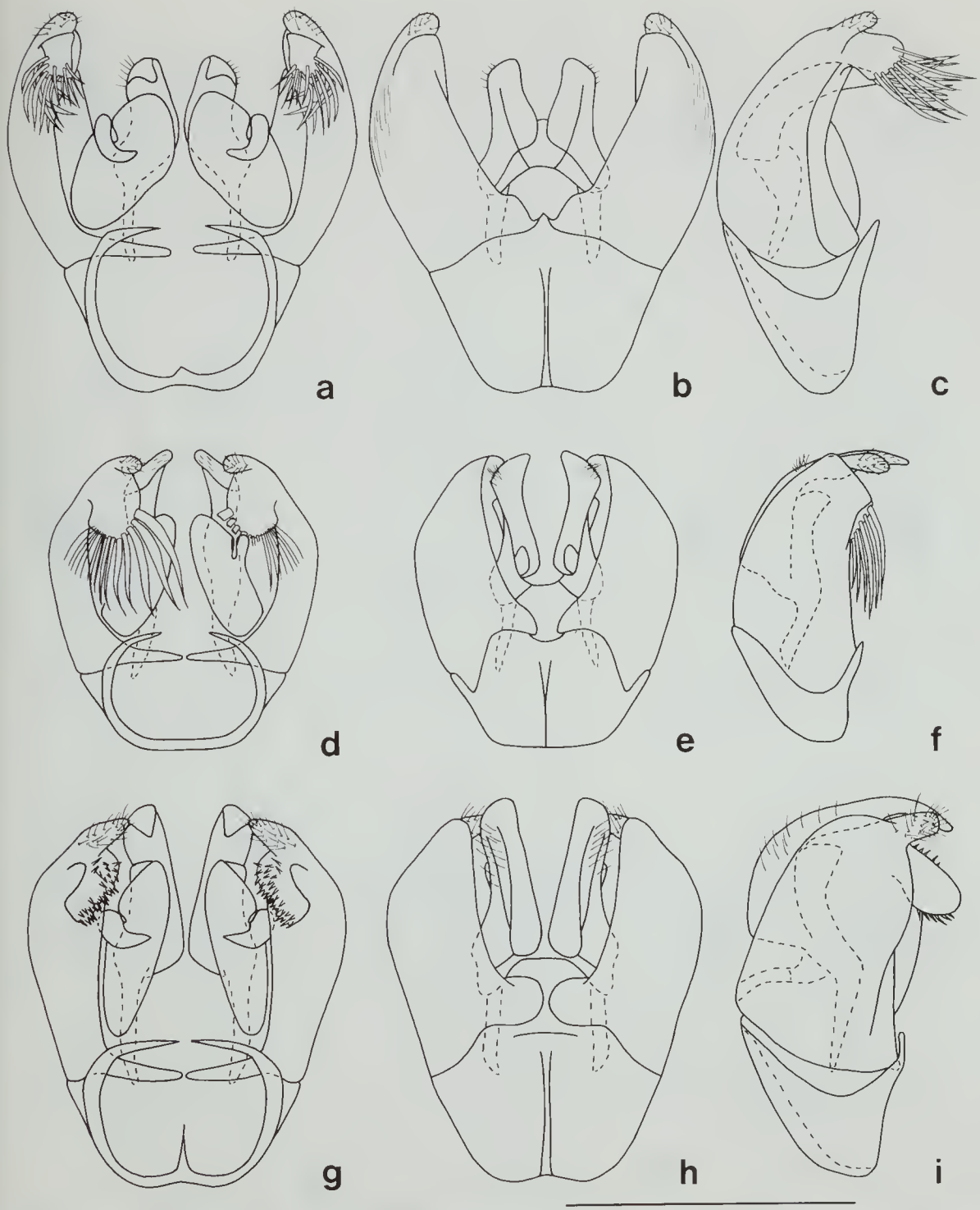

Figure 16. Ventral, dorsal and lateral views of male genitalia of *H. (Homalictus)* spp. a, b, c, *H. sphecodoides*; d, e, f, *H. houstoni*; g,h, i, *H. scrupulosus*. Scale line equals 0.5 mm.

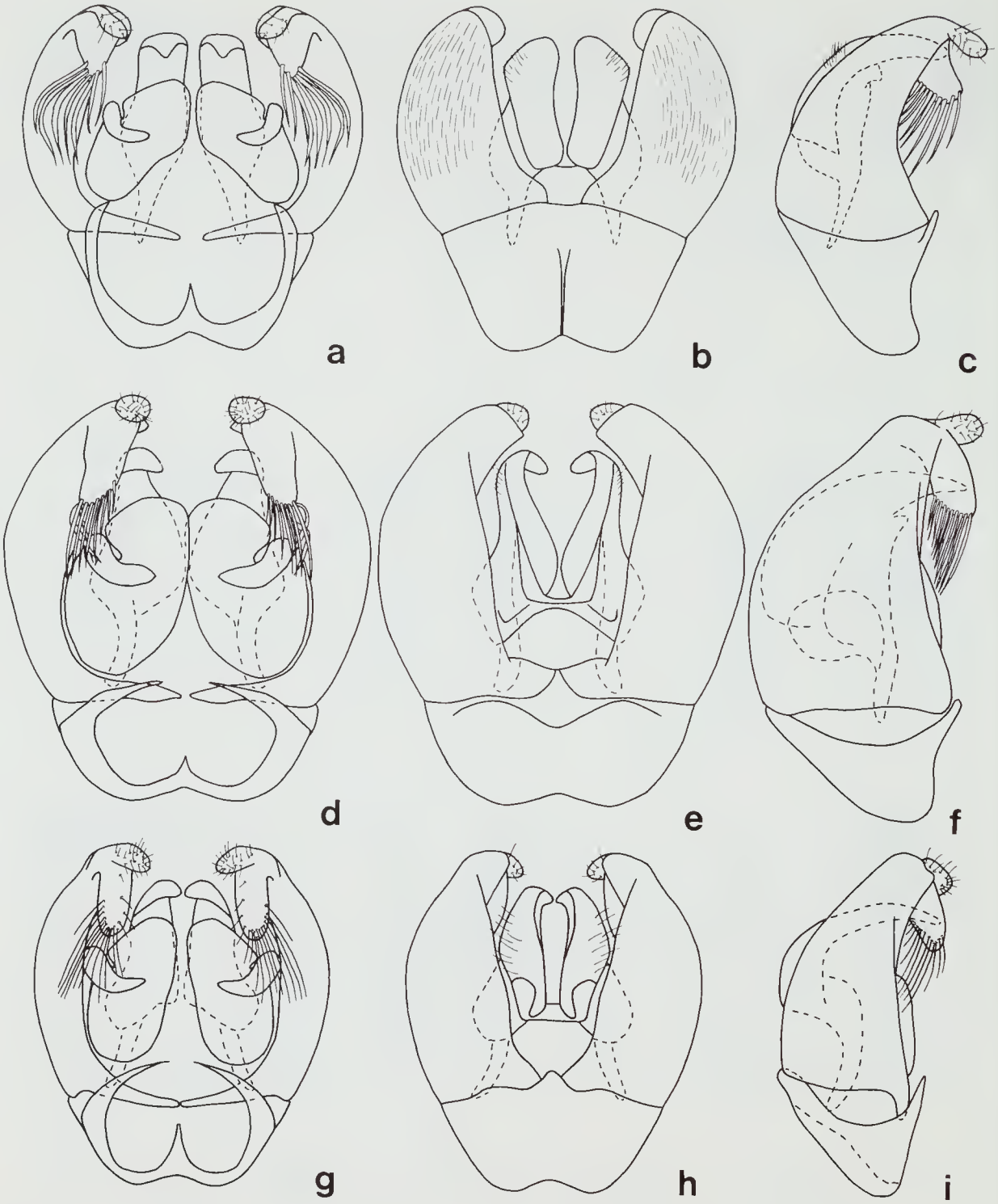

Figure 17. Ventral, dorsal and lateral views of male genitalia of *H. (Homalictus)* spp. a, b, c, *H. niveifrons*; d, e, f, *H. megastigmus*; g, h, i, *H. punctatus*. Scale line equals 0.5 mm.

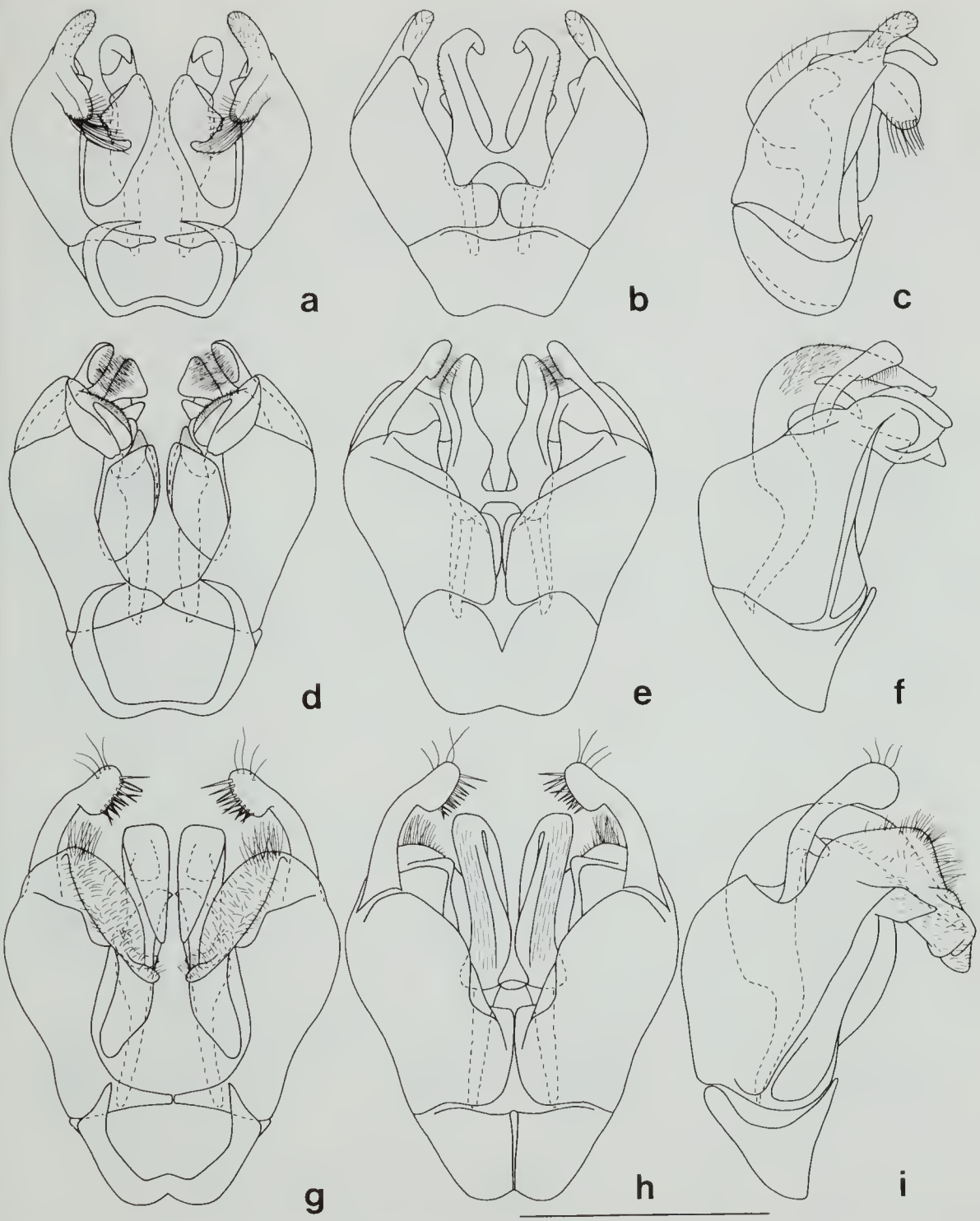

Figure 18. Ventral, dorsal and latcral views of male genitalia of *H. (Homalictus)* spp. a, b, c, *H. ctenander*; d, e, f, *H. blackburni*; g, h, i, *H. dampieri*. Scale line equals 0.5 mm.

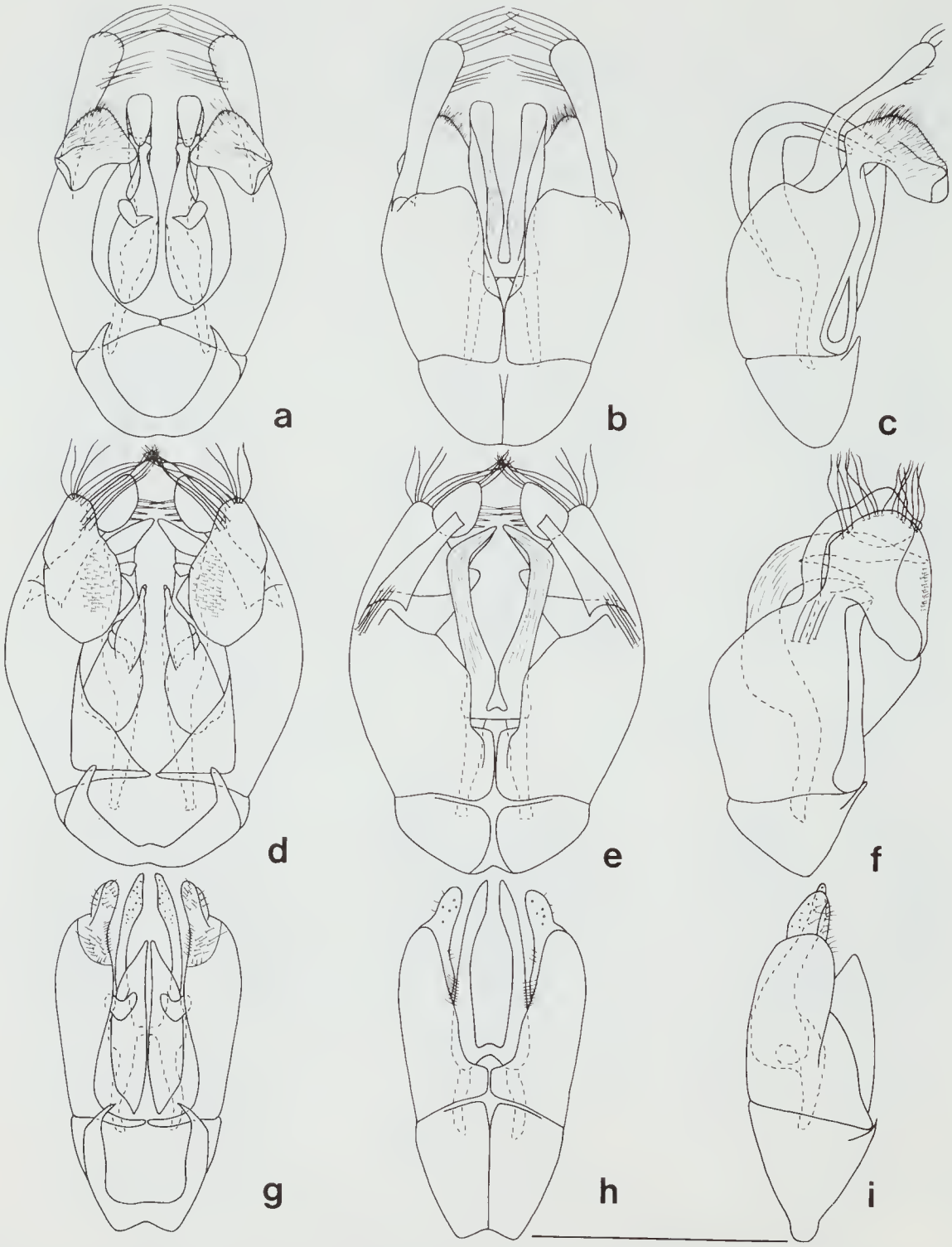

Figure 19. Ventral, dorsal and lateral views of male genitalia of *H. (Homalictus)* spp. a, b, c, *H. eurhodopus*; d, e, f, *H. cassiaefloris*; g, h, i, *H. urbanus*. Scale line equals 0.5 mm.

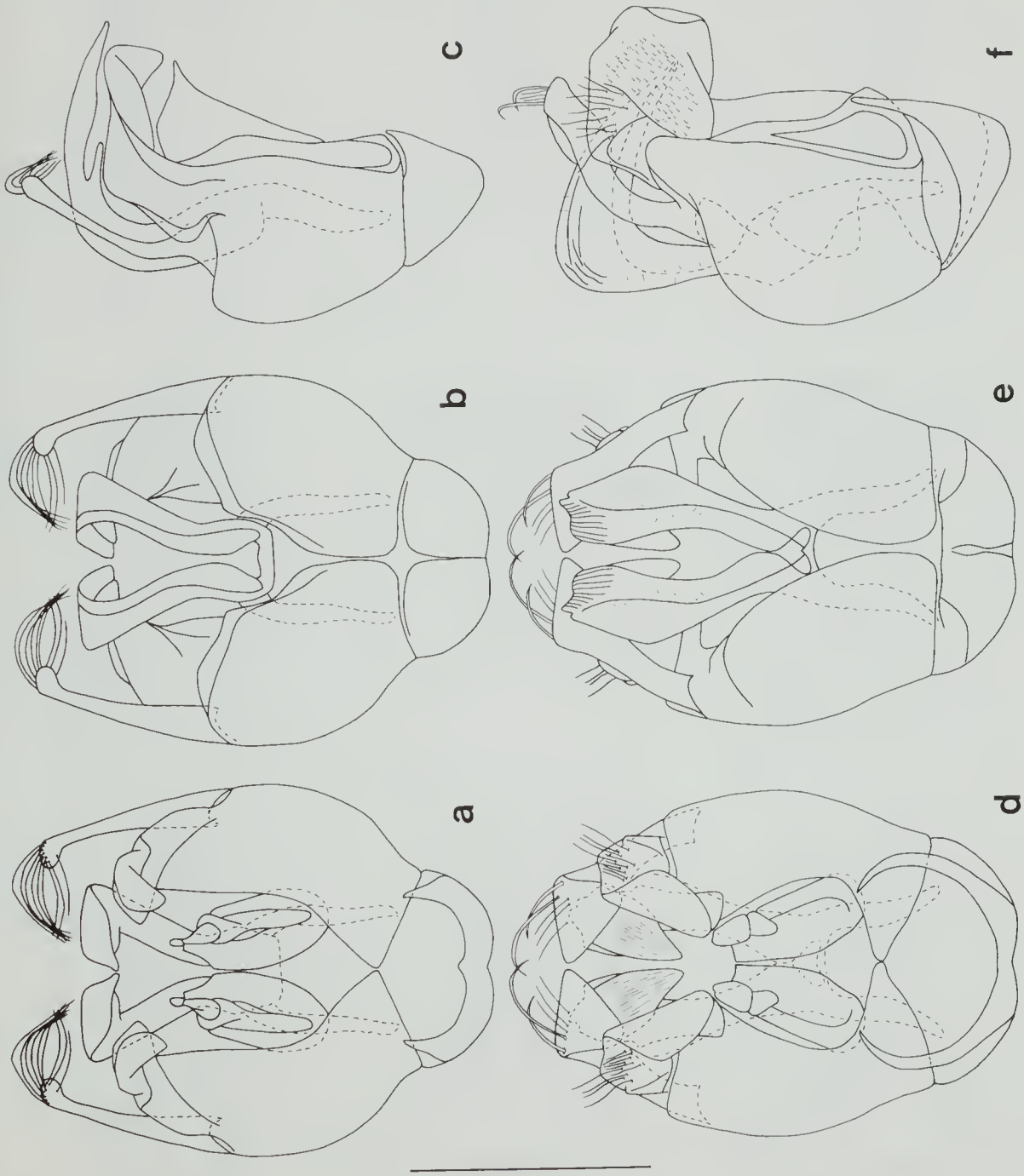

Figure 20. Ventral, dorsal and lateral views of male genitalia of *H. (Homalictus)* spp. a, b, c, *H. latitarsis*; d, e, f, *H. grossopedalus*. Scale line equals 0.5 mm.

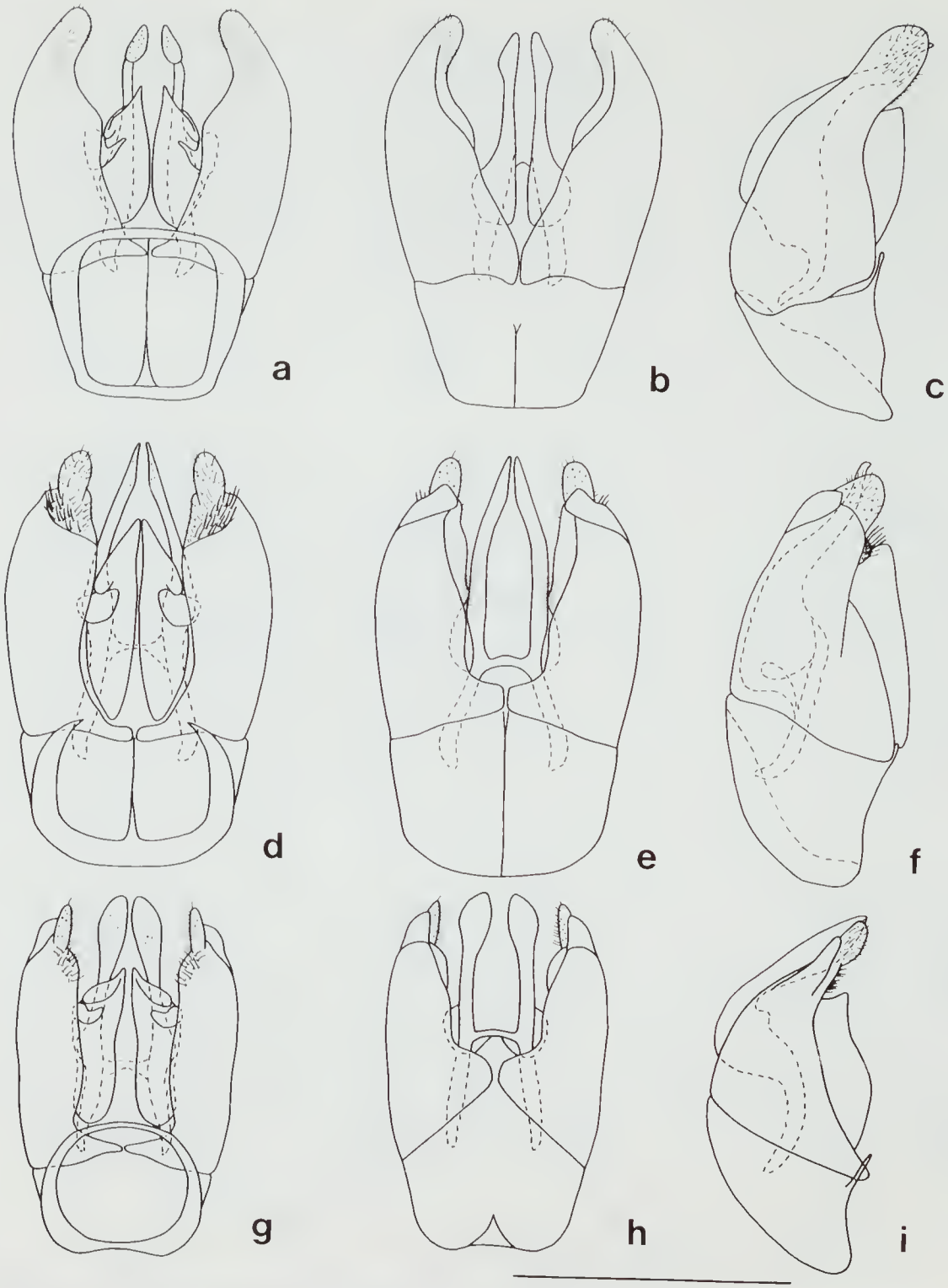

Figure 21. Ventral, dorsal and lateral views of male genitalia of *H. (Homalictus)* spp. a, b, c, *H. exophthalmus*; d, e, f, *H. forrestae*; g, h, i, *H. bremerensis*. Scale line equals 0.5 mm.

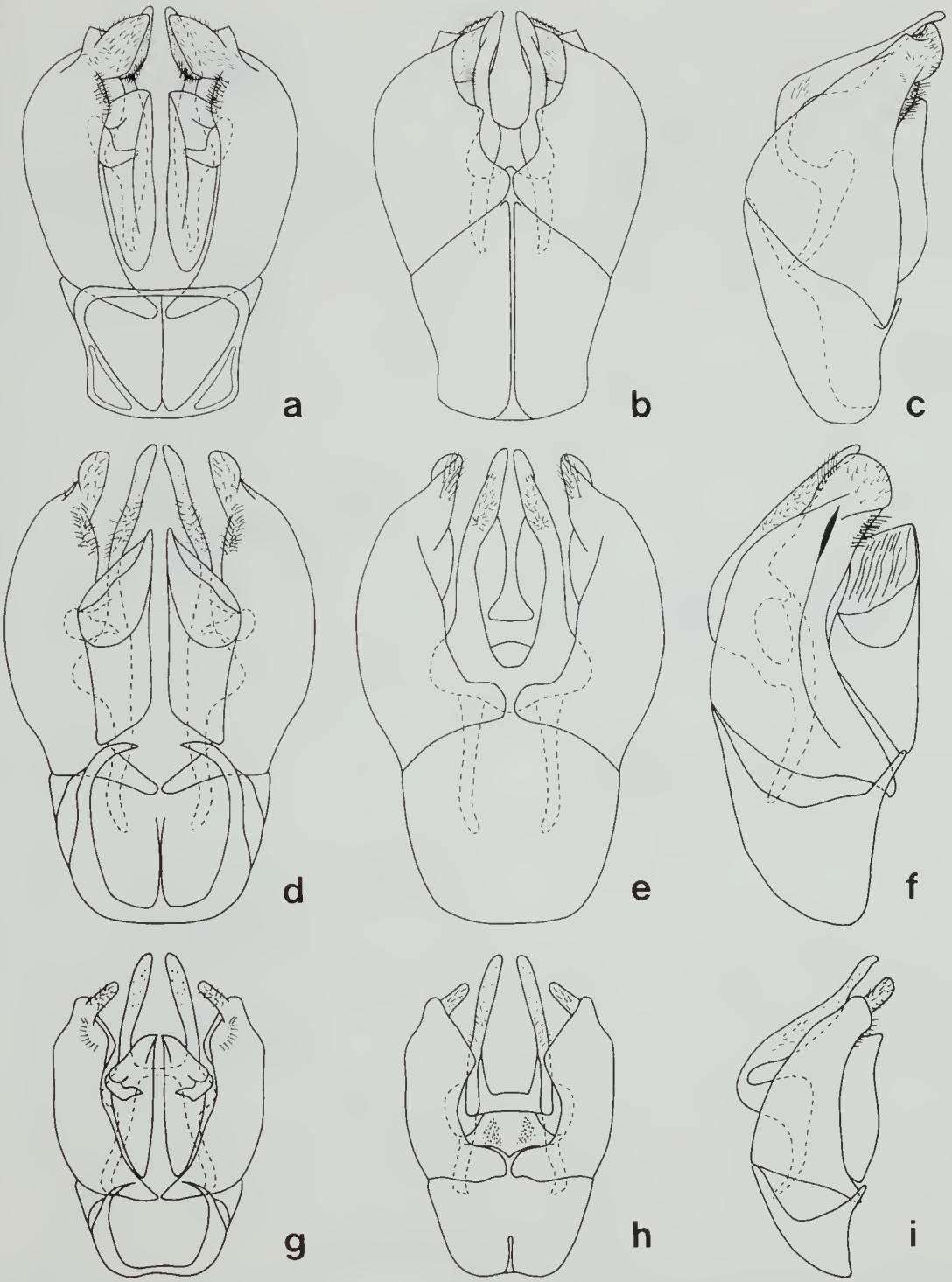

Figure 22. Ventral, dorsal and lateral views of male genitalia of *H. (Homalictus)* spp. a, b, c, *H. stradbrokensis*; d, e, f, *H. multicavus*; g, h, i, *H. murrayi*. Scale line equals 0.5 mm.

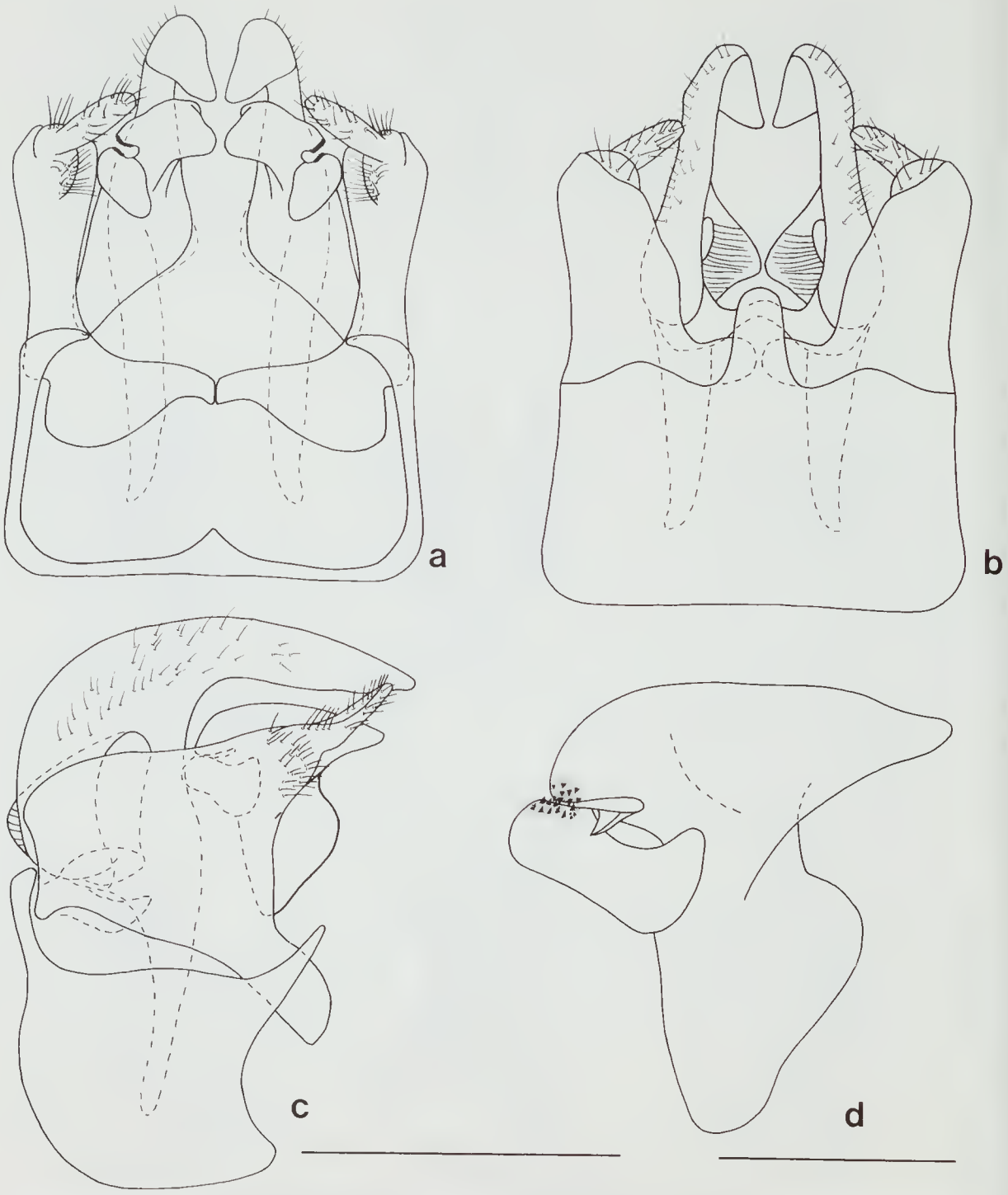

Figure 23. a, b, c, ventral, dorsal and lateral views of male genitalia of *H. (Quasilictus) brevicornutus*. Scale line left equals 0.5 mm. d, lateral view of right volsella. Scale line right equals 0.2 mm.

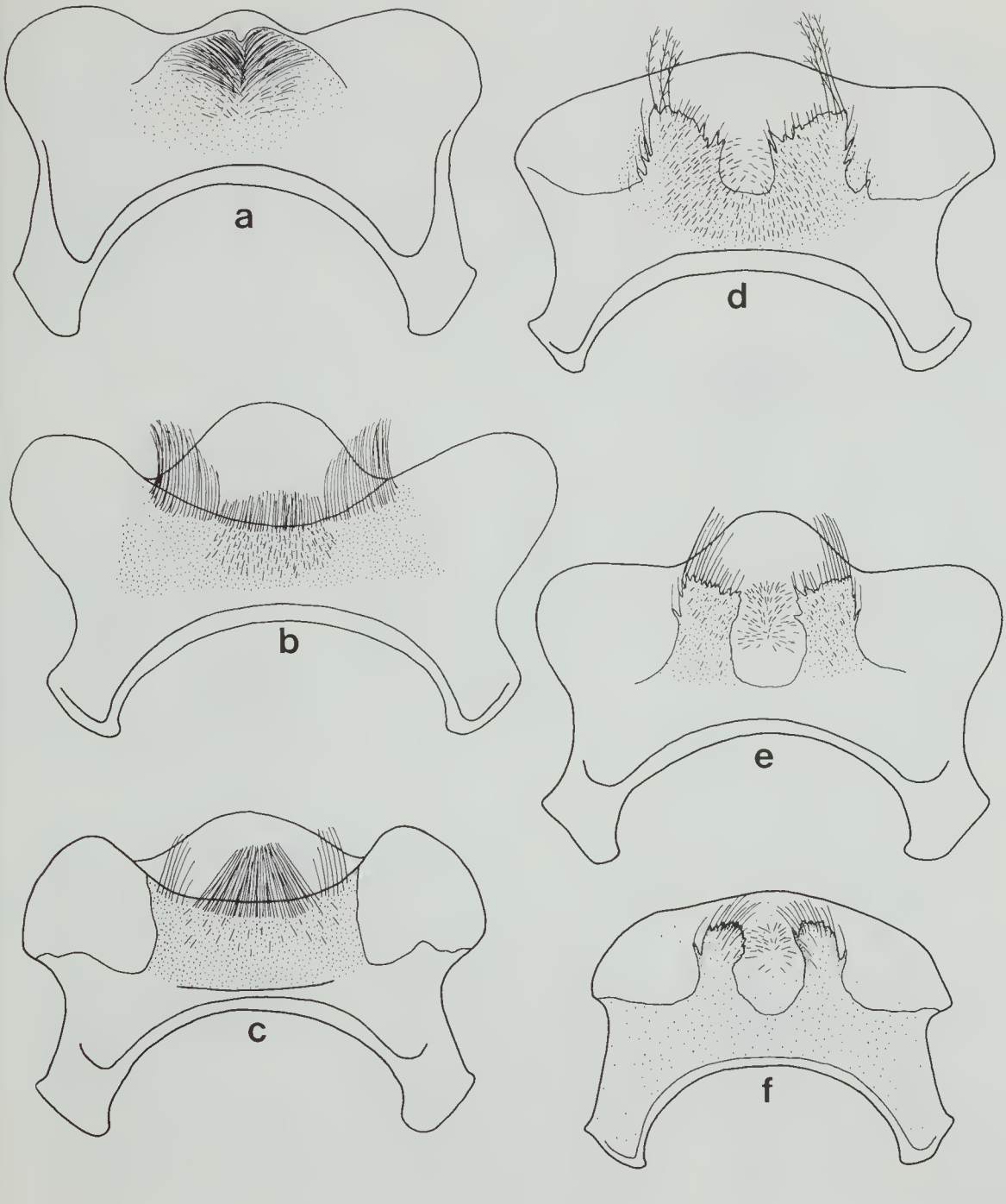

Figure 24. Ventral views of male gastral sternum VI of *H. (Homalictus)* spp. (Stippling indicates areas of dark pigmentation). a, *H. behri*; b, *H. woodsi*; e, *H. caloundrensis*; d, *H. callaspis*; e, *H. flindersi*; f, *H. exleyae*. Scale line equals 0.5 mm.

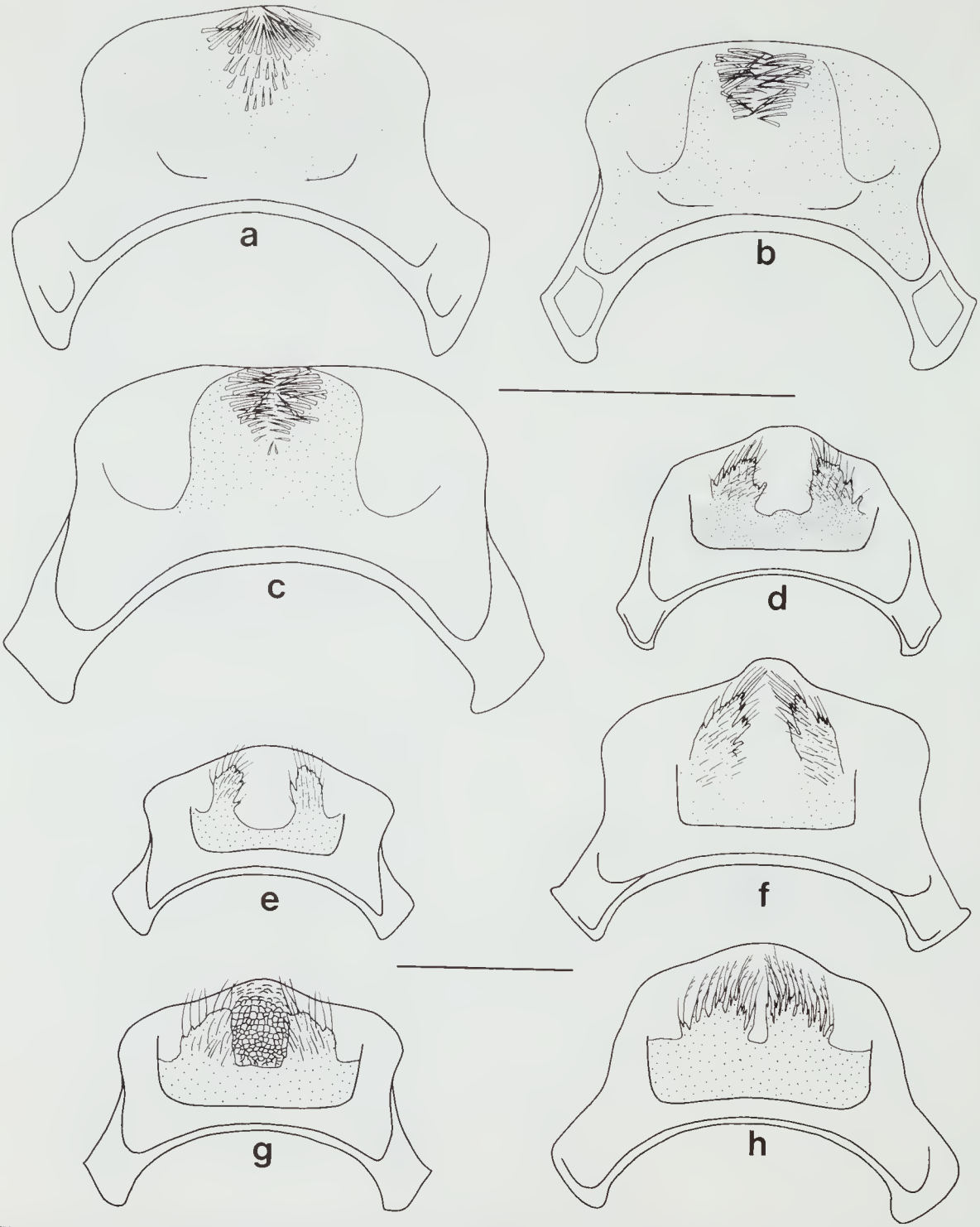

Figure 25. Ventral views of male gastral sternum VI of *H. (Homalictus)* spp. (Stippling indicates areas of dark pigmentation). a, *H. sphecodopsis*; b, *H. dotatus*; c, *H. imitatus*; d, *H. sphecodoides*; e, *H. houstoni*; f, *H. scrupulosus*; g, *H. niveifrons*; h, *H. megastigmus*. Both scale lines equal 0.5 mm; upper refers to Figs. a-c, lower refers to Figs. d-h.

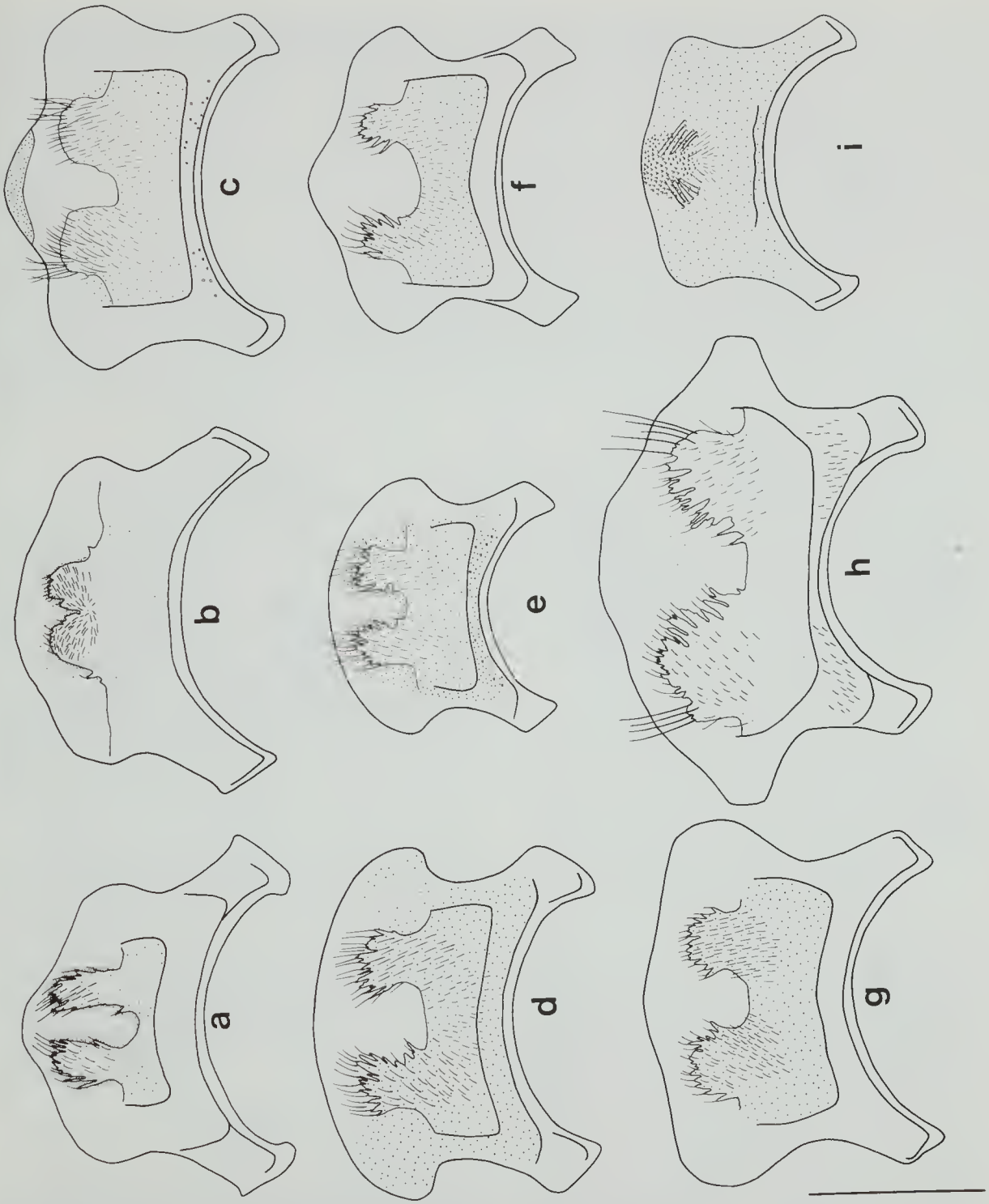

Figure 26. Ventral views of male gastral sternum VI of *H. (Homalictus)* spp. (Stippling indicates areas of dark pigmentation). a, *H. punctatus*; b, *H. ctenander*; c, *H. blackburni*; d, *H. dampieri*; e, *H. eurhodopus*; f, *H. cassiaefloris*; g, *H. latitarsis*; h, *H. grossopedalus*; i, *H. urbanus*. Scale line equals 0.5 mm.

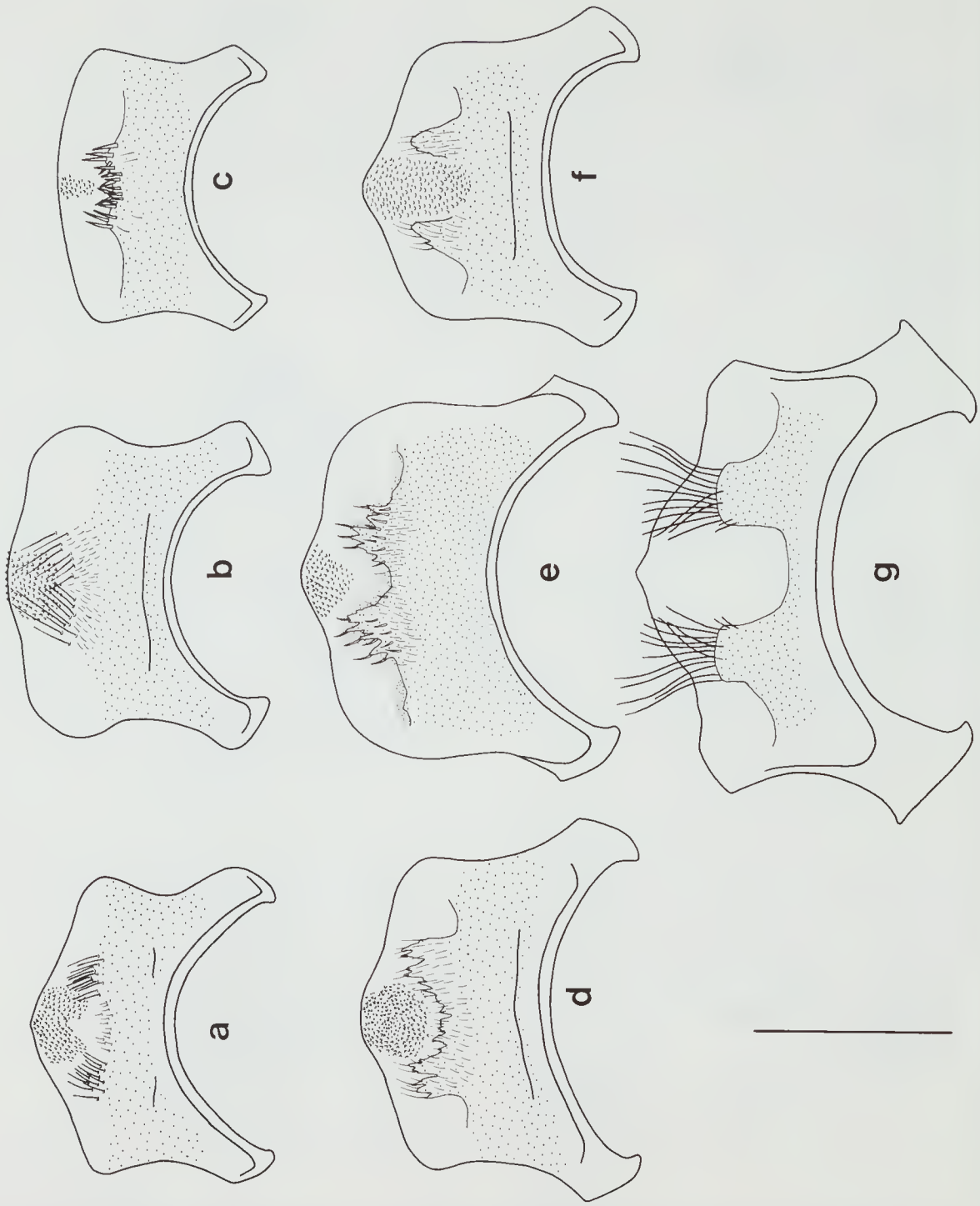

Figure 27. Ventral views of male gastral sternum VI of *H. (Homalictus)* spp. (Stippling indicates areas of dark pigmentation). a, *H. exophthalmus*; b, *H. forrestae*; c, *H. bremerensis*; d, *H. stradbrokensis*; e, *H. multicavus*; f, *H. murrayi*; g, *H. brevicornutus*. Scale line equals 0.5 mm.