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A Revision of the Australian Species of *Iphiaulax* Foerster and *Chaoilta* Cameron (Insecta: Hymenoptera: Braconidae)

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ABSTRACT. Identification keys are provided for the Australian species of *Iphiaulax* Foerster and *Chaoilta* Cameron. *Iphiaulax brunneipennis* n.sp. from Victoria, *Iphiaulax latistigma* n.sp. from Queensland and the Solomons, *Iphiaulax danielsi* n.sp. from New South Wales, and *Chaoilta hollowayi* n.sp. from New South Wales, Queensland and Western Australia are described and illustrated. *Iphiaulax australiensis* Ashmead, *I. dubitorius* (Fabricius), *I. innotatus* (Turner), *I. proficiscator* (Fabricius), *I. rufus* Szépligeti, *C. decorata* (Szépligeti), *C. insularis* (Cameron), *C. lutea* Cameron and *C. nigriceps* (Cameron) are redescribed and illustrated. *Blastomorpha* Szépligeti, previously synonymised with *Chaoilta*, is raised in status to that of a subgenus of *Chaoilta*. *Ichneumon hospitator* Fabricius is treated as a junior synonym of *Iphiaulax proficiscator* (Fabricius) and *Iphiaulax turneri* Baltazar is treated as a junior synonym of *Ichneumon dubitorius* Fabricius. Two species are removed from *Iphiaulax*: *rubricepsis* Shenefelt to the Doryctinae and *trinotata* Ashmead to *Bracon* Fabricius. Distribution maps and flight period histograms are provided for the four commonest species of *Iphiaulax* viz. *I. australiensis*, *I. dubitorius*, *I. proficiscator* and *I. rufus*. Two species of *Chaoilta* are recorded from Australia for the first time, viz. *C. insularis* and *C. lutea*.

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The Australian species of two genera of parasitic, braconine wasps are revised. These genera, *Iphiaulax* Foerster and *Chaoilta* Cameron, comprise a number of moderately sized to large, and often brightly coloured insects and include several common Australian species, though these have been little-studied in the past.

Few braconine genera have been so frequently misinterpreted as has *Iphiaulax*. Species of *Iphiaulax* are

frequently common, large and brightly coloured, and consequently, they are often collected and many of them have been described; approximately 520 species are listed in Shenefelt (1978). Several species were common and conspicuous enough to have been included in early systematic collections from Australia and thus three species names date back to the late eighteenth century works of Fabricius (see also Zimsen, 1964).

Despite the fact that *Iphiaulax* is an easily characterised genus (Quicke, 1986, 1987, 1988a), the Australian species have often been placed under other generic names, the most common of these being *Cyanopterus* Haliday and *Bracon* Fabricius, both of which are valid and distinct genera. Particular authors were inconsistent in their placements of *Iphiaulax* species as several placed great emphasis on whether or not the second metasomal suture was crenulate. Thus *Iphiaulax* species with a crenulate suture were usually identified correctly as *Iphiaulax* but those with a smooth suture were often placed in *Cyanopterus* which they superficially resemble. Thus the Australian species of *Cyanopterus* treated in Turner's (1918) key are in fact species of *Iphiaulax*, while in the same paper he described another species of *Iphiaulax* under the correct generic name. The same artificial splitting of *Iphiaulax* was also made by Szépligeti (1904, 1906). To confuse matters even further, species belonging to other genera have often been misidentified as belonging to *Iphiaulax*, and in Australia this has been particularly true for species of the common genus *Poecilobracon* Cameron. Given this confusion, the Australian species have been revised, each is described and illustrated. A key to species, distribution maps and flight period histograms for the commoner species are provided.

Members of the genus *Chaoilta* Cameron are usually medium-sized to large braconine wasps, and are found from India through to Australia and on some of the larger islands of Oceania. *Chaoilta* belongs to the cosmopolitan *Atanycolus* Foerster group of genera (Quicke, 1987) as is evidenced by the complex form of the scapus and pedicellus (Fig.7a). In addition, *Chaoilta* species are typically more or less strongly dorsoventrally compressed, and possess characteristic facial architecture with a transverse, sharply projecting ledge shortly below the antennal sockets (Fig.7a-c). These features collectively make *Chaoilta* one of the world's more distinctive of braconine genera, and consequently relatively easy to identify.

Only two species of *Chaoilta* have been recorded from Australia (Parrott, 1953) although rather more have been described from Papua New Guinea, Indonesia and the Philippines, bringing the total number of species described from that part of the world to 33 (Shenefelt, 1978; see both *Chaoilta* and *Platybracon*). However, several of these may prove to be synonyms when the species of the whole region are revised. A total of five Australian species were found as a result of the present study, one of which is new and is described and illustrated below. An illustrated key to the Australian species of *Chaoilta* is provided.

Terminology follows that of van Achterberg (1979, 1988) with additions and modifications according to Quicke (1989). Thus, ovipositor length, unless stated otherwise, is taken as the length of that part which extends beyond the apex of the metasoma when the ovipositor is directed posteriorly, and the width of the first metasomal tergite refers to the maximum width of the sclerotised tergum.

The following definitions, ratios and abbreviations are used: tentorial ratio = height of clypeus : inter-tentorial distance : tentorio-ocular distance; facial ratio = width of face : width of head : height of eye; ocellar ratio = postocellar length : transverse diameter of posterior ocellus : shortest distance between posterior ocellus and eye; head index = length of head behind eye/horizontal length of eye; radial sector ratio = length of vein SR1 : length of 3-SR : length of r; submarginal cell ratio = length of vein 2-SR; length of 3-SR : length of r-m; pterostigmal index = length of pterostigma/maximum width of pterostigma; hindwing vein ratio = length of vein 1r-m : length of vein SC+R1; fore leg ratio = length of fore femur excluding trochantellus : length of fore tibia : length of fore tarsus; fore basitarsal index = length of fore basitarsus/maximum depth of fore basitarsus; hind leg ratio = length of hind femur excluding trochantellus : length of hind tibia : length of hind basitarsus; hind basitarsal index = length of hind basitarsus/maximum depth of hind basitarsus.

Note that some of these characters are only used in connection with descriptions of species in one of the two genera treated here. For example, the tentorial ratio cannot be applied easily to members of the genus *Chaoilta* because of their modified, compressed faces, while the head index is of no practical value in dealing with *Iphiaulax* species as head shape is relatively uniform across the genus. Figures are shaded as if illuminated from the upper right. Specimen data are arranged by state and are given as : number of each sex, locality, notes (if any) collection date (month and year), and collection (in parentheses).

Collections containing material relevant to this study are abbreviated as follows: Australian Museum, Sydney (AM); Australian National Insect Collection, Canberra (ANIC); Bishop Museum, Honolulu (BMH); British Museum (Natural History), London (BMNH); Department of Primary Industries, Entomology Branch, Brisbane (DPIB); Hungarian Natural History Museum, Budapest (HNHM); Queensland Museum, Brisbane (QM); Queensland University, St Lucia (QU); Quicke Collection (QC); United States National Museum, Washington DC (USNM); Western Australian Museum, Perth (WAM).

Systematics

Iphiaulax Foerster, 1862

- Iphiaulax* Foerster, 1862: 235.—Parrott, 1953: 207.
Aniphiaulax Kokoujev, 1899: 408 (*Vipio* (*Aniphiaulax*) *jakowlewi* Kokoujev, 1899, monotypy).
Iphiaulacidea Fahringer, 1926: 203 (*Ichneumon impostor* Scopoli, 1763, designated by Muesebeck & Walkley, 1951).
Euglyptobracon Telenga, 1936: 104 (*Bracon umbraculator* Nees von Esenbeck, 1834, original designation).

Type species. *Ichneumon impostor* Scopoli, 1763, monotypy.

Description. Female. Antennae longer than forewing, tapering gradually from base to apex. Median flagellomeres much wider than long. Scapus large, longer ventrally than dorsally in lateral aspect, apicolaterally strongly emarginate, distinctly apicomediaally emarginate. Lower part of clypeus strongly reflexed into the hypoclypeal depression. Eyes almost glabrous. Frons not or hardly impressed behind the antennal sockets, with a midlongitudinal sulcus, glabrous. Head narrowing behind the eyes. Mesosoma smooth and shiny. Mesoscutum largely glabrous, notauli weak. Scutellar sulcus narrow and usually crenulate. Precoxal suture absent. Mesopleural suture smooth. Propodeum without carinae or coarse sculpture. Forewing vein 3-SR more than 1.9 times length r-m (usually more than 2.2 times). Forewing vein r-m with 2 bullae. Vein SR1 reaching wing margin more than 0.9 of the distance between the pterostigma and the wingtip. Vein 1-SR+M more or less straight. Veins 1-SR and C+SC+R forming an angle of 50-60°. Vein cu-a interstitial or slightly postfurcal. Vein 3-CU1 not or only weakly expanded posteriorly. Hindwing vein 1r-m usually slightly shorter than vein SC+R1. Base of hind wing with glabrous area immediately distal to vein cu-a. Apex of hindwing vein C+SC+R with more than 1 especially thickened bristle. Claws simple with rounded basal lobe. First metasomal tergite with complete, sublamelliform dorsolateral carinae, without dorsal carinae; raised median area smooth or sculptured, rarely (*I. australiensis*, see below) with a midlongitudinal carina. Second metasomal tergite considerably wider than long, without a distinct midbasal raised triangular area, with pair of sublateral grooves which curve towards one another anteriorly. Second suture smooth or crenulate. Third tergite with distinct posteriorly-diverging, anterolateral grooves. Tergites 3-5 with transverse, subposterior grooves; posterior margins fully sclerotised and distinctly curved in profile. Ovipositor robust, usually 0.5-1.0 times length of metasoma; without preapical dorsal nodus and without distinct preapical ventral serrations.

Male. Generally similar to females but often smaller. Mesosoma relatively more elongate in males. Genitalia with an extremely elongate, often medially with a strongly produced basal ring (Fig.4); parameres and volsellae with few setae; digitus with single apical tooth (Quicke, 1988d). Rectum not fused to eighth abdominal tergite and intertergal gland between seventh and eighth abdominal terga small (Quicke, in press).

Biology. *Iphiaulax* is a widespread genus within the Old World with many described species, though records from the New World all appear to be referable to the superficially similar genus, *Digonogastra* Viereck (Quicke, 1988a). *Iphiaulax* species are idiobiont ectoparasitoids and the majority of reliable host records indicate the members of this genus primarily attack cerambycid beetle larvae (Quicke, 1988b), though some species do appear to parasitise other hosts even including concealed Lepidoptera larvae.

Little is known about the hosts of Australian species of *Iphiaulax*. One specimen of *I. dubitorius* in the DPIB collection is labelled as being bred from a 'citrus stemborer larva', probably the cerambycid, *Platymopsis pulverulens* (Boisduval), and a specimen of *I. proficiscator* in the ANIC is recorded as having emerged from a Mimosa branch that appeared to have been bored-out by cerambycids. These records therefore support the contention that Australian *Iphiaulax* species are also principally parasites of Cerambycidae. The few published records of *Iphiaulax* which indicate other hosts should therefore be treated with caution, particularly as members of other genera of wasps were frequently misidentified as belonging to *Iphiaulax* in the past. Nevertheless, three papers reporting host records for Australian *Iphiaulax* should be noted. Newman & Clark (1924) reported on *Iphiaulax* species as having been reared from the tuart bud weevil, *Cryptoplus* [as *Haplonyx*] *tibialis* (Lea). However, examination of their photograph suggests that the braconid concerned belongs to some other genus (possibly *Poecilobracon*) as the female has a relatively longer ovipositor than most Australian *Iphiaulax* and the wing pattern does not agree well with that of any of the known Australian species. Chadwick & Nikitin (1976) also record an unidentified *Iphiaulax* sp. from a weevil host, *Oemethylus triangularis* Lea. Unfortunately the author has not been able to examine their specimen but as they note the species as belonging to *Iphiaulax sensu lato* it may well belong to some other genus. Chadwick & Nikitin (loc. cit.) also provide a host record for *I. rubriceps* Froggatt, but this species belongs to the Doryctinae (see below). Finally, Champ (1966) reports an *Iphiaulax* as a parasite of the gelechiid pest, *Scrobipalpa heliopa* (Lower). Again the author has not been able to examine the material, however, the record seems unlikely on the basis of the other known hosts.

Key to the Australian Species of *Iphiaulax*

(females only)

1. Pterostigma more than 2.4 times longer than wide (Fig. 1b-f); pterostigma largely yellow; metasoma largely yellow to red (at least tergites 1-3) 2
- Pterostigma less than 2.3 times longer than wide (Fig. 1a); pterostigma ivory-white; metasoma largely black or piceous *I. latistigma* n.sp.

2. Metasoma with a piceous-brown or black apex (at least tergites 5-7); hind femur largely black 3
- Metasoma entirely yellow, orange or red; hind femur entirely orange or yellow 6
3. Mesosoma with at least the mesoscutum and propodeum black; second metasomal suture crenulate (Fig. 2b,d); total ovipositor length less than 0.75 times forewing length 5
- Mesosoma without black markings; second metasomal suture completely smooth (see Fig. 2c); total ovipositor length more than 0.75 times forewing length 4
4. Fore and mid legs entirely black; forewing including pterostigma entirely brown (Fig. 3b); fourth metasomal tergite black *I. brunneipennis* n.sp.
- Fore and mid legs orange-yellow except for tarsi; forewing with basal 0.4 yellow and pterostigma with basal 0.7 yellow; fourth metasomal tergite orange-yellow *I. danielsi* n.sp.
5. First metasomal tergite with a well-developed midlongitudinal carina (Fig. 2a); scutellum piceous brown or black; ovipositor preapically approximately 1.4 times deeper than the diameter of the second flagellomere (Fig. 2e); hind trochanters piceous brown or black *I. australiensis*
- First metasomal tergite without a midlongitudinal carina or ridge; scutellum yellow or orange-red; ovipositor pre-apically less deep than diameter of the second flagellomere (Fig. 2f); hind trochanters yellow *I. dubitorius*
6. Forewing boldly patterned brown on yellow (Fig. 1c-f) 7
- Forewing almost entirely brown, only the pterostigma, a small area below this and the extreme base yellowish (Fig. 1b) *I. innotatus*
7. Forewing with a broad yellow band extending transversely from below pterostigma to, or nearly to, the posterior wing margin (Fig. 1e) *I. proficiscator*
- Forewing with a smaller clear area in the first submarginal cell extending just into the second subdiscal cell (Fig. 1d) *I. rufus*

***Iphiaulax australiensis* Ashmead**

Figs 1c, 2a,b,e, 4a, 5a, 6a

Iphiaulax australiensis Ashmead, 1900: 360 (not Szépligeti 1905, 1906).—Szépligeti, 1904: 23.
Hybogaster australiensis.—Roman, 1915: 15.—Parrott, 1953: 207.—Shenefelt, 1978: 1689.

Material examined. HOLOTYPE male labelled "Australia" (USNM).

New South Wales: 1 male, 1 female, Round Hill Fauna Reserve, Oct. 1977 (AM); 1 female, Lane Cove Sydney, Oct. 1946 (AM); 1 male, Sydney, no date (AM); 1 female, Cobar, Oct. 1957 (ANIC). Northern Territory: 1 female, Alice Springs, Feb. 1966 (ANIC); 1 female, Alice Springs, Sept. 1978 (QC). Queensland: 1 male, Boulia, Oct. 1978

(ANIC); 2 females, Julian Creek, July 1932 (DPIB); 1 female, Kiata, Dec. 1918 (AM); 1 female, Kihee, Oct. 1949 (ANIC); 1 female, Quondong, 7 mi (= 11 km) west of Tarco, no date (ANIC). South Australia: 1 female, Mount Illibillee, Everard Ranges, May 1988 (AM); 1 female, Elizabeth Springs, May 1981 (AM); 1 female, Quorn, Apr. 1978 (ANIC); 1 male, Lyndhurst, Sept. 1972 (ANIC); 1 male, Brachina, Nov. 1987 (ANIC); 1 female, Broken Hill, Nov. 1949 (ANIC). Western Australia: 1 male, Yalgoo, Sept. 1981 (AM); 1 female, Duri, Feb. 74 (AM); 1 female, Fremantle, Apr. 1934 (ANIC); 1 male, Kalbarri, Nov. 1971 (ANIC); 1 female, Hopetown, Jan. 1987 (QU); 1 male, Murchison River near north-west Coastal Highway crossing, Jan. 1976, "on *Eucalyptus* sp." (QU); 1 male, Lake Grace, no date (WAM); 2 females, Forrest Dale, no date (WAM); 1 female, Tallering Stn, Sept. 1976 (WAM); 1 female, 37 km south-west of Glenayle HS, Aug. 1983 (WAM); 1 male, King's Park, Mar. 1964 (WAM); 1 female, 9.75 km north-north-west of Mount Linden, Mar. 1979, "feeding on lerps on *Eucalyptus*" (WAM); 1 female, Millstream, July 1958, "on flowers of *Acacia*" (WAM); 1 female, 8.4 km north-north-west of Cataby, Jan. 1983 (WAM); 1 male, Cadoux, Oct. 1981 (WAM); 1 female, 7 km north-west of Hamersby Inlet, Nov. 1979, "flying near dead branch of *Eucalyptus tetragena*" (WAM); 1 male, Reserve 6 km east-north-east of Meredin, Oct. 1978 (WAM).

length of forewing 10-13 mm and length of ovipositor (part exerted beyond the apex of the metasoma) 3-5 mm. Antenna with approximately 100 flagellomeres. Tentorial ratio = 1.23:1.0. Face densely with long (yellow) setae, with deep punctures at bases of setae, smooth and shiny between punctures. Facial ratio = 1.0: 1.94:1.0. Frons broadly depressed, with well-developed midlongitudinal sulcus, smooth, shiny and glabrous except for row of setae near margin of eye. Ocellar ratio = 1.36:1.0 2.24. Mesosoma 1.65 times longer than high. Scutellar sulcus totally smooth. Propodeum moderately longsetose laterally, more sparsely so medially. Radial sector ratio = 5.76: 3.46:1.0. Submarginal cell ratio = 1.25:2.25:1.0. Pterostigmal index = 2.8. Vein 1-SR+M very weakly sinuate. Vein cu-a more or less interstitial. Vein 3-CU1 distinctly swollen posteriorly. Hindwing vein ratio = 1.0:1.06. Apex of hindwing vein C+SC+R with 3-6 especially thickened bristles. Fore leg ratio = 1.0:1.23:1.7. Hind leg ratio = 1.95:3.0:1.0. Hind basitarsal index = 5.4. First metasomal tergite approximately 1.3 times wider than long; with well-developed dorsolateral carinae which run more or less in parallel to the posterior margin of the tergite where they are moderately widely removed from the edge of the tergite; raised median area with a well-developed midlongitudinal carina, with irregular deep foveate sculpture especially posteriorly, bordered by a few short crenulae especially anteriorly. Second

Description. *Female.* Length of body 10-13 mm,

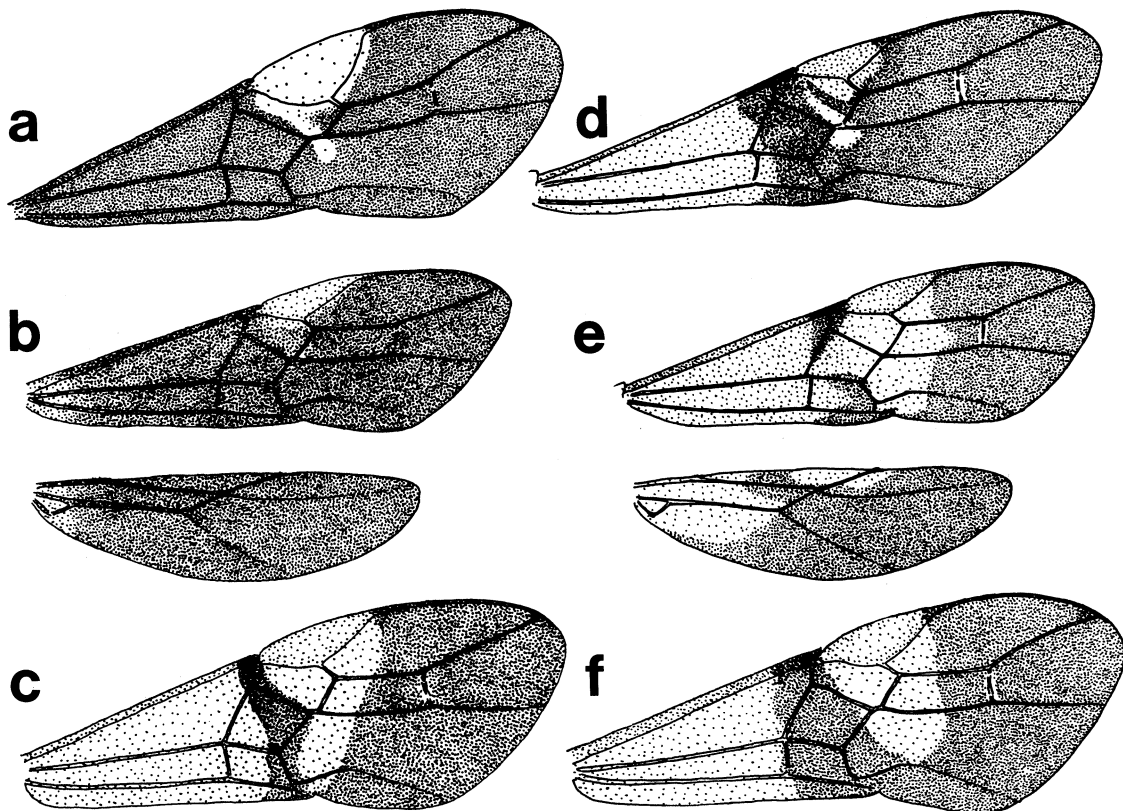


Fig.1. Wing colour patterns – a, *I. latistigma* n.sp.; b, *I. innotatus* c, *I. australiensis*; d, *I. rufus*; e, *I. proficiscator*; f, *I. dubitorius*. Scale bar: a-e, 0.25 mm; f, 0.2 mm.

metasomal tergite between the (crenulate) sublateral grooves with foveate rugose sculpture. Second tergite 2.0 times wider than medially long. Second suture wide, deep and finely crenulate. Third tergite with a well-developed subposterior, crenulate groove; smooth apart from the crenulate grooves. Fourth to sixth tergites smooth and each with a smooth subposterior groove. Ovipositor very robust, deepening from near the base to the preapical region; maximum depth more than 1.3 times the diameter of the basal flagellomere. Yellow to yellow-orange except for the following which are black: antennae, a stripe from eye to eye across the top of the

head, mesoscutum, scutellum, mesopleuron, mesosternum, metanotum, metapleuron, propodeum, mid-coxa, mid-trochanter, mid-femur (except the apical quarter), hind coxa, trochanter, femur, tibia (except for the basal quarter), tarsus, metasomal tergites 5-7, ovipositor sheaths. Wings yellow with a narrow transverse dark brown band below the parastigma of the forewing, and an extensive mid-brown apical zone on both the fore and hind wings.

Male. As for females though generally somewhat smaller. Genitalia with extensively and densely setose parameres. Volsellae broadly, densely setose. Digitus with

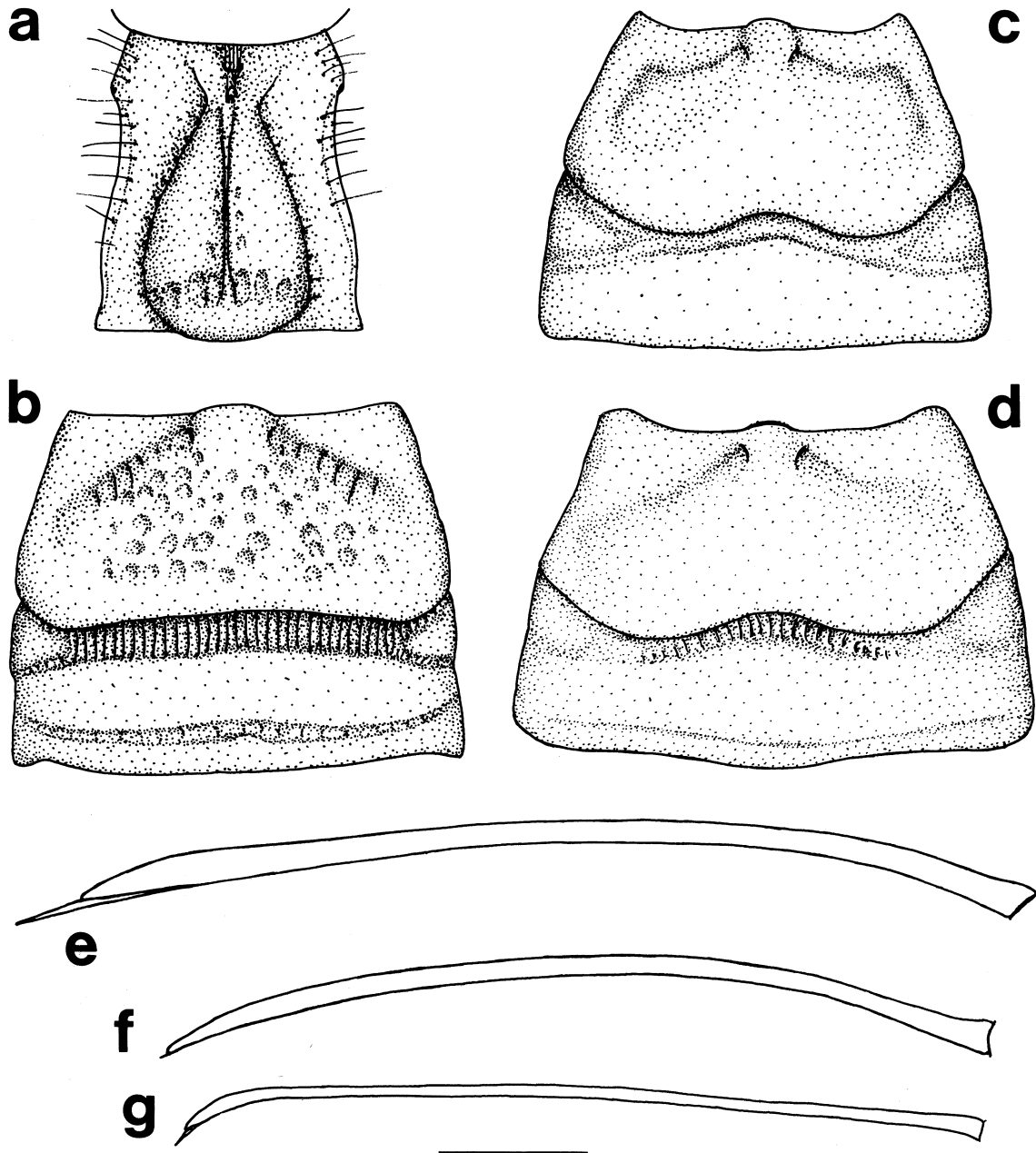


Fig.2. Metasomal and ovipositor features – a,b, *I. australiensis*; c, *I. rufus*; d, *I. dubitorius*; e, *I. australiensis*; f, *I. dubitorius*; g, *I. danielsi* n.sp. Scale bar: a-c, 1.0 mm; d, 1.5 mm; e,f, 0.8 mm; g, 1.8 mm.

one apical tooth-like process. Basal ring very elongate.

Notes. Collection dates indicate that adults of this species are probably active throughout the year but are relatively more abundant around October (Fig.5a). *Iphiaulax australiensis* is the most widely distributed of the Australian *Iphiaulax* species (Fig.6a) though there are no records from north of 20° and the author is not aware if any specimens from Victoria, Tasmania, nor of any from outside of Australia. It should be noted that unlike the other Australian species, *I. australiensis* has been collected frequently from the interior and also from the south west.

Iphiaulax australiensis is a highly aberrant species differing from more typical *Iphiaulax* not only in the presence of a strong midlongitudinal carina on the first metasomal tergite (Fig.2a) but also in the densely setose parameres of the male genitalia (Fig.4a). These differences are sufficient to warrant asking whether or not *australiensis* should be placed in *Iphiaulax* or in a new genus. In particular, extensively setose parameres are usually considered to be plesiomorphic whereas largely glabrous (except for the apical margin) ones as

found in other *Iphiaulax* (Fig.4b) are considered apomorphic (Quicke, 1988d). Thus, *australiensis* can only readily be included in *Iphiaulax* if its setose parameres are considered an independent apomorphic feature. Significantly, *Iphiaulax* species, together with those of some possibly related genera (eg. *Plaxopsis* Szépligeti, *Pseudovipio* Szépligeti & *Zanzopsis* van Achterberg), have the basal ring particularly strongly produced anteroventrally (Quicke, 1988a,d). In *I. australiensis* the basal ring is very strongly produced anteriorly and therefore it seems reasonable to assume, at least for the present, that the setose parameres and carinate first tergite are indeed peculiarities of *I. australiensis* and that it should be retained within *Iphiaulax*.

***Iphiaulax brunneipennis* n.sp.**

Fig.3a-d

Material examined. HOLOTYPE female labelled "c.

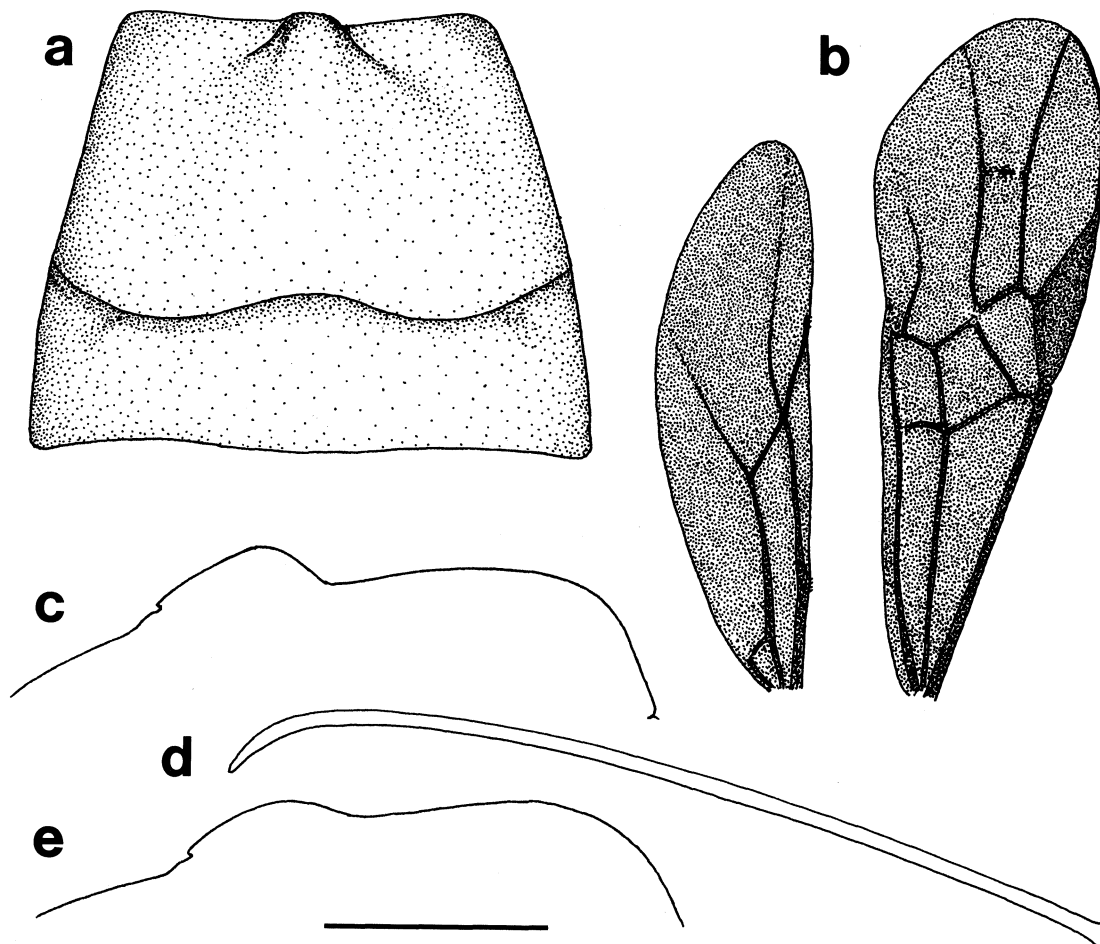


Fig.3. a-d, *I. brunneipennis* n.sp. – a,d: a, metasomal tergites 2+3; b, wings; c, dorsal profile of mesosoma; d, ovipositor. e, *I. danielsi* n.sp. – dorsal profile of mesosoma. Scale bar: a, 1.0 mm; b, 3.0 mm; c,e, 1.2 mm; d, 2mm.

7.2.01 Victoria" and "R.E. Turner. 1909-123" (NHM).

Description. *Female.* Length of body 8.8 mm, of forewing 9.0 mm and of ovipositor (part exerted beyond apex of metasoma) 6.6 mm. First flagellomere 1.0 and 1.2 times longer than the second and third respectively, the latter 1.07 times longer than deep. Tentorial ratio = 1.0:2.5:2.0. Face with only small punctures at bases of setae, smooth and shiny between these. Facial ratio = 1.0:1.76:1.05. Frons with a few setae on lateral 0.25, otherwise glabrous and shiny. Ocellar ratio = 1.0:1.0:2.17. Mesosoma 1.64 times longer than high. Scutellar sulcus distinctly though rather weakly crenulate. Scutellum strongly protruding in lateral aspect. Propodeum moderately densely long setose laterally, sparsely setose medially. Radial sector ratio = 7.5:5.5:1.0. Submarginal cell ratio = 1.0:2.5:1.0. Pterostigmal index = 2.8. Vein 1-SR+M nearly straight. Vein cu-a marginally postfurcal. Vein 3-CU1 not expanded posteriorly. Hindwing vein ratio = 1.0:1.18. Apex of hindwing vein C+SC+R with 4 especially thickened setae. Fore leg ratio = 1.0:1.1:1.62. Hind leg ratio = 1.79:2.65:1.0. Hind basitarsal index = 6.0. First metasomal tergite 1.35 times longer than wide. Second tergite 1.9 times wider than medially long. Second suture sinuate and smooth. Third metasomal tergite with poorly defined anterolateral areas. Fourth and fifth tergites with smooth, transverse, subposterior grooves. Ovipositor approximately 3.45 times longer

than medial length of syntergite 2+3; total length approximately 1.18 times longer than forewing; apically strongly down-curved; maximum depth (preapical) equal to diameter of third flagellomere. Red-orange except for the following which are black (or piceous): antennae, head, legs, metasomal tergites 4-8, ovipositor sheaths. Wings uniformly brown with dark brown pterostigma and venation.

Etymology. Name refers to uniformly brown wings.

Iphiaulax danielsi n.sp.

Figs 2g, 3e

Material examined. HOLOTYPE female, labelled "47 km NE Inverell NSW 8 Jan 1978 G. Daniels." (QU).

Description. *Female.* Length of body 9 mm, of forewing 10 mm, and of ovipositor (part exerted beyond apex of metasoma) 7.7 mm. Antenna with 94 flagellomeres. Terminal flagellomere acuminate. Tentorial ratio = 1.0 : 2.45 : 1.96. Face shiny between puncture, at the bases of (black) setae. Facial ratio = 1.0:2.1:1.06. Frons glabrous, weakly, broadly impressed with midlongitudinal sulcus. Ocellar ratio = 1.0:1.1:2.4. Mesosoma 1.7 times longer than high. Scutellar sulcus

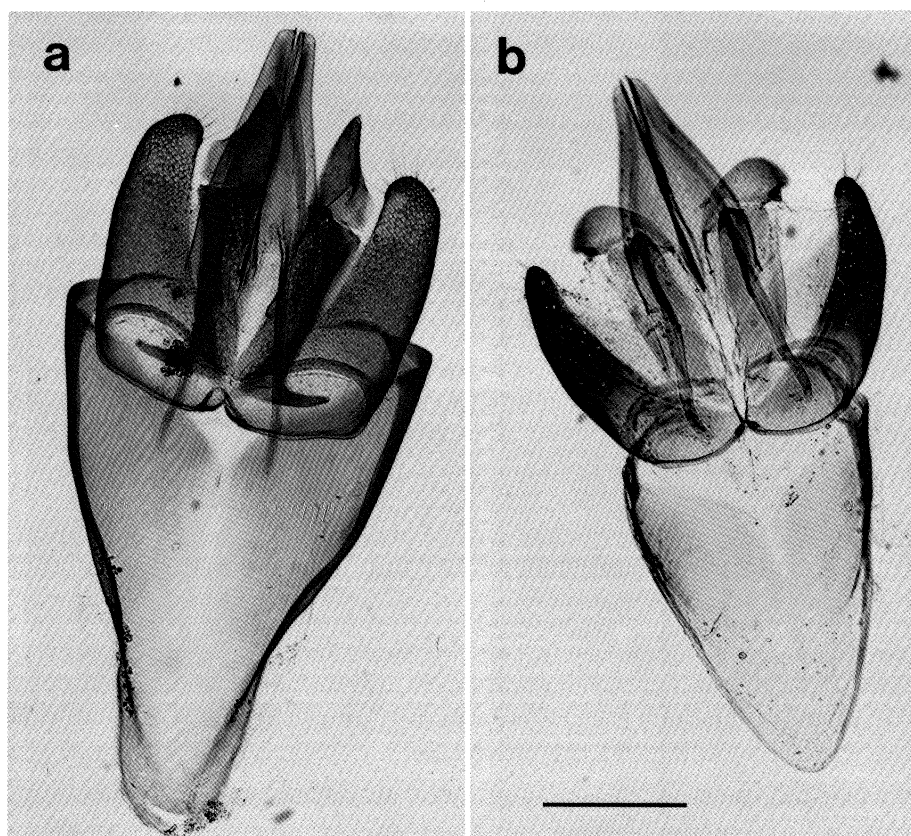


Fig.4. Male genitalia – a, *I. australiensis*; b, *I. dubitorius*. Scale bar: a,b, 0.25 mm.

totally smooth. Propodeum densely long-setose laterally, sparsely setose medially. Radial sector ratio = 5.28:4.0:1.0. Submarginal cell ratio = 1.0:2.38:1.0. Pterostigmal index = 2.8. Vein 1-SR+M more or less straight. Vein cu-a marginally postfurcal. Vein 3-CU1 not expanded posteriorly. Hindwing vein ratio = 1.0:1.22. Apex of hindwing vein C+SC+R with 6 thickened setae. Fore leg ratio = 1.0:1.12:1.4. Hind leg ratio = 1.83:2.59:1.0. Hind basitarsal index = 5.75. First metasomal tergite 1.53 times longer than maximally wide. Second tergite 2.04 times wider than medially long. Second suture sinuate and smooth. Fourth and fifth tergites with smooth, transverse, subposterior grooves. Ovipositor approximately 3.4 times longer than medial length of syntergite 2 + 3; total length approximately equal to forewing length; maximum depth (preapical) 1.03 times diameter of basal flagellomeres. Orange yellow except for the following which are black (or piceous): antennae, head except palps, mid-tarsus, hind coxa (except base and apex), hind trochanter (except dorsally), hind femur (except trochantellus and extreme apex), hind tibia except base, hind tarsus, metasomal tergites 5-8, hypopygium and ovipositor sheaths. Wings with basal 0.4 yellow, remainder dark brown-grey except pterostigma yellow for basal 0.7 and a small posteriorly narrowing clear zone posterior to pterostigma.

Etymology. Named in honour of G. Daniels, the collector.

Notes. Closely related to *I. brunneipennis* n.sp. differing from it principally in colouration though *I. brunneipennis* has a distinctly crenulate scutellar sulcus and smaller glabrous area at the base of the hind wing.

***Iphiaulax dubitorius* (Fabricius)**

Figs 1f, 2d,f, 4b, 5d, 6b

Ichneumon dubitorius Fabricius, 1775: 331.

Iphiaulax transiens Turner, 1918: 95 (non Szépligeti, 1904:173) n.syn.–Parrott, 1953: 208.

Iphiaulax turneri Baltazar, 1972: 275 [replacement name] n.syn.–Shenefelt, 1978: 1800.

Material examined. HOLOTYPE female of *dubitorius* with no data (BMNH; Banks Collection). HOLOTYPE female of *transiens* labelled "*Iphiaulax transiens* Type Turn.", "Type H.T." & "B.M. TYPE HYM. 3.c. 366" (BMNH; 3.c. 366).

New South Wales: 1 female, Trial Bay, Dec. 1929 (AM). Northern Territory: 1 male, "The Esplanade", Darwin, Aug. 1970 (AM); 1 male, Oenpelli, June 1973 (ANIC); 1 female, Mount Cahill, June 1973 (ANIC); 1 female, Mudginbarry, June 1973 (ANIC); 1 female, Baroooola, Apr. 1976 (ANIC); 1 male, Rimbija Island, Wessel Islands, Feb. 1972 (ANIC); 1 male, Borradaile, Nov. 1972 (ANIC); 1 female, Darwin, Oct. 1972 (ANIC); 1 female, Holme's Jungle, Berrimah, July 1979 (QM); 1 female, Port Darwin, no date (BMNH). Queensland: 2 females,

Ayr, Sept. 1950 (ANIC); 1 female, Biggenden, May 1973 (ANIC); 1 female, Bin Bin Range, Jan. 1975 (ANIC); 1 female, Bluff Range, Apr. 1975 (ANIC); 1 male, Bluff Range, Nov. 1976 (ANIC); 1 male, Bundaberg, Nov. 1971 (ANIC); 1 male, Bundaberg, June 1972 (ANIC); 1 female, Bundaberg, July 1972 (ANIC); 1 male, Forty Mile Scrub National Park, July 1986 (ANIC); 1 male, Heron Island, May 1978 (ANIC); 1 female, Laura, June 1975 (ANIC); 1 female, Laura, June 1976 (ANIC); 1 male, Burleigh, Sept. 1940 (DPIB); 1 male, Mackay, Apr. 1879 (ANIC); 1 male, Mackay, July 1918 (ANIC); 1 female, Mossman, July 1971 (ANIC); 5 males, 1 female, Sue (Warraber) Island, Dec. 1977 (ANIC); 1 female, Sue Island, May 1985 (QC); 1 male, Ingham, Mar. 1961 (ANIC); 1 male, Thursday Island, "open forest", Nov. 1976 (ANIC); 1 male, Charters Towers, "on rough lemon", June 1959 (ANIC); 1 male, Cordeles, May 1958 (ANIC); 1 female, Electra, Nov. 1976 (ANIC); 1 female, Koah, "citrus orchard", Mar. 1976 (DPIB); 1 female, Halifax, May 1919 (BMH); 6 females, Halifax, June 1919 (BMH); 1 female, Halifax, July 1919 (BMH); 12 females, 5 males, Mackay, 1909 (BMNH); 6

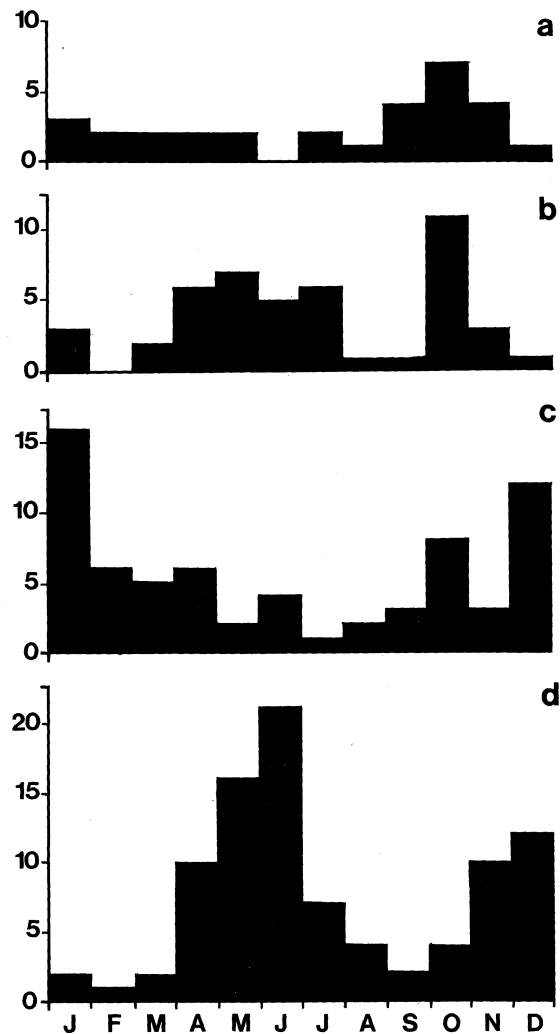


Fig.5. Collection date histograms – a, *I. australiensis*; b, *I. proficiscator*; c, *I. rufus*; d, *I. dubitorius*. Note: specimens with collection dates spanning more than one calendar month not included.

females, 1 male, Kuranda, May–June 1913 (BMNH); 1 male, Kuranda, June 4 (BMNH); 2 females, Desailly Creek, 10 km west by north of Mount Carbine, May 1981 (QC); 1 female, Yeppoon, Dec. 1969 (QC); 1 male, Mount Webb, Oct. 1980 (QC); 1 female, Mount Webb National Park, Apr. 1981 (QC); 1 female, Atherton, Dec. 1959 (QC); 1 female, Mount Cook National Park, Oct. 1980 (QC); 1 male, Dunk Island, Sept. 1927 (QM); 1 male, Dent Island, July 1980 (QU); 1 male, Dent Island, Aug. 1980 (QU); 1 female, Saint Lucia, Apr. 1957 (QU); 1 female, Millaroo, Nov. 1965 (QU); 2 males, Yeppoon, Dec. 1979. Western Australia: 1 female, Cape Bertholet, Apr. 1977 (ANIC); 1 male, Drysdale River, Aug. 1975 (ANIC); 1 female, Mitchell Plateau, May 1983 (ANIC); 1 male, 1 female, Marun, June 1988 (ANIC); 1 female, Morgan Falls, Aug. 1975 (ANIC).

Description. *Female.* Length of body 5.0–10.0 mm, of forewing 5.5–11.0 mm and ovipositor (part exerted beyond the apex of the metasoma) 1.8–2.6 mm. Antennae with approximately 83 flagellomeres. Tentorial ratio = 1.0:3.5:1.25. Face moderately densely long setose, with deep punctures at bases of setae. Facial ratio = 1.0:1.82. Frons glabrous, broadly, shallowly impressed with deep midlongitudinal sulcus. Ocellar ratio = 1.18:1.0:1.82. Mesosoma 1.75 times longer than high. Notauli very weakly impressed, indicated by few setae. Scutellar sulcus narrow with few weak transverse carinae. Propodeum moderately densely long setose laterally, sparsely setose medially. Radial sector ratio = 4.15:3.0:1.0. Submarginal cell ratio = 1.0:2.0:1.0. Pterostigmal index = 2.6.

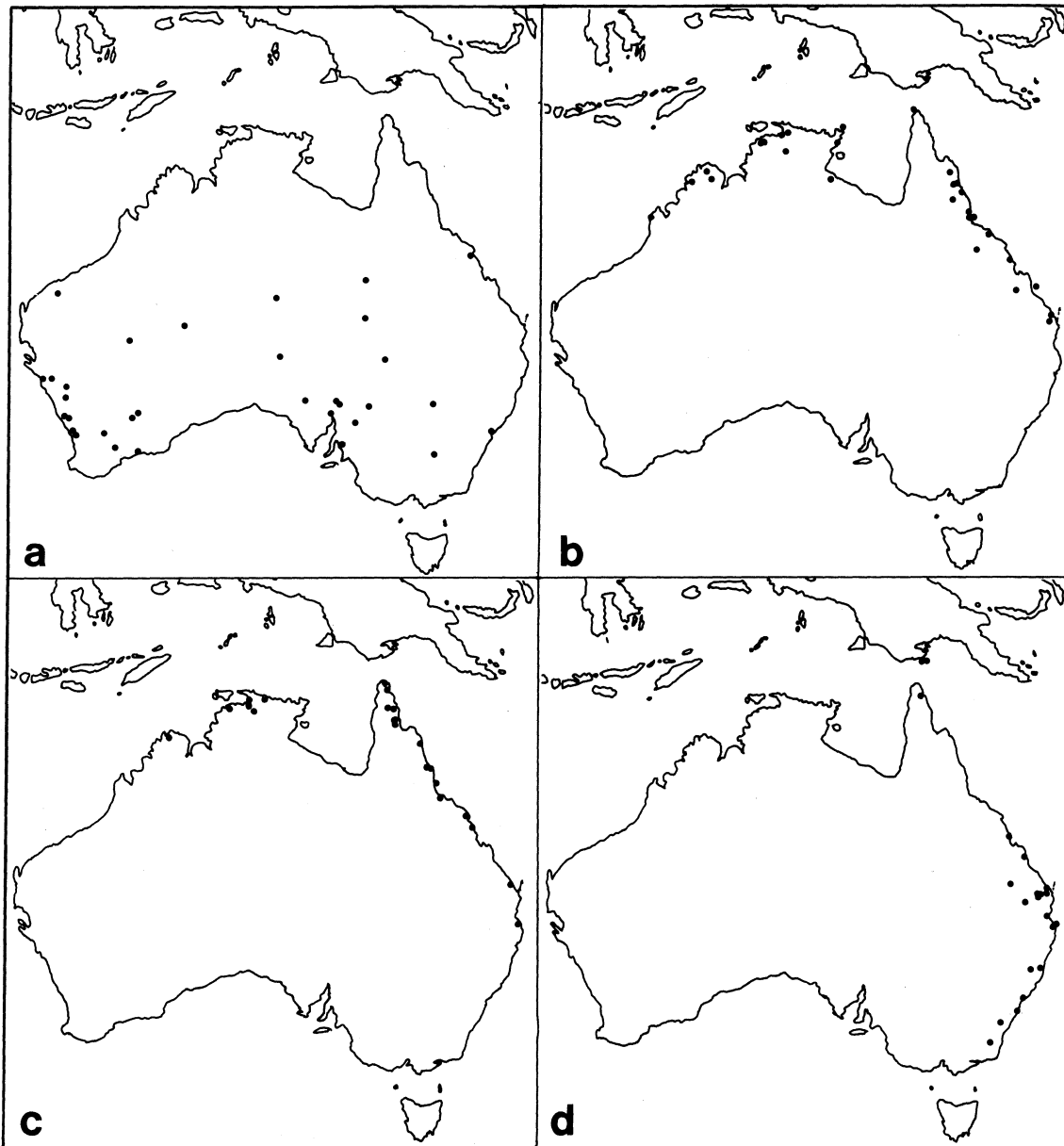


Fig.6. Distribution maps – a, *I. australiensis*; b, *I. dubitorius*; c, *I. proficiscator*; d, *I. rufus*.

Vein 1-SR+M straight. Vein 3-CU1 not expanded posteriorly. Vein cu-a interstitial. Hindwing vein ratio = 1.1. Apex of vein C+SC+R with 4 to 6 thickened setae. Fore leg ratio = 1.0:1.05:1.45. Hind leg ratio = 1.85:2.64:1.0. Hind basitarsal index = 5.0. First metasomal tergite 1.28 times longer than apically wide, without sculpture apart from a few small punctures at the bases of setae. Second tergite approximately 2.3 times wider than medially long. Second suture sinuous and coarsely crenulate. Third to fifth tergites with smooth, transverse, subposterior grooves. Fourth and fifth tergites with crenulate, transverse, sub-basal grooves. Ovipositor, (exserted part) approximately 1.4 times longer than syntergite 2 + 3; maximum depth approximately 0.7 times diameter of basal flagellomeres. Yellow to pale orange-yellow except for the following which are black: antennae, head (except for labiomaxillary complex and palps) mesoscutum, posterior three quarters of the mesopleuron + mesosternum, metasternum, propodeum (except for a medio-posterior mark and a narrow posterior margin), metasomal tergites 5-7, hind femur (excluding trochantellus) distal half of hind tibia, hind tarsus, and ovipositor sheaths. Wings pale yellow except for the apical third which is brown and a narrow transverse band on the forewing at the level of the parastigma.

Male. Generally smaller than females but otherwise similar. Genitalia with an elongate but not medially produced basal ring. Parameres with a band of setae extending around the apex to approximately half way along the ventral edge. Volsellae narrowly setose medially. Digitus weakly concave dorsally, with small, apical tooth-like process.

Notes. *Iphiaulax dubitorius* appears to have a rather northern distribution with few records from far inland (Fig.6b) and collection dates indicate that it may have two main periods of abundance, one around May and June and a second around November and December (Fig.5d).

Iphiaulax innotatus (Turner) n.comb.

Fig.1b

Cyanopterus innotatus Turner, 1918: 95.—Parrott, 1953: 206.—Shenefelt, 1978: 1680.

Material examined. HOLOTYPE female labelled "*Cyanopterus innotatus* Type Turn.", "B.M.TYPE HYM. 3.c 584", "Cairns, Kur. 1.02" & "1909-45" (BMNH; 3.c 584).

Queensland: 1 female, Dunk Island, Aug. 1927 (QM); 3 females, Dunk Island, Aug. 1927 (QU); 2 females, Redlynch, Sept. 1938 (BMNH).

Description. *Female.* Length of body 8-11 mm, of forewing 9-11.5 mm and of ovipositor (part exserted

beyond the apex of the metasoma) 4.5-5.5 mm. Antennae with approximately 90 flagellomeres. Terminal flagellomere strongly acuminate. Tentorial ratio = 1.0:3.7:2.2. Face rather densely setose except medially, smooth and shiny between the small punctures at the bases of the setae. Facial ratio = 1.0:2.0:1.0. Frons glabrous, broadly, shallowly impressed with a deep midlongitudinal sulcus. Ocellar ratio = 1.2:1.0:3.0. Mesosoma 1.66 times longer than high. Notauli weakly impressed at anterior of mesoscutum. Scutellar sulcus with numerous fine transverse carinae. Propodeum sparsely long setose medially, more densely so laterally. Radial sector ratio = 4.5:3.3:1.0. Submarginal cell ratio = 1.19:2.41:1.0. Pterostigmal index = 3.0. = Vein 3-CU1 not expanded posteriorly. Vein cu-a marginally postfurcal, straight. Hindwing vein ratio = 1.0:1.0. Apex of vein C+SC+R with 5 thickened setae. Fore leg ratio = 1.0:1.03:1.45. Hind leg ratio = 1.9:2.8:1.0. Hind basitarsal index = 5.2. Metasoma smooth and shiny. First metasomal tergite 1.58 times longer than maximally wide; without sculpture. Second tergite approximately 2.4 times wider than medially long. Second suture sinuous, without sculpture. Posterior margin of third to fifth tergites with a smooth, narrow, transverse subposterior groove, that of the third tergite being weaker. Ovipositor approximately 3 times longer than syntergite 2+3; maximum depth approximately equal to diameter of basal flagellomeres. Dull orange-red (the metasoma somewhat more yellow), except antennae and head (excluding palps), hind tarsi and ovipositor sheaths which are black. Wings medium to dark brown, basal three quarters of pterostigma yellow and a posteriorly narrowing area below this nearly clear.

Male. Unknown.

Notes. The few specimens of this species indicate that it may be restricted to North Queensland, and in particular, its offshore islands. No specimens from outside of Australia that can be unambiguously assigned to this species have been seen, though similar species are found in Papua New Guinea.

Iphiaulax latistigma n.sp.

Fig.1a

Material examined. HOLOTYPE female labelled "Guadalcanal I. 1.27-31 Sol.Is.", "J.A.Kusche Coll" & "Collection of W.M. Giffard" (BMH). [Left forewing detached]. PARATYPES: 1 female, labelled "Cairns. Q. 9-20", "J.A. Kusche Coll" & "Collection of W.M. Giffard" [Left forewing missing] (BMH). 1 female labelled "SOLOMON Is. Guadalcanal, Lunga May-June 1935 R.A. Lever" (QC, ex-BMNH).

Additional material (not included in paratype series). Solomons: 1 female, Lavoro Plantation, Guadalcanal Island, - 26.-27 (AM); 1 male, Lunga, Guadalcanal Island, no date (BMNH).

Description. *Female.* Length of body 11.5-12.5 mm, of forewing 12.5-13.8 mm and ovipositor (part extending beyond apex of the metasoma) 3.8-5.5 mm. Face moderately setose with punctate sculpture superimposed on a coriaceous background. Tentorial index = 1.0:3.1:2.0. Facial index = 1.0:2.1:1.1. Frons glabrous, broadly generally impressed with moderately well-developed midlongitudinal sulcus. Ocellar ratio = 1.0:1.1:2.35. Metasoma approximately 1.78 times longer than high. Scutellar sulcus narrow and crenulate. Propodeum densely setose laterally, sparsely setose medially. Radial sector ratio = 8.07:5.4:1.0. Submarginal cell ratio = 1.0:2.8:1.2. Pterostigmal index approximately 2.0. Vein 1-SR+M more or less straight. Vein cu-a postfurcal. Hind wing vein ratio = 1.0:1.1. Apex of vein C+SC+R with 6-8 especially thickened bristles. Fore leg ratio = 1.0:1.15:1.48. Hind leg ratio = 1.72:2.52:1.0. Hind basitarsal index = 5.3. Metasoma smooth and shiny. First tergite 1.4 times longer than maximally wide, without a median carina. Second tergite approximately 2.6 times longer than maximally wide. Second metasomal suture smooth. Posterior margin of fourth and fifth tergites with a transverse subposterior groove (third tergite sometimes with a trace of a groove). Ovipositor approximately 1.5 times longer than syntergite 2+3; maximum depth 0.7-1.0 times the diameter of the basal flagellomere. Dull orange-red except for the following which are black or piceous red: antenna, head (including labio-maxillary complex but excluding palps), metasoma, hind tibia and tarsus and ovipositor sheaths; the propodeum and metapleuron are sometimes piceous. Palps yellowish brown. Wings medium-brown except for the extreme base which is orangish, the pterostigma which is cream or ivory white and a small area below the pterostigma which is more or less clear.

Male. Similar to female but rather smaller.

Notes. *Iphiaulax latistigma* n.sp. appears to be one of the common braconines in the Solomon Islands (though previously undescribed) and the colour pattern it displays is characteristic of larger braconines from those islands (see Cameron, 1911) and from the south of Papua New Guinea. It is possible therefore that the data on the BMH specimen (the only one apparently from Australia) is erroneous or, at least, that *I. latistigma* is not endemic to Australia. It is included here in case it does and because it is an undescribed yet obviously common species in the Solomons.

Etymology. Name refers to the broad pterostigma.

Iphiaulax profiscicator (Fabricius)

Figs 1e, 5b, 6c

Ichneumon profiscicator Fabricius, 1775: 335.—Fabricius, 1781: 428.—Gmelin, 1790: 2689.—Fabricius, 1793: 153.—Zimsen, 1964: 372.
Ichneumon profiscicator [sic.]—Fabricius, 1787: 264.

Bracon profiscicator.—Fabricius, 1804: 105.—Dalla Torre, 1898: 285 [includes old references].—Szépligeti, 1904: 37.

Cyanopterus profiscicator [sic.]—Turner, 1918: 94–95.

Cyanopterus profiscicator.—Turner, 1919: 231.—Shenefelt, 1978: 1681.—Parrott, 1953: 207.

Iphiaulax profiscicator.—Quicke, 1988c: 201.

Ichneumon hospikator.—Fabricius, 1775: 335 n.syn.

Bracon hospitor [sic.]—Fabricius, 1804: 106.

Bracon hospikator.—Dalla Torre, 1898: 272.—Szépligeti, 1904: 37.—Parrott, 1953: 205.—Shenefelt, 1978: 1492.

Iphiaulax hospikator.—Quicke n.comb.

Material examined. HOLOTYPE female of *profiscicator*, no data (BMNH; Banks Collection). HOLOTYPE male of *hospikator*, no data (BMNH; Banks Collection).

Northern Territory: 1 female, Baroalba Creek, Oct. 1972 (ANIC); 1 male, 1 female, Cahills Crossing, Alligator River, Oct. 1972 (ANIC); 1 female, Coastal Plains Research Stn, Lower Adelaide River, "Pupa in bored-out stem of *Mimosa pigra*. Parasite of cerambycid? Emg. 18. Nov. 1985", Nov. 1985 (ANIC); 2 females, Maningrida, Mar. 1961 (BMH); 1 male, Mudginbary, Nov. 1972 (ANIC); 1 male, Mudginbary, June 1973 (ANIC); 1 female, Port Darwin, no date (BMNH); 1 male, West Alligator Mouth, July 1979 (QM). Queensland: 1 female, Box Creek, Proserpine, no date (AM); 1 female, Cairns, Dec. 1951 (AM); 1 female, Finch's Bay, Cooktown, June 1951 (AM); 2 females, Iron Range, ? 1947 (AM); 1 female, Mount Lamond, Iron Range, Jan. 1972 (AM); 2 females, 4 males, Bundaberg, "in mangroves", Oct. 1977 (ANIC); 1 male, Bundaberg, Oct. 1972 (ANIC); 1 male, Bundaberg, Jan. 1973 (ANIC); 1 male, Bundaberg, Jan. 1978 (ANIC); 1 female, Cape York, Apr. 1902 (ANIC); 1 female, Cape York, May 1902 (BMNH); 1 male, Mount Walsh National Park, Aug. 1977 (ANIC); 1 female, Mount Tozer Area, Apr. 1973 (ANIC); 1 female, Leo Creek Road, McIlwraith Range, "c. 500m", July 1976 (ANIC); 1 female, Stewart River, Coen, June 1976 (ANIC); 1 male, Somerset, Apr. 1973 (ANIC); 2 females, Lockerbie Area, Apr. 1973 (ANIC); 1 male, Gunshot Creek, July 1975 (ANIC); 1 female, Captain Billy Creek, July 1975 (ANIC); 1 male, Pinnacle Creek, 27 km north of Archer Crossing, June 1975 (ANIC); 1 female, Capsize Creek, 64 km north of Archer Crossing, June 1975 (ANIC); 1 female, Iron Range, Apr. 1964 (ANIC); 1 female, Iron Range, May 1971 (ANIC); 4 females, 1 male, Mackay, ? 1909 (BMNH); 2 females, Mackay, May 1934 (QM); 1 female, Kuranda, May-June 1913 (BMNH); 1 female, Sue Island, May 1985 (QC; ex DPIB); 1 female, Dunk Island, May 1914 (QM); 1 male, Townsville, no date (QM); 1 female, Brisbane, May 1951 (QU); 1 male, Brisbane, "in mangrove", Nov. 1957 (QU); 1 female, Brisbane, Sept. 1961 (QU). Western Australia: 1 male, Carson Escarpment, July 1975 (ANIC); 1 male, Drysdale River, July 1975 (ANIC).

Description. *Females.* Length of body 10-12 mm, of forewing 9.0-11.8 mm and of ovipositor (part exerted beyond apex of metasoma) 3.5-4.6 mm. Antennae with approximately 90 flagellomeres. First flagellomere 1.43 and 1.5 times longer than the second and third flagellomeres respectively, the latter being 1.2 times wider than long. Tentorial ratio = 1.0:3.53:2.16. Facial ratio

= 1.0:2.1:1.1. Frons deeply broadly impressed with a weak midlongitudinal suture. Ocellar ratio = 1.0:1.4:2.6. Mesosoma approximately 1.6 x longer than high. Scutellar sulcus crenulate. Radial sector ratio = 5.48:4.19:1.0. Submarginal cell ratio = 1.0:2.4:1.2. Pterostigmal index = 2.75-2.85. Vein 1-SR+M virtually straight. Vein 3-CU1 not expanded posteriorly. Vein cu-a interstitial, straight. Hind wing vein ratio = 1.0:1.1. Apex of hindwing vein C+SC+R with 5-7 especially thickened bristles. Fore leg ratio = 1.0:1.08:1.6. Hind leg ratio = 1.8:2.8:1.0. Hind basitarsal index = 4.8. Metasoma smooth and shiny. First metasomal tergite approximately 1.36 times longer than maximally wide; without sculpture. Second tergite approximately 2.4 times wider than medially long. Second suture smooth. Ovipositor approximately 0.4 times forewing length; maximum depth 1.1-1.3 times diameter of basal flagellomeres. Orange-yellow to orange except for the following which are black or piceous: antennae, head (except palps), apex of hind tibia, hind tarsus and ovipositor sheaths. Basal two fifths of forewing yellow, apex brown except for the pterostigma which is yellow and a broad band below the pterostigma which is largely yellow. Basal three fifths of hindwing yellow, remainder brown.

Male. Similar to female. Metasomal tergites 6 and 7 often somewhat piceous.

Notes. This species appears to have a principally northern and north-eastern coastal distribution (Fig.6c) and collection data histograms indicate two periods of abundance, the first from April to July and a second around the October–November period (Fig.5b).

Iphiaulax rufus Szépligeti

Figs 1d, 2c, 5c, 6d

Iphiaulax rufus Szépligeti, 1901: 397.–Szépligeti, 1904: 23.–Szépligeti, 1905: 35.
Cyanopterus rufus.–Szépligeti, 1906: 586.–Turner, 1918: 231.–Tillyard, 1926: 269.–Parrott, 1953: 207.–Shenefelt, 1978: 1681.

Material examined. HOLOTYPE female, labelled "*I. rufus* det. Szépligeti", "Holotype female *Iphiaulax rufus* Szépl. 1901, Papp '69", "Hym. Typ. No. 1207 Mus. Budapest" (HNHM).

New South Wales: 1 female, Cowan, Sydney, Feb. 1947 (AM); 1 female, Coal & Candle Creek, Jan. 1946 (AM); 1 female, Mount Tomah, Jan. 1978 (AM); 2 females, Bilpin, Jan. 1978 (AM); 1 male, 1 female, Lorien Wild, Jan. 1987 (AM); 1 male, Wollombi, Ebor District, Mar. 1987 (AM); 1 female, Manly, Dec. 1907 (AM); 1 female, Harrington, Jan. 1986 (AM); 1 female, Crowdy Head, "Ex *Acacia saphonae* on beach hind dune zone", Sept. 1985 (AM); 1 female, Maitland Bay, Jan. 1988 (AM); 1 female, Narrabeen, Feb. 1936 (ANIC); 1 male, 1 female, Sawtell, Apr. 1968 (ANIC); 1 female, Greta, ? 1951 (BMH). Queensland: 1 female, Carnarvon Range, Dec. 1934 (AM); 1 female, Yeppoon, Oct. 1924 (AM); 1 male,

Yeppoon, Oct. 1924 (QM); 1 female, Miles, Jan. 1939 (AM); 1 female, Murray Island, Torres Strait, no date (AM); 1 female, Claudie River, near Mount Lamond, June 1986 (AM); 1 male, Dauan Island, Torres Strait, June 1962 (ANIC); 1 female, Saibai Island, Torres Strait, June 1962 (ANIC); 1 male, Mount Walsh National Park, Jan. 1973 (ANIC); 1 female, Mount Walsh National Park, June 1977 (ANIC); 1 female, 3 males Mount Walsh National Park, Jan. 1978 (ANIC); 1 female, Mount Walsh National Park, Feb. 1979 (ANIC); 1 male, Cordalba State Forest, 29 km south-west of Bundaberg, Oct. 1978 (ANIC); 3 females, Cordalba State Forest, 29 km south-west Bundaberg, Dec. 1979 (ANIC); 1 female, 2 males, Degilbo, Dec. 1978 (ANIC); 1 female, Coast Range, Biggenden, Aug. 1974 (ANIC); 1 female, Coast Range, Biggenden, Feb. 1978 (ANIC); 1 female, Coast Range, Biggenden, Oct. 1979 (ANIC); 1 female, Baldwin Swamp, Bundaberg, Oct. 1977 (ANIC); 1 male, Bundaberg, May 1960 (QC); 1 female, Bundaberg, "in mangroves", Oct. 1977 (ANIC); 1 (sex unknown; metasoma missing), Pine Creek, Bundaberg, no data (ANIC); 2 females, Mundabbera, Apr. 1957 (ANIC); 1 male, Captain Billy Creek, Cape York Peninsula, July 1975 (ANIC); 2 males, Hogback Range, Mar. 1973 (ANIC); 2 males, Bla Bla Range, Dec. 1974 (ANIC); 1 female, Rockpool Gorge, Mar. 1975 (ANIC); 1 female, Summit Mount Walsh, "c. 1000m", Nov. 1976 (ANIC); 1 male, Isis District, near Childress, Sept. 1973 (ANIC); 1 male, Ban Ban Range, Jan. 1974 (ANIC); 1 female, Mount Tozer Area, Apr. 1973 (ANIC); 1 female, Burnett River, Bundaberg, Jan. 1976 (ANIC); 1 male, Burnett River, Bundaberg, Nov. 1976 (ANIC); 1 male, Electra State Forest, Nov. 1976 (ANIC); 1 female, Electra State Forest, Dec. 1976 (ANIC); 1 female, Electra State Forest, Jan. 1977 (ANIC); 1 male, Electra State Forest, Apr. 1977 (ANIC); 2 females, 4 males, Mackay, no date (BMNH); 1 male, Brisbane, May 1909 (QM); 1 female, Brisbane, Dec. 1912 (QM); 1 female, Brisbane, Feb. 1916 (QM); 1 female, Brisbane, Aug. 1923 (QC); 1 female, Stradbroke Island, Sept. 1915 (QC); 1 male, Caloundra, Oct. 1912 (QM).

New Zealand: 1 female, Hunter River, no date (BMNH).

Description. *Female*. Length of body 9.0-12.5 mm, of forewing 9.5-13.5 mm and of ovipositor (part exerted beyond apex of metasoma) 4.0-5.5 mm. Antenna with approximately 100 flagellomeres. Tentorial ratio = 1.0:3.2:2.6. Face moderately densely long setose with distinct punctures at the bases of the setae, coriaceous between these punctures. Facial ratio = 1.0:1.92:1.0. Frons glabrous, moderately deeply impressed behind the antennal sockets with a weak midlongitudinal sulcus. Ocellar ratio = 1.0:1.58:3.55. Mesosoma approximately 1.74 times longer than maximally deep. Notauli almost totally absent. Scutellar sulcus narrow and finely crenulate. Propodeum sparsely long setose medially, densely so laterally. Radial sector ratio = 6.21:4.55:1.0. Submarginal cell ratio = 1.0:2.54:1.0. Pterostigmal index = 2.65. Vein 1-SR+M weakly angled posteriorly shortly after arising from vein 1-SR. Vein cu-a interstitial, evenly curved. Hind wing vein ratio = 1.08:1.0. Apex of hindwing vein C+SC+R with 3 to 6 thickened bristles. Fore leg ratio = 1.0:1.8:1.57. Hind leg ratio = 1.82:2.7:1.0. Hind basitarsal index = 6.3. First metasomal tergite approximately 1.15

times longer than maximally wide; without sculpture. Second tergite 2.2-2.4 times wider than medially long. Second suture sinuous and smooth. Third tergite with at most a weak smooth, transverse, subposterior groove medially. Tergites 4 and 5 with well-developed, smooth, transverse, sub-posterior grooves. Ovipositor (exserted part) approximately 2 times longer than syntergite 2 + 3; maximum depth (preapical) 1.41-1.58 times width of basal flagellomeres. Orange-red (metasoma sometimes somewhat darker), antennae, head, apical 0.2-0.4 of hind tibia, hind tarsus and ovipositor sheaths black. Wings with basal 0.4-0.5 yellow, apical part grey-brown to brown except for the pterostigma (except apex) which is yellow, and a small area below this which is clear.

Male. Similar to female, wings sometimes more palely marked.

Notes. *Iphiaulax rufus* has a principally south-eastern distribution most records being from New South Wales and southern Queensland though a few apparently conspecific individuals have been collected in north Queensland and its off-shore islands (Fig.6d); the record from Hunter River may possibly refer to a locality outside of New Zealand as the country was not specified. Flight activity appears to peak around December and January (Fig.5c).

Species Referrable to Other Genera

Iphiaulax rubriceps Shenefelt

Iphiaulax rubriceps Froggatt, 1916: 564 (non Brethes, 1913: 57).

Iphiaulax rubriceps Shenefelt, 1978: 1692 [replacement name].

Comments. It is clear from the illustrated original description that this species belongs to the doryctine genus *Syngaster* Brullé, hence *Syngaster rubriceps* n.comb.

Iphiaulax trinotata Ashmead

Iphiaulax trinotata Ashmead, 1900: 359.

Comments. I have examined the holotype male of this species which is in the USNM (type No. 4917) and found it to belong to the genus *Bracon* to which it is hereby transferred, hence *Bracon trinotata* (Ashmead) n.comb.

Chaoilta Cameron

Chaoilta Cameron, 1899: 80.

Platybracon Szépligeti, 1900: 49 (*Platybracon depressus* Szépligeti, 1900, monotypy); synonymised by

Roman, 1913.

Blastomorpha Szépligeti, 1900: 50 (*Blastomorpha decorata* Szépligeti, 1900, subsequent designation of Viereck, 1914); synonymised by Quicke, 1981.

Iphiaoilta Ramakrishna Ayyar, 1928: 60d (*Iphiaoilta malabarica* Ramakrishna Ayyar, 1928, original designation); synonymised by Quicke, 1987 on the authority of C. van Achterberg.

Type species. *Chaoilta lammellata* Cameron, 1899, monotypy.

Description. *Female.* Medium to large braconine wasps. Median flagellomeres longer than wide. Basal 1-3 flagellomeres with especially long setae ventrally. Pedicellus petiolate. Scapus highly modified, apicomedial margin with separate large and small concave areas, basally concavely pedicellate. Face with a more or less strongly produced, transverse ledge, with (subgenus *Blastomorpha*) or without (subgenus *Chaoilta*) medial horn-like and distally concave projection above this. Eyes glabrous. Frons broadly impressed. Head elongate (cubicoid). Mesosoma usually more or less strongly dorsoventrally compressed. Forewing vein r-m with 2 bullae. Apex of hindwing vein C+SC+R with 1 especially thickened bristle. Base of hindwing with glabrous area distal to vein cu-a. Fore tarsus at least 1.6 times longer than fore femur (excluding trochantellus). Apicoventral setae of penultimate tarsal article very elongate, extending at least 0.9 of ventral length of telotarsus (excluding claw). Hind femur and tibia with numerous long setae ventrally as well as many shorter ones. First metasomal tergite with wide, flat lateral areas. Second metasomal tergite with well-developed pair of posteriorly diverging grooves and with distinct, acute, striate, midbasal triangular area. Metasomal tergites 3-5 with anterolateral, posteriorly diverging grooves. Ovipositor shorter than forewing; with preapical dorsal nodus and apicoventral serrations.

Male. As for females except facial protuberance usually less well developed, and apicoventral tarsal bristles not so elongate. With pair of large sac-like intertergal glands between seventh and eighth abdominal tergites and with pair of tubular glands opening at pore on eighth abdominal (seventh metasomal) tergite close to its anterolateral corners (Quicke, in press). Rectum fused to eighth abdominal tergite.

Notes. The genus *Blastomorpha* was erected by Szépligeti (1900) for those species which possess a horn-like process above the facial lamellum. Although in *Chaoilta sensu stricto* there is often a more or less protruding, mid-longitudinal ridge running along the facial lamellum, the condition in *Blastomorpha* species is distinct in that the horn-like process is not a simple projection of the carina but has a distinct concave apical area. The author has seen several species with this modification and therefore considers that these should be recognised as belonging to a separate subgenus, *Chaoilta* (*Blastomorpha*) n.stat. to distinguish them from

those species with only a simple cariniform protruberance, *Chaoilta* (*Chaoilta*).

Biology. *Chaoilta* belongs to the *Atanycolus* group of genera (Quicke, 1987), members of which have most frequently been reared from beetle larvae which bore

just under tree bark, notably species of Buprestidae. Unfortunately there are no host records for Australian species of *Chaoilta* but one Indo-Australian species has been recorded from "large bark-boring beetle larvae" (Quicke, 1988b), indicating that beetle larvae such as Buprestidae are the probable hosts.

Key to Australian Species of *Chaoilta*

- 1. Face with a horn-like structure above the protruding transverse lamella (Fig.7a,b); metasomal tergites all black; pronotum strongly emarginate medioanteriorly (Fig.7c).....*C. (Blastomorpha) decorata*
- Facial lamella at most with a midlongitudinal carina dorsally (Figs 7d, 8a,b); metasomal tergites 1-4 brownish yellow to brownish orange, tergites 5-7 yellow brown or black; pronotum less strongly emarginate medioanteriorly (Figs 7f, 8h) (*C. (Chaoilta)*)2
- 2. Mesoscutum, scutellum, mesosternum, mid and hind coxae, trochanters and femora largely black; fourth metasomal tergite largely without sculpture (Fig.8f); posterodorsal part of pronotum sparsely setose (Fig.7g).....*C. hollowayi* n.sp.
- Mesoscutum, scutellum, mesosternum, mid and hind coxae, trochanters and femora entirely brownish yellow; fourth metasomal tergite extensively longitudinally striate (Fig. 8a,b); posterodorsal part of pronotum more extensively setose (Fig.8e,g) 3
- 3. Head black; hind tarsus black except for extreme base *C. nigriceps*
- Head and hind tarsus (except for telotarsus) brownish yellow4
- 4. Wing membrane brown except for clear and yellow markings posterior to pterostigma (Fig.8d) *C. insularis*
- Wing membrane yellow for at least basal half of median and submedian cells of forewing (see Fig. 8c) *C. lutea*

***Chaoilta (Blastomorpha) decorata* (Szépligeti)**

Fig.7a-c

Blastomorpha decorata Szépligeti, 1900: 50.—Kohl, 1907: 290.

Chaoilta decorata.—Szépligeti, 1904: 17.—Turner, 1917: 241.—Shenefelt, 1978: 1667.

Material examined. HOLOTYPE female from Papua New Guinea labelled "Mafor Fruhstorfer", "H. Type No 850. Museum Budapest" (HNHM).

Queensland: 3 females, Claudie River 5 km west of Mount Lamond, Jan. 1972 (AM); 1 (sex unknown, metasoma missing), Cooktown, Nov. 1904 (BMNH); 1 female, Gordon Creek area, Claudie River district, July 1982 (QU); 2 females, Iron Range, June 1971 (ANIC); 1 female, Iron Range, Apr.–May 1973 (ANIC); 1 female, Iron Range, Mar. 1975 (DPIB); 2 females, Iron Range, June–July 1981 (ANIC); 2 females, McIvor River Crossing, 40 km north of Cooktown, Aug. 1976 (ANIC); 1 male, Mount Tozer near Iron Range National Park, June–July 1986 (ANIC).

Papua New Guinea: 1 female, Bulolo, 700 m, Nov. 1957 (BMH); 2 females, Bulolo River, 700 m, Feb. 1969

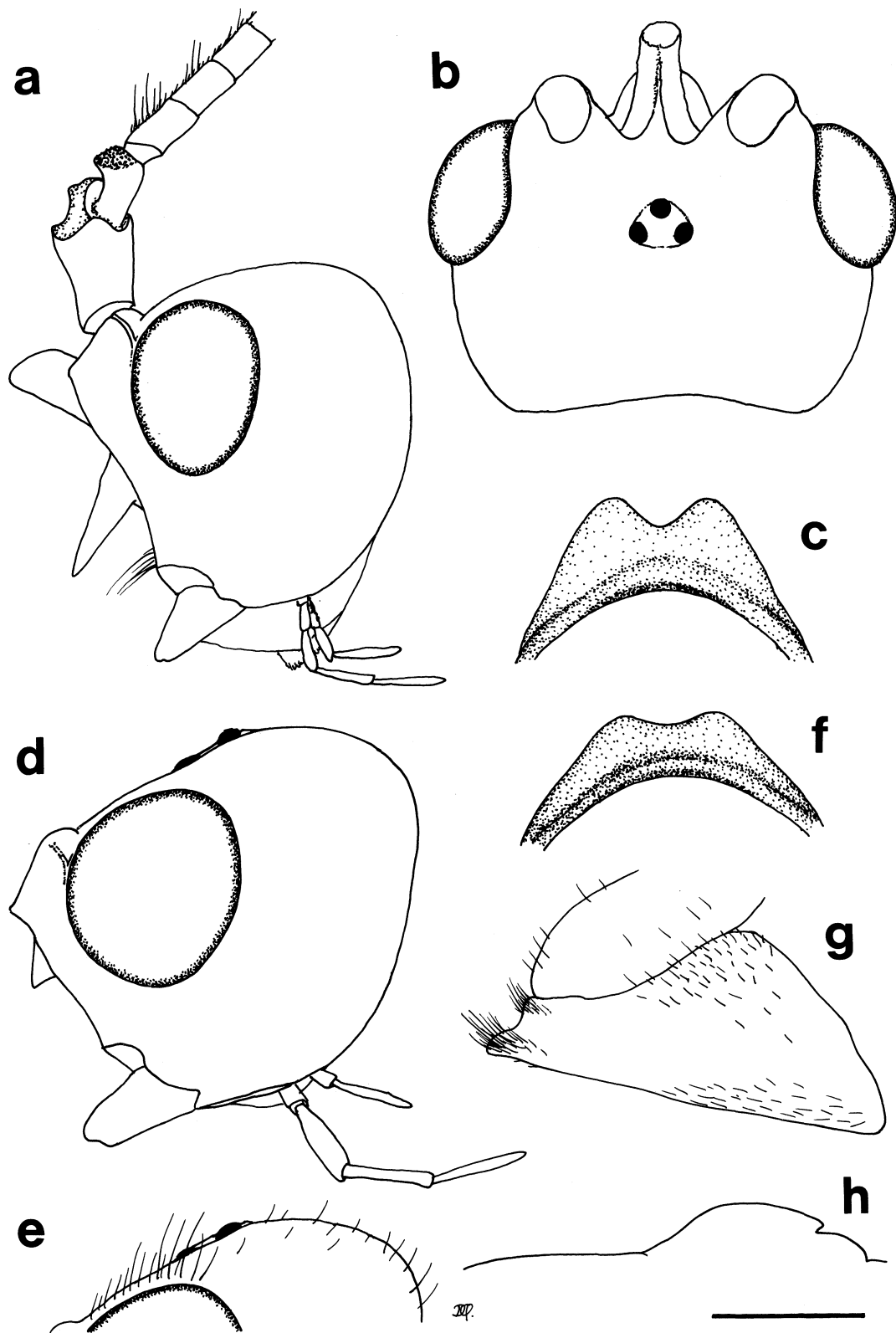


Fig.7. a–c, *Chaoilta (Blastomorpha) decorata*: a, head and base of antenna, lateral aspect; b, head, dorsal aspect; c, pronotum, dorsal aspect. d–h, *Chaoilta (Chaoilta) hollowayi* n.sp.: d, head, lateral aspect; e, top of head showing long setae at edge of frons; f, pronotum, dorsal aspect; g, pronotum, lateral aspect; h, scutellum, left profile. Scale bar: a,b, 1.0 mm; c,g, 0.75 mm; d–f, 0.5 mm; h, 0.4 mm.

(BMH); 1 female, Green River/Sepik River Junction, 200 m, June 1963 (BMH); 1 female, north-east of Garaina, 550-750 m, Jan. 1968 (BMH); 3 females, Kiunga, Fly River, Aug. 1957 (BMH); 3 females, Kiunga, Fly River, 35 m, Aug. 1969 (BMH); 1 female, Kuper Range, 25 km south-east of Salamaua, Jan. 1969 (BMH); 1 female, Popondetta, June 1966, "light trap" (BMH).

No data: 1 female, (QM).

Description. *Female.* Length of body 12-18 mm, of forewing 11-16 mm, and of ovipositor (exserted part) 14-21 mm. Antennae with approximately 60 flagellomeres. Basal 3 flagellomeres with long apicoventral setae. First flagellomere 1.13 and 1.3 times longer than the second and third respectively, the latter being 1.18 times longer than wide. Inter-tentorial distance: tentorio-ocular distance = 1.0 : 1.16-1.17. Face with an extremely strong, distinctly down-curved, plate-like protuberance and with long, apically obtuse, horn-like process above this. Frons extensively sparsely short setose. Ocellar ratio = 1.0:1.0:5.7. Head index = 0.82-1.04. Mesosoma approximately 2.15 times longer than high. Pronotum strongly emarginate medioanteriorly in dorsal aspect; posterodorsally extensively, moderately-densely setose. Scutellar sulcus finely crenulate. Propodeum without striations; smooth and shiny. Radial sector ratio = 5.8:5.6:1.0. Submarginal cell ratio = 1.0:2.47:1.0. Vein 1-SR+M moderately strongly curved posteriorly. Hindwing-hindwing vein ratio = 1.4:1.0. Fore leg ratio = 1.0:1.1:2.0. Fore basitarsal index = 6.5. Hind leg ratio = 1.36:2.27:1.0. Hind basitarsal index = 5.7. Metasoma moderately strongly sculptured basally, smooth but densely setose apically. First tergite slightly longer than maximally wide, the lateral areas longitudinally striate, the raised median area striate to foveate posteriorly. Second tergite 2 times wider than medially long; longitudinally striate medially, confused striate-rugose laterally. Third tergite at most striate basally, remainder of tergite and subsequent ones smooth but densely setose and with distinct punctures at bases of setae. Ovipositor approximately 1.35 times length of forewing. Orange-red to brown-red, except head which is yellow and flagellum, hind tibia and tarsus, metasoma and ovipositor sheaths which are black. Wings dark brown except for pterostigma which is yellow and flexion line between apex of parastigma and base of second subdiscal cell which is clear.

Male. Very similar to female.

Notes. This species is common in Papua New Guinea and North Queensland.

***Chaoilta (Chaoilta) hollowayi* n.sp.**

Figs 7d-h, 8f

Material examined. HOLOTYPE female labelled "North Slope, Bluff Ra., Biggenden, Qld, 10 May 1973 H. Frauca" (ANIC). PARATYPES - New South Wales: 2 males, 2 females, Baradine, May 1954 (ANIC); 1 male, Mount Harris, Sept. 1982 (AM). Queensland: 1 female, Amby,

Nov. 1979 (QU); 1 female, Cunnamulla, Apr. 1942 (AM); 1 female, Duinga District, Jan. 1940 (AM); 1 female, no locality or date (AM). Western Australia: 1 female, Beverley, Mar. 1914 (ANIC); 1 female, Cadoux, Oct. 1981 (WAM).

Description. *Female.* Length of body 7.5-9.5 mm, of forewing 8.5-9.0 mm, of antennae 7.7-8.25 mm and of ovipositor (part exserted beyond apex of metasoma) 7.5-8.0 mm. Antennae with 51 flagellomeres. First flagellomere 1.27 and 1.18 times longer than second and third respectively, latter being 1.5 times longer than wide. Inter-tentorial distance: tentorio-ocular distance = 1.2:1.0. Face with a moderately developed transverse protrusion. Dorsal side of protrusion with a midlongitudinal carina bordered by crenulae. Facial ratio = 1.22:2.28:1.0. Frons largely glabrous except for 2 rows of rather long setae close to eye. Ocellar ratio = 1.7:1.0:5.3. Head index = 0.88-1.1. Mesosoma 2.0-2.6 times longer than high. Pronotum only weakly emarginate apicomediaally; sparsely setose posterodorsally. Scutellum usually rather strongly arched in profile (less so in more dorsoventrally compressed specimens). Propodeum smooth or finely, longitudinally striate medio-posteriorly. Radial sector ratio = 6.8:4.25:1.0. Submarginal cell ratio = 1.0:2.47:1.0. Hindwing vein ratio = 1.0:1.8. Fore leg ratio = 1.05:1.0:1.67. Fore basitarsal index = 6.5. Hind leg ratio = 1.43:2.32:1.0. Hind basitarsal index = 6.3. Metasoma largely with confused longitudinal striation anteriorly, smooth posteriorly. First tergite marginally longer than posteriorly wide; lateral areas smooth, raised median area largely longitudinally striate. Second tergite 2.6-2.8 times wider than medially long. Second and third tergites largely longitudinally striate. Fourth and subsequent tergites smooth except for some microsculpture and the crenulate, transverse, subposterior grooves; moderately setose. Ovipositor approximately 0.8 times length of forewing. Ochreous yellow except for the following which are black or piceous brown: antennae, tips of mandibles, stemmaticum, posterior part of pronotum, mesothorax, metanotum, part of metapleuron, coxae, trochanters, variable amounts of femora, apex of hind tibia, hind tarsus, metasomal tergites 5-7, metasomal sternites and hypopygium, ovipositor sheaths. Posterior margin of tergite 6 white. Basal third of wings yellow, apical two thirds grey-brown to dark brown except for the pterostigma which is yellow.

Etymology. Named in honour of Geoff Holloway.

Notes. An entirely Australian species known so far from New South Wales, Queensland and Western Australia.

***Chaoilta (Chaoilta) insularis* (Cameron)**

Fig. 8d,e

Platybracon insularis Cameron, 1911b: 353.-Brues, 1918:

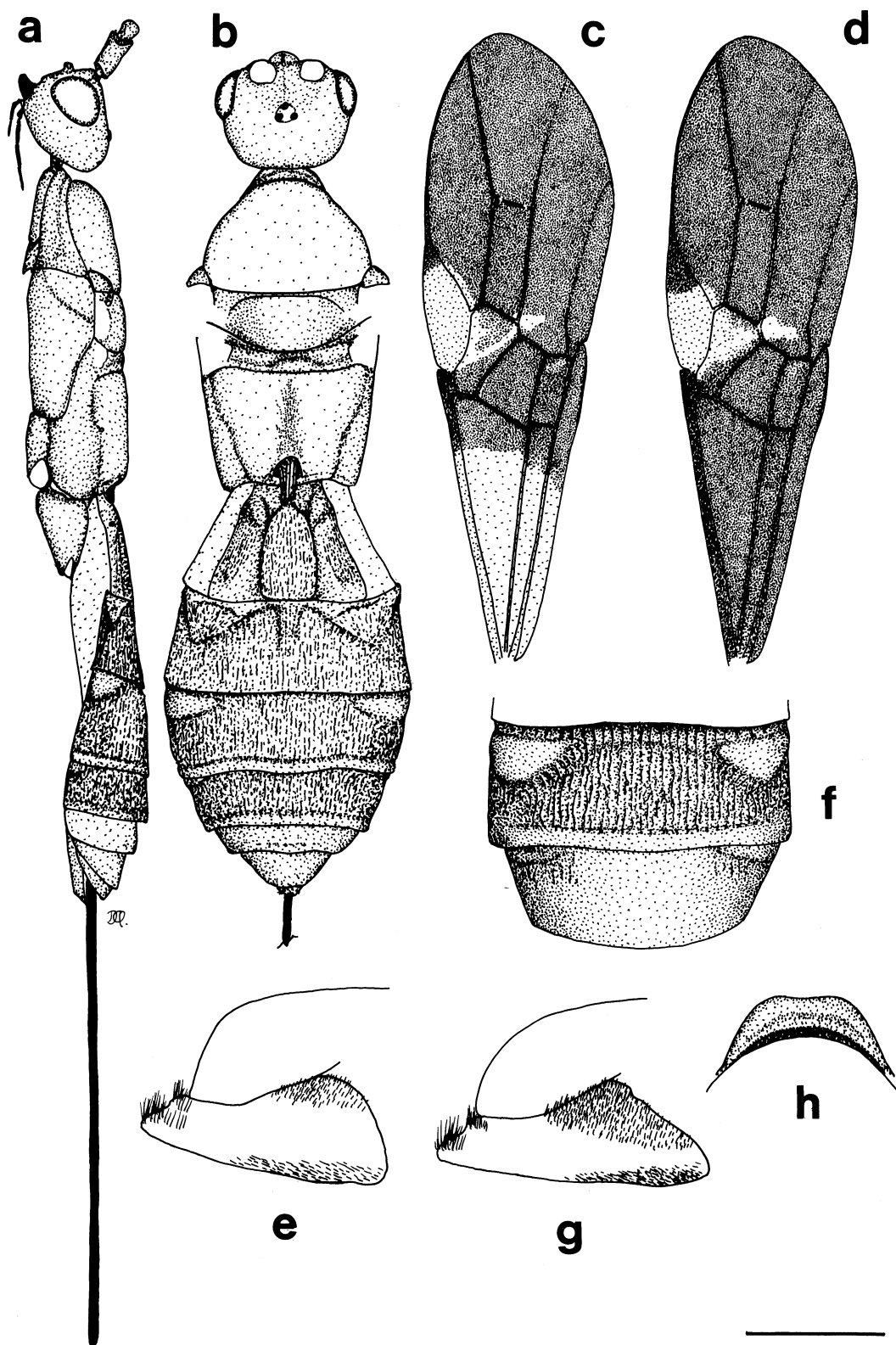


Fig. 8. a-c, *Chaoilta (Chaoilta) nigriceps*: a, habitus, lateral aspect; b, habitus, dorsal aspect; c, right forewing, showing colour pattern. d,e, *Chaoilta (C.) insularis*: d, right forewing showing colour pattern; e, pronotum, lateral aspect. f, *Chaoilta (C.) hollowayi* n.sp., metasomal tergites 3 and 4. g,h, *Chaoilta (C.) lutea*: g, pronotum, lateral aspect; h, pronotum, dorsal aspect. Scale bar: a,b, 2.0 mm; c,d, 2.5 mm; e,g,h 0.9 mm; f, 1.15 mm.

106.

Chaoilta insularis.—Baltazar, 1972: 263.—Shenefelt, 1978: 1668.

Material examined. HOLOTYPE female labelled “*Chaoilta insularis* Cam. type Solomon Islands” (BMNH; 3.c.610).

Queensland: 2 female, Kuranda, Dec. 1951 (AM); 1 female, Kuranda, Nov. 1952 (ANIC); 1 female, Lockerbie Area, Apr. 1973 (ANIC); 1 female, Mareeba, Dec. 1952 (AM).

Description. *Female.* Length of body 8.5-12.0 mm, of forewing 8.5-11.5 mm, and of ovipositor (part exerted beyond apex of metasoma) 5.6-7.3 mm. Antenna with 47-53 flagellomeres. First flagellomere 1.33 and 1.5 times longer than the second and third respectively, the latter being 1.6 times longer than wide. Inter-tentorial distance: tentorio-ocular distance = 1.23:1.0. Face with a moderately well-developed transverse protrusion; dorsal side of protrusion with a midlongitudinal carina. Facial ratio = 1.1:2.2:1.0. Frons rather strongly depressed behind the antennal sockets; broadly with short setosity, and with longer setae close to eye. Ocellar ratio = 1.0:1.05:4.35. Head index = 1.4-1.52. Mesosoma 2.55-3.5 times longer than high. Pronotum weakly emarginate apicomediaally; with a moderately extensive, densely setose area posterodorsally. Scutellar sulcus finely crenulate. Scutellum more or less flat in profile. Propodeum at least with a crenulate posterior margin, usually with a mediolongitudinal, striate band. Radial sector ratio = 7.0:5.5:1.0. Submarginal cell ratio = 1.0:2.7:1.1. Hindwing vein ratio = 1.0:1.47. Fore leg ratio = 1.0:1.05:1.91. Fore basitarsal index = 6.5. Hind leg ratio = 1.45:2.2:1.0. Hind basitarsal index = 6.0. First metasomal tergite 1.1 times wider than maximally long; lateral areas longitudinally striate at least laterally, raised median area longitudinally striate. Second tergite approximately 3.3 times wider than medially long, with a well-defined striate, midbasal, fusiform area; largely with rugose to striate-rugose sculpture. Third and fourth tergites largely with rugose sculpture; subsequent tergites smooth. Ovipositor (exserted part) approximately 0.6 times length of forewing. Brownish yellow to brownish orange (the head sometimes paler yellow) except for the antennae and ovipositor sheaths which are black. Wings grey-brown; basal three quarters of pterostigma yellow.

Notes. Although originally described from the Solomons, the specimens reported here from Australia and Papua New Guinea are apparently conspecific. This species is very close to *C. depressa*.

Chaoilta (Chaoilta) lutea Cameron

Fig. 8g,h

Chaoilta [sic] *lutea* Cameron, 1905a: 102.

Chaoilta lutea.—Cameron, 1905b: 42.—Baltazar, 1972: 264.—

Shenefelt, 1978: 1668.

Material examined. HOLOTYPE female labelled “*Chaoilta lutea* Cam. type. Borneo”, “B.M. TYPE HYM. 3.c.594” and “Cameron Coll. 1906-138” (BMNH).

Queensland: 1 female, Iron Range, June 1971 (ANIC); 1 female, Middle Claudie River, Iron Range, Oct. 1974 (AM).

Description. *Female.* Length of body 10.5-11.5 mm, of forewing 10.0-11.0 mm and of ovipositor (part exerted beyond to apex of the metasoma) 8.0-8.5 mm. Antennae with 58-61 flagellomeres. First flagellomere 1.1 and 1.25 times longer than the second and third respectively, the latter being 1.25 times longer than wide. Inter-tentorial distance: tentorio-ocular distance = 1.3:1.0. Face with a very well-developed protrusion; dorsal side of protrusion with a midlongitudinal carina. Facial ratio = 1.19:2.32:1.0. Frons with a row of long setae close to eye and with broad moderately setose zone laterally. Ocellar ratio = 1.1:1.0:4.0. Head index = 0.7. Mesosoma 2.5-3.4 times longer than deep. Pronotum weakly emarginate medioanteriorly; extensively densely setose posterodorsally. Scutellar sulcus crenulate. Radial sector ratio = 6.8:5.25:1.0. Submarginal cell ratio = 1.0:2.5:1.05. Hindwing vein ratio = 1.0:1.42. Fore leg ratio = 1.0:1.06:1.9. Fore basitarsal index = 6.3. Hind leg ratio = 1.4:2.3:1.0. Hind basitarsal index 4.9; hind basitarsus tapering gradually from base to apex. Metasoma largely with confused striate sculpture. First tergite about as long as wide; medial and lateral areas with some longitudinal striae. Second tergite approximately 3.3 times wider than medially long, with a raised, elongate, striate midlongitudinal area. Tergites 2-4 largely with confused longitudinal striations. Tergites 5-8 smooth. Ovipositor (exserted part) approximately 0.75 times length of forewing. Ochreous yellow to pale brownish orange (the head sometimes paler yellow) except for the following which are black or piceous: antennae, stemmaticum, hind telotarsi and ovipositor sheaths. Basal third of wings yellow, remainder dark grey-brown or brown except basal two thirds of pterostigma which are yellow and a small area below the pterostigma which is clear.

Notes. Widespread Indo-Australian species with just a few Australian specimens known.

Chaoilta (Chaoilta) nigriceps (Cameron)

Fig. 8a-c

Platybracon nigriceps Cameron, 1911a: 338.—Parrott, 1953: 209.

Chaoilta nigriceps.—Baltazar, 1972: 263.—Shenefelt, 1978: 1669.

Material examined. HOLOTYPE female labelled “*Platybracon nigriceps* Cam. Type. NSW.”, “B.M. Type Hym. 3.c.609”, “Gin Gin, W.W.F. 13.10.01.” and “P.

Cameron Coll. 1914-110" (BMNH; 3.c.609).

Northern Territory: 1 female, McArthur River, 48 km south-west by south of Borrooloola, Oct. 1975 (ANIC). Queensland: 1 female, Biggenden, May 1973 (ANIC); 1 female, Biggenden, Mar. 1981 (ANIC); 1 female, Brisbane, Sept. 1912 (QM); 1 female, Bluff Range, Apr. 1975 (ANIC); 1 female, Bundaberg, Aug.-Sept. 1971 (ANIC); 1 female, Coast Range, about 13 km south of Biggenden, Jan. 1910 (ANIC); 1 female, Cordalba State Forest, Oct. 1978 (ANIC); 1 female, Eidsvold, Dec. 1922 (AM); 1 female, Hastings Creek, Dec. 1976 (ANIC); 1 female, Hogback Range about 44 mi (= 71 km) west-south-west of Bundaberg, July 1972 (ANIC); 1 female, Iron Range, June 1971 (ANIC); 2 females, Kuranda, Nov. 1952 (AM); 4 females, Mackay, ? 1909 (BMNH); 1 female, Mount Glorius, Dec. 1965 (BMNH); 1 female, Nanango District, Nov. 1927 (QM); 1 female, Yeppoon, Oct. 1924 (AM).

Description. *Female.* Length of body 8-12 mm, of forewing 8.9-12.5 mm and of ovipositor (part exerted beyond apex of metasoma) 5.5-7.0 mm. Antennae with approximately 50 flagellomeres. First flagellomere 1.1 and 1.2 times longer than the second and third respectively, the latter being 1.35 times longer than wide. Inter-tentorial distance : tentorio-ocular distance = 1.3:1.0. Face with a well-developed transverse protrusion. Dorsal side of protrusion with a midlongitudinal carina. Facial ratio = 1.36:2.5:1.0. Frons with moderately long setae narrowly near eye, glabrous elsewhere. Ocellar ratio = 1.39-1.56:1.0:4.0-4.3. Head index = 0.82. Mesosoma 3.45-3.78 times longer than high. Pronotum very weakly concave medioanteriorly; moderately setose posterodorsally. Scutellar sulcus finely punctate. Scutellum usually more or less flat in profile. Propodeum usually with strigate to rugose sculpture medially or medioposteriorly. Radial sector ratio = 9.1:6.7:1.0. Submarginal cell ratio = 1.13:2.7:1.0. Hind wing vein ratio = 1.0:2.0. Fore leg ratio = 1.0:1.1:1.9. Fore basitarsal ratio = 8.0. Hind leg ratio = 1.44:2.31:1.0. Hind basitarsal ratio = 6.4. First metasomal tergite approximately 1.2 times wider posteriorly than long; lateral areas wide, largely smooth; median area finely longitudinally striate. Second tergite approximately 2.85 times wider than long, with large smooth anteriolateral areas, elsewhere largely longitudinally striate. Fourth tergite largely longitudinally striate. Fifth tergite with striate to striate-rugose sculpture at least anteriorly. Sixth and subsequent tergites smooth. Ovipositor approximately 0.6 times forewing length. Brownish orange except for the antennae, head, mid-telotarsus, hind tarsus and ovipositor sheaths which are black. Wings grey brown to brown except for the basal third which is dull yellow, and a small area below the pterostigma which is clear to hyaline. Pterostigma largely bright yellow.

Notes. Entirely Australian, this species is easily distinguished from related species occurring in Papua New Guinea by its entirely black head. Within Australia this species has been collected mainly in Queensland with just a single specimen each seen by the author from New South Wales and the Northern Territory.

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