

Four new genera of the subfamily Braconinae (Hymenoptera: Braconidae) from the Indo-Australian region

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Four new genera of Braconinae (Braconidae) are described and illustrated from the Indo-Australian region: *Acampyloneurus* gen. nov. (type species: *Campyloneurus aruensis* Shenefelt, 1978) from Aru, *Arubracon* gen. nov. (type species: *Bracon basalis* Smith, 1859) from Aru, *Floralibracon* gen. nov. (type species: *Bracon floralis* Smith, 1857) from Sarawak, and *Indabracon* gen. nov. (type species: *Spinaria trimaculata* Cameron, 1900) from India. Keys to the species of *Arubracon* gen. nov. and of *Indabracon* gen. nov. are added.

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Introduction

During the preparation of a catalogue of primary types of Braconidae in the collection of the Hope Department, University Museum, Oxford four undescribed genera were found; all belong to the subfamily Braconinae Nees, 1812, and are described below. The biology is unknown, but related genera are idiobiont ectoparasites of concealed larvae of holometabolous insects.

For identification of the subfamily Braconinae, see van Achterberg (1990); for a key to the genera of the subfamily Braconinae, see Quicke, (1987); for the terminology used in this paper, see van Achterberg (1988).

Descriptions

Floralibracon gen. nov.

Type species: *Bracon floralis* Smith, 1857.

Etymology.— Combination of the species name of the type species ("*floralis*", because of the floral ornamentation of the face, fig. 3), and the generic name "*Bracon*". Gender: masculine.

Diagnosis.— Head and mesosoma smooth dorsally; scapus rather robust (fig. 13), gradually narrowed basally, apically protruding ventrally (fig. 3), and its inner apical margin double (figs 12, 13); pedicellus subcylindrical (fig. 11); frons nearly flat, with narrow median groove (fig. 2); eyes glabrous and not emarginate (fig. 3); face with petal-shaped area, rugose-punctate dorso-laterally, sparsely punctate ventro-laterally (fig. 3); clypeus without dorsal carina, and its ventral margin thin and upcurved (fig. 3); malar suture absent, but with wide, shallow depression (fig. 3); labio-maxillary

complex not protruding (fig. 16); labrum concave; mesoscutum largely glabrous; notauli shallowly impressed, absent posteriorly (fig. 14); pleural sulcus deep and narrow; mesosternal sulcus smooth, obsolescent; antescutal depression absent; metapleural flange absent (fig. 16); scutellar sulcus narrow (fig. 14); metanotum without median carina, not protruding (figs 14, 16); propodeum mainly smooth, without median carina; propodeal spiracle elliptical, near middle of propodeum, and without tubercle above it (fig. 16); angle between veins 1-SR and C+SC+R of fore wing about 60° (fig. 8); vein 1-SR+M of fore wing evenly curved (fig. 1); vein cu-a of fore wing just postfurcal and vertical (fig. 1); vein 1-M of fore wing straight; vein CU1b of fore wing short, slender, reclivous (fig. 1); vein m-cu of fore wing converging to vein 1-M posteriorly (fig. 1); vein 1-R1 of fore wing much longer than pterostigma, ending at apex of wing, and distad of apex of vein 3-M (fig. 1); vein 1-SR of fore wing normal (fig. 8); vein 3-CU1 of fore wing slender; vein r of fore wing oblique and about as long as width of pterostigma (fig. 1); second submarginal cell of fore wing long, and subparallel-sided (fig. 1); vein 2-SC+R of hind wing quadrate (fig. 1); vein 1r-m of hind wing slightly longer than vein SC+R1 and straight; hind wing with 5 bristles on vein C+SC+R baso-anteriorly and with 3 hamuli on vein R1, membrane largely glabrous near vein cu-a (fig. 7); tarsal claws without lobe, setose (fig. 6); tarsal segments normal (fig. 4), with long black bristly setae; fore tibia with one spur, 0.6 times fore basitarsus; first metasomal tergite movably joined to second tergite, smooth, with deep, elongate pit medio-basally (fig. 5), in lateral view low basally (fig. 16), without median carina, its medial area distinctly elevated, flattened and with angulate sides, and lateral areas wide (fig. 5); dorsal carinae of first tergite absent; second tergite with rather large triangular and smooth medio-basal area, connected to median carina posteriorly (fig. 5), without V-shaped area medially, and with pair of wide diverging depressiona laterally, antero-lateral with converging grooves (fig. 5); second metasomal suture deep and crenulate, moderately wide (fig. 5); only third tergite with incomplete antero-lateral grooves (fig. 5); second and third tergites with lateral crease; apex of ovipositor aberrant (the narrow upper valve of the holotype is broken apically; according to a note made during an earlier visit to OUM, it is strongly depressed and truncate apically, much thinner than lower valve), lower valve without teeth, rather slender (figs 9, 10); ovipositor sheath very densely setose, with long and bristly setae, its length about 0.7 times length of fore wing; hypopygium rather large and apically acute (fig. 16), not emarginate medio-apically.

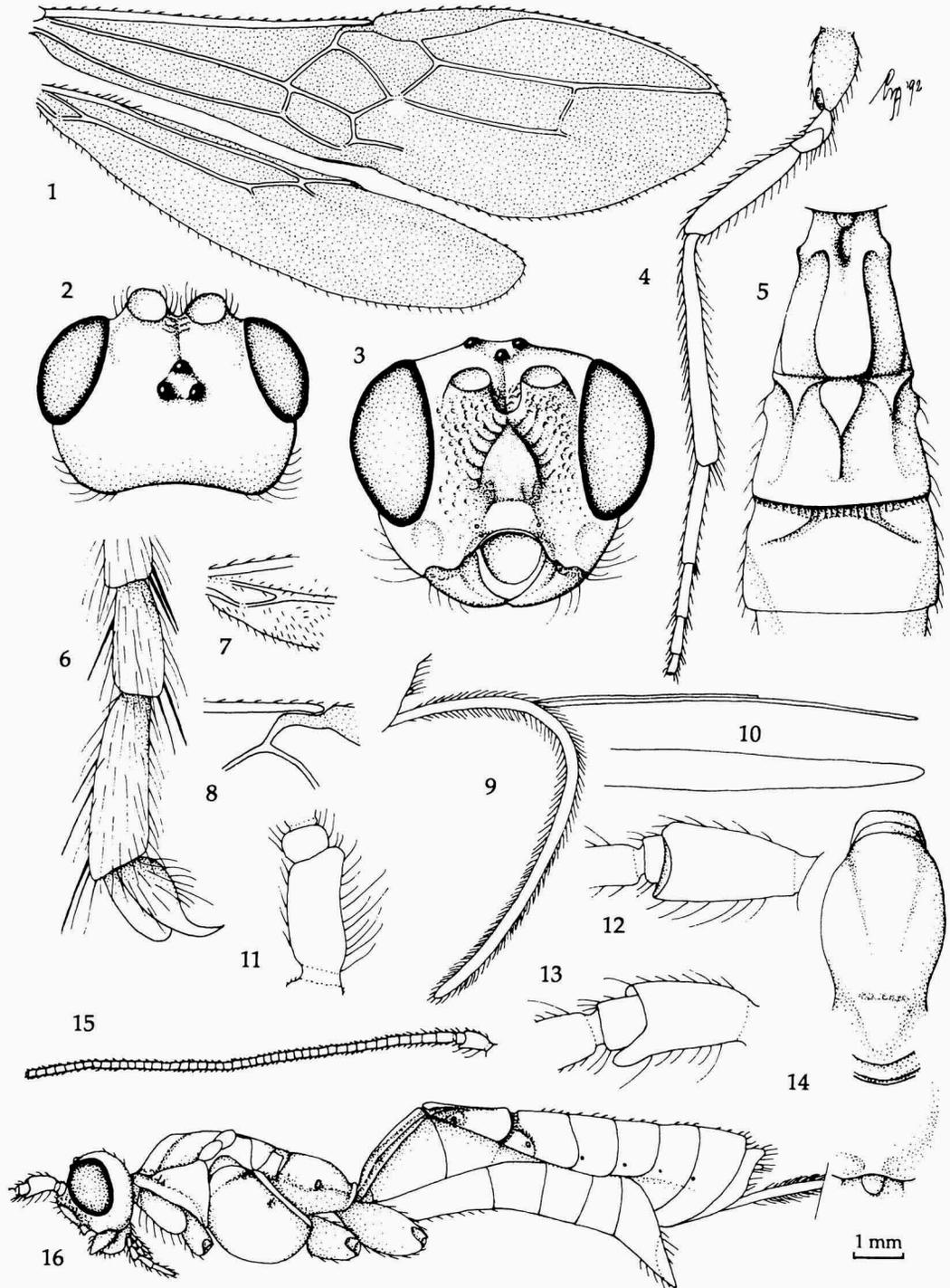
Distribution.— Oriental (Borneo): one species.

Note.— Related to the genera *Spathulibracon* Quicke, 1989 and *Nesaulax* Roman, 1914; the new genus differs by the petal-shaped area of face, the flattened upper valve of the ovipositor, the vertical vein cu-a of fore wing, the fourth metasomal tergite without antero-lateral grooves, and the wide lateral areas of the first tergite. *Floralibracon* will key out in the key by Quicke (1987) to couplet 97.

***Floralibracon floralis* (Smith, 1857) comb. nov.**
(figs 1-16)

Bracon floralis Smith, 1857: 125.

Iphiaulax floralis; Shenefelt, 1978: 1765.



Figs. 1-16, *Floralibracon* gen. nov. *floralis* (Smith), ♀, holotype. 1, wings; 2, head, dorsal aspect; 3, head, frontal aspect; 4, hind leg; 5, first-third metasomal tergites, dorsal aspect; 6, outer fore claw; 7, base of hind wing; 8, detail of vein 1-SR of fore wing; 9, lower valve of ovipositor and its sheath, lateral aspect; 10, detail of apex of ovipositor, lateral aspect; 11, scapus and pedicellus, dorsal aspect; 12, id., inner lateral aspect; 13, id., outer lateral aspect; 14, mesosoma, dorsal aspect; 15, antenna; 16, habitus, lateral aspect. 1, 4, 9, 15, 16: 1 × scale-line; 2, 3: 3 ×; 5, 14: 1.5 ×; 6, 10: 11 ×; 7, 8: 2 ×; 11-13: 5 ×.

Holotype, ♀, length of body 13.9 mm, and of fore wing 14.0 mm.

Head.— Antennal segments 47 (but apical segments missing), four basal segments with coarse, long, blackish setae, length of third segment 1.7 times fourth segment, length of third and fourth antennal segments 2.7 and 1.6 times their width, respectively (figs 15, 16); scapus distinctly compressed (figs 11, 13); length of maxillary palp 0.8 times height of head; length of eye 1.7 times temple in dorsal view (fig. 2); temple gradually narrowed posteriorly (fig. 2); OOL:diameter of ocellus:POL = 8:3:3; face distinctly sculptured, with petal-shaped, superficially granulate area (fig. 3); clypeus smooth; length of malar space 0.8 times basal width of mandible.

Mesosoma.— Length of mesosoma 1.7 times its height; episternal scrobe small, round; metapleuron sparsely punctate; surface of propodeum sparsely punctate and setose.

Wings.— Fore wing: r:3-SR:SR1 = 9:51:48; 1-SR short and not linear with 1-M (fig. 1); 1-CU1:2-CU1 = 1:12; 2-SR:3-SR:r-m = 18:51:16.

Legs.— Hind coxa sparsely punctate; length of femur, tibia and basitarsus of hind leg 5.0, 11.3, and 7.5 times their width, respectively; length of hind tibial spurs 0.3 and 0.4 times hind basitarsus.

Metasoma.— Length of first tergite 1.3 times its apical width, its surface smooth (fig. 5); second tergite and following tergites smooth; remainder of metasoma compressed; length of ovipositor sheath 0.71 times fore wing.

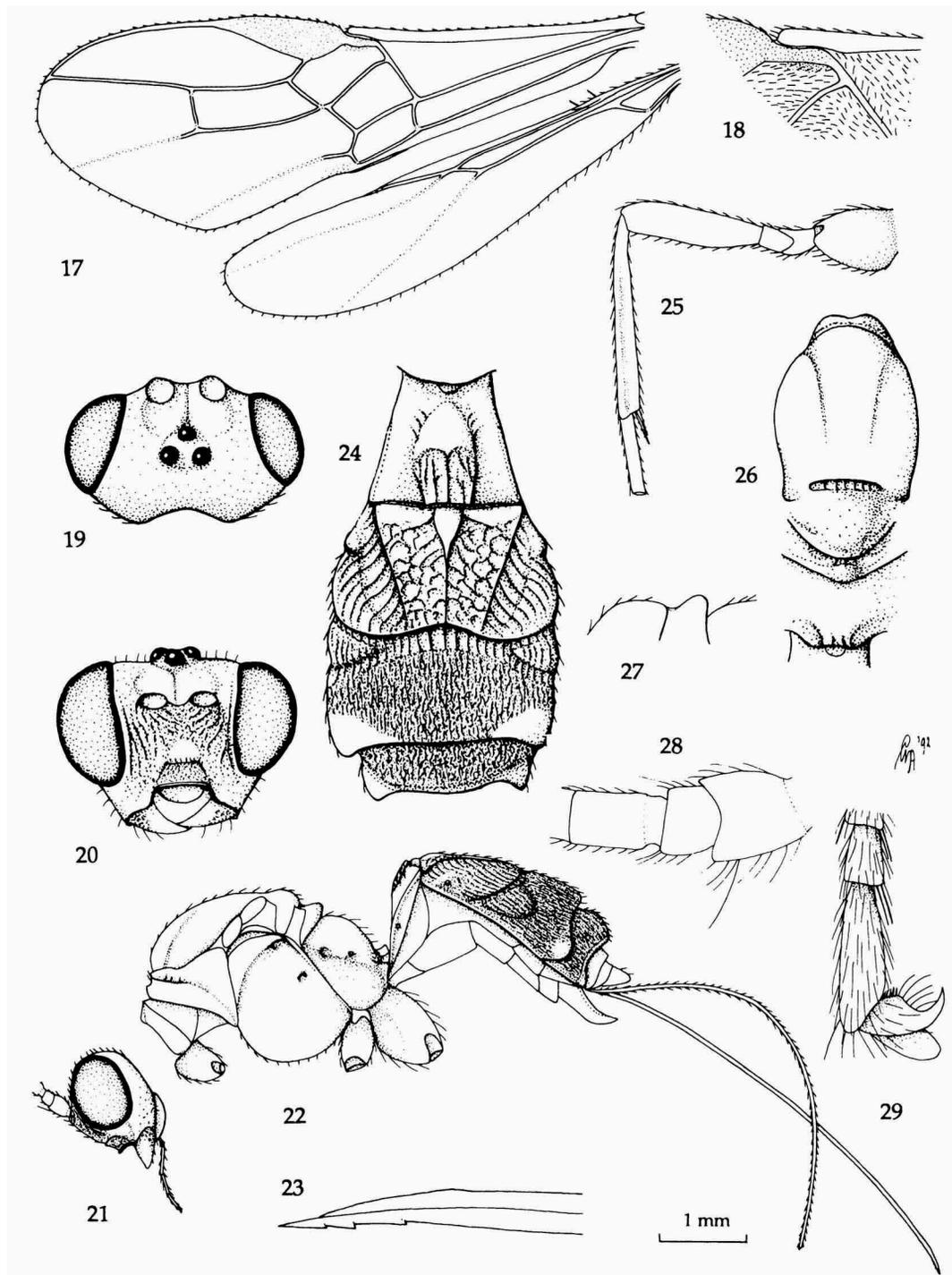
Colour.— Black; head, scapus (but outer side infuscated), pedicellus, head, (but stemmaticum black), mesosoma (but propodeum black, except reddish median stripe), fore leg (with trochanter and telotarsus infuscated) rather pale reddish-brown; middle trochantellus medially, base of its tibia brownish; inner side of apices of trochanters, ventral 0.6 of metasoma pale yellowish; wing membrane dark brown (except small pale patch below pterostigma, fig. 1); veins and pterostigma dark brown.

Indabracon gen. nov.

Type species: *Spinaria trimaculata* Cameron, 1900.

Etymology.— From "India" (country of origin of the type species) and the generic name "*Bracon*". Gender: masculine.

Diagnosis [because the head of the holotype of the type species is missing, the characters of the head are derived from *I. medievalvis* spec. nov.].— Head and mesosoma largely smooth dorsally (figs 19, 26); scapus globose (fig. 28), gradually narrowed basally, apically hardly protruding ventrally (fig. 28), and its inner apical margin simple (figs 21, 28); pedicellus subcylindrical (fig. 28); frons nearly flat, with narrow median groove (fig. 19); eyes glabrous and not emarginate (fig. 20); face with few rugae and rugulae (fig. 20); clypeus without dorsal carina, only elevated dorsally, and its ventral margin thin and rather upcurved (figs 20, 21); malar suture absent; head directly narrowed posteriorly (fig. 19); labio-maxillary complex not protruding (fig. 21); labrum concave; occipital flange large, reaching above lower level of eyes, thin (fig. 21); mesoscutum largely glabrous; notauli shallowly impressed, smooth, absent posteriorly (fig. 26); pleural sulcus absent medially, smooth; mesosternal sulcus smooth, shallow; antescutal depression and metapleural flange narrow (fig. 22),



Figs 17, 18, 22-27, 29, *Indabracon* gen. nov. *trimaculatus* (Cameron), ♀, holotype; figs 19-21, 28, *I. medivalvis* gen. nov. & spec. nov., ♀, holotype. 17, wings; 18, detail of vein 1-SR of fore wing; 19, head, dorsal aspect; 20, head, frontal aspect; 21, head, lateral aspect; 22, habitus, lateral aspect; 23, tip of ovipositor; 24, first-third metasomal tergites, dorsal aspect; 25, hind leg; 26, mesosoma, dorsal aspect; 27, metanotum, lateral aspect; 28, three basal segments of antenna, lateral aspect; 29, outer fore claw. 17, 21, 22, 25: 1 × scale-line; 18, 24, 26, 27: 1.4 ×; 19, 20: 1.7 ×; 23: 7 ×; 28, 29: 5 ×.

absent posteriorly (fig. 26); pleural sulcus absent medially, smooth; mesosternal sulcus smooth, shallow; antescutal depression and metapleural flange narrow (fig. 22), may be distinctly protruding anteriorly; scutellar sulcus medium-sized (fig. 26); metanotum with short median carina anteriorly, distinctly protruding posteriorly (figs 22, 26, 27); propodeum smooth, laterally long setose and remainder largely glabrous, without median carina, short carina may be present posteriorly; propodeal spiracle round, near middle of propodeum, and without tubercle above it (fig. 26); angle between veins 1-SR and C+SC+R of fore wing about 50° (fig. 18); vein 1-SR+M of fore wing slightly bent basally (fig. 17); vein cu-a of fore wing subinterstitial straight (may be slightly bent basally towards base of wing; fig. 17); vein 1-M of fore wing straight; vein CU1b of fore wing medium-sized to long (slightly shorter than 3-CU1), slender, reclivous (fig. 17); vein m-cu of fore wing converging to vein 1-M posteriorly (fig. 17); vein 1-R1 of fore wing much longer than pterostigma, ending distad of apex of vein 3-M (fig. 17); vein 1-SR of fore wing normal (fig. 17); vein 3-CU1 of fore wing slender; vein r of fore wing oblique and shorter than width of pterostigma (fig. 17); second submarginal cell of fore wing long, and subparallel-sided (fig. 17); vein 2-SC+R of hind wing horizontal (fig. 17); vein 1r-m of hind wing straight, much shorter than vein SC+R1 and straight (fig. 17); hind wing with 2 bristles baso-anteriorly and with 3 hamuli on vein R1, membrane largely glabrous near vein cu-a; tarsal claws without lobe, setose, but pectinate basally (fig. 29); tarsal segments normal; fore tibia with one spur, 0.6 times fore basitarsus; first metasomal tergite movably joined to second tergite, smooth laterally, shallowly concave medio-basally (fig. 24), in lateral view depressed basally (fig. 22), with median carina on medial area, its medial area distinctly elevated, rugose and with angulate sides, and lateral areas wide (fig. 22); dorsal carinae of first tergite absent basally; second tergite with small triangular and smooth medio-basal area, connected to median carina posteriorly, with V-shaped area medially, and with pair of wide converging depressions laterally (fig. 24); second metasomal suture deep and crenulate, moderately wide (fig. 24) or narrow medially; basal width of third tergite 2.3-2.6 times median length of tergite; third and fourth tergites densely and irregularly rugose, with complete antero-lateral grooves, and latero-posterior corner protruding, more or less smooth (fig. 24); second- fourth tergites with sharp lateral crease; fourth tergite distinctly convex (fig. 22) and with narrow transverse posterior groove (this groove is absent on third tergite); apex of ovipositor normal, lower valve with teeth (fig. 23); ovipositor sheath normally setose, its length about 0.7 times length of fore wing; hypopygium medium-sized and apically acute (fig. 22), not emarginate medio-apically.

Distribution.— Oriental (India, Borneo): two species.

Note.— Closely related to the Indo-Australian genus *Bicariniabracon* Quicke & Walker, 1991, because of the shape of the second metasomal tergite, the venation of the wings, and the wide occipital flange (but remaining far below lower level of eye). The new genus has two basal bristles on vein C+SC+R of hind wing (one bristle in *Bicariniabracon*), the pair of posterior propodeal carina at most short (at least half as long as propodeum in *Bicariniabracon*), the metanotum convex and protruding (hardly or not in *Bicariniabracon*), no deep malar suture (deep in *Bicariniabracon*), the scapus dorsally not longer than ventrally (as in *Bicariniabracon*), the long and thin occipital flange reaching lower level of eyes (thick and much shorter in *Bicariniabracon*). It shares with *Arubracon* gen. nov. the long and thin occipital flange and the globose

scapus, but differs e.g. by the shape of the second tergite (fig. 38) and smooth face. *Indabracon* will key out in the key by Quicke (1987) to couplet 108.

Key to species of the genus *Indabracon* nov.

1. Head, pronotum and part of mesoscutum pale brownish-yellow; ovipositor sheath about 0.7 times fore wing, much longer than metasoma (fig. 22); propodeum without distinct carinae posteriorly (fig. 26); middle tarsus dark brown; smooth postero-lateral area of third tergite large (fig. 24); second metasomal suture wide medially (fig. 24); metanotum distinctly protruding (fig. 27); (India) *I. trimaculatus* (Cameron)
- Head and complete mesosoma mainly orange-brown; ovipositor sheath 0.60-0.65 times fore wing, somewhat longer than metasoma; propodeum with two pair of short carinae posteriorly; middle tarsus (except telotarsus) yellowish-brown; smooth postero-lateral area of third tergite small; second metasomal suture narrow medially; metanotum moderately protruding; (Borneo) *I. medievalvis* spec. nov.

***Indabracon trimaculatus* (Cameron, 1900) comb. nov.**
(figs 17, 18, 22-27, 29)

Spinaria trimaculata Cameron, 1900; 81-83; Shenefelt, 1975: 1259 (generic position doubtful); Quicke & Walker, 1991: 420 (comparison with *Bicariniabracon*).

Material.— Holotype, ♀ (OUM), "*Spinaria trimaculata* Cam., Type, Khasia [N India]" (in Cameron's handwriting), "Type Hym.: 95, *Spinaria trimaculata* Cameron, Hope Dept. Oxford".

Holotype, ♀, length of body 6.3 mm (without head, according to original description 7 mm), and of fore wing 7.0 mm.

Head.— Missing; according to original description frons and vertex smooth; vertex with long (brownish) setae, face rugose, dorsal carina of clypeus present [probably mistaken for the dorsal elevation of the clypeus], ventrally clypeus upcurved, carina-like.

Mesosoma.— Length of mesosoma 1.4 times its height; episternal scrobe rather small, round; metapleuron punctulate; surface of propodeum smooth.

Wings.— Fore wing: r:3-SR:SR1 = 5:25:36; 1-SR short and linear with 1-M (fig. 17); 2-SR:3-SR:r-m = 10:25:10.

Legs.— Hind coxa smooth; length of femur, tibia and basitarsus of hind leg 4.1, 8.7, and 6 times their width, respectively; length of hind tibial spurs 0.3 and 0.4 times hind basitarsus.

Metasoma.— Length of first tergite 0.8 times its apical width, its surface smooth laterally and basally, medial area sparsely rugose (fig. 24); second and third tergites largely densely and irregularly longitudinally rugose (fig. 24); remainder of metasoma largely retracted and smooth; length of ovipositor sheath 0.73 times fore wing.

Colour.— Black; (head according to original description pale yellowish), prothorax, notaulic area, lateral mesoscutal lobes anteriorly, tegulae, mesopleuron antero-

dorsally, fore leg (but telotarsus infuscated), middle femur and tibia, fifth and following tergites, metasoma ventrally largely and first tergite (except medio-posterior area) pale brownish-yellow; wing membrane slightly infuscated; pterostigma and veins dark brown.

***Indabracon medivalvis* spec. nov.**

(figs 19-21, 28)

Material.— Holotype, ♀ (RMNH), "Malaysia- SE Sabah, nr Danum Valley Field Centre, W12, c 240 m, Mal. trap 12b, 19-26.iii.1987, C. v. Achterberg, RMNH". Paratypes (3 ♀♀, RMNH, FRS): topotypic, "WON1, Mal. trap 13, 24.ii-24.iii.1987".

Holotype, ♀, length of body 6.7 mm, and of fore wing 6.0 mm.

Head.— Antennal segments 52, length of third segment 1.4 times fourth segment, length of third, fourth and penultimate segments 1.5, 1.1, and 1.4 times their width, respectively (fig. 28); apex of antenna with short spine; length of maxillary palp 0.8 times height of head; vertex punctulate and with dark brown setae; frons punctulate laterally, smooth medially; length of eye 2.2 times temple in dorsal view (fig. 19); OOL:diameter of ocellus:POL = 7:3:3; face distinctly rugose (fig. 20); clypeus microsculptured; temple punctate laterally; length of malar space 0.8 times basal width of mandible; mandible coarsely punctate.

Mesosoma.— Length of mesosoma 1.3 times its height; side of pronotum largely smooth, anteriorly with some crenulae, postero-dorsally sparsely and finely punctate; metapleuron densely punctulate, its flange comparatively large and distinctly protruding anteriorly; scutellum distinctly convex, sparsely punctate; metanotum convex, but far less protruding than figured for *I. trimaculatus* (fig. 22); surface of propodeum smooth, posteriorly with four short carinae, dorsally glabrous, laterally with long setae.

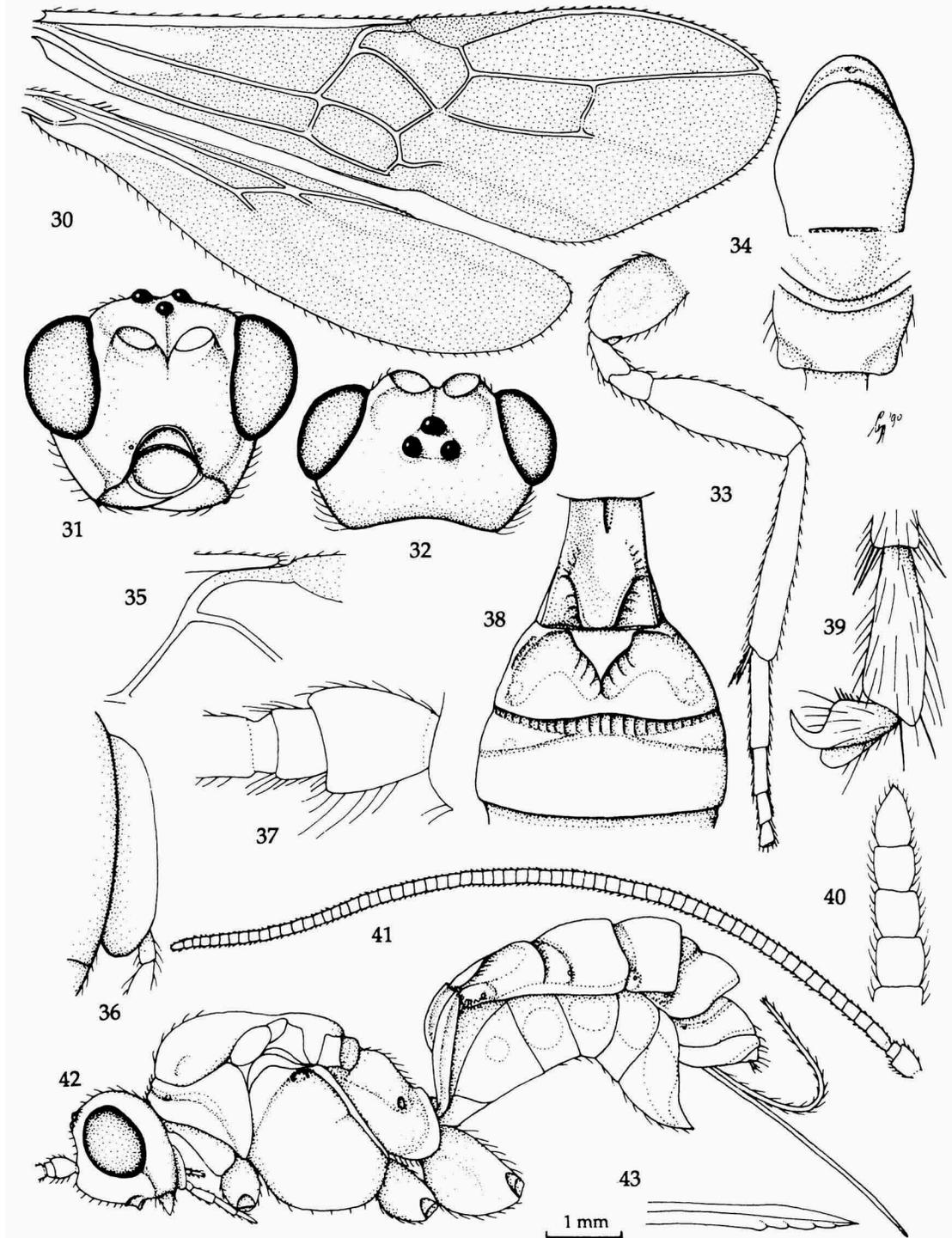
Wings.— Fore wing (cf. fig. 17): r:3-SR:SR1 = 5:28:37; length of CU1b 0.8 times 3-CU1; 2-SR:3-SR:r-m = 11:28:11. Hind wing: 1r-m somewhat longer than figured for *I. trimaculatus*.

Legs.— Hind coxa punctulate; femur and tibia distinctly compressed; length of femur, tibia and basitarsus of hind leg 3.7, 8.0, and 5 times their width, respectively; length of hind tibial spurs 0.45 and 0.55 times hind basitarsus; length of fore spur 0.6 times fore basitarsus; fore tibia densely bristly setose anteriorly.

Metasoma.— Length of first tergite 0.8 times its apical width, its medial area more carinate laterally than figured for *I. trimaculatus* (fig. 24), further very similar; second suture narrow medially; basal width of third tergite 2.3 times its median length; length of ovipositor sheath 0.60 times fore wing, somewhat (1.1 times) longer than metasoma.

Colour.— Orange-brown; malar space, mesoscutum medio-posteriorly, pronotal side ventrally, tegulae, mesopleuron dorsally, palpi, first tergite (except medial area), second tergite anteriorly, yellowish; antenna, stemmaticum, hind leg (but coxa partly reddish basally), second tergite laterally, third-fifth tergites blackish; fore and middle telotarsi, pterostigma and veins (except near base of wing) dark brown; metasoma (except some dark brown sclerotized patches) ventrally, posterior margin of fifth tergite, and most of following tergites whitish; wing membrane rather infuscated.

Variation.— Length of body 4.9-6.7 mm, of fore wing 5.0-6.1 mm; antennal seg-



Figs 30-43, *Arubracon* gen. nov. *basalis* (Smith), ♀, holotype. 30, wings; 31, head, frontal aspect; 32, head, dorsal aspect; 33, hind leg; 34, mesosoma, dorsal aspect; 35, detail of vein 1-SR of fore wing; 36, detail of occipital flange, lateral aspect; 37, scapus and pedicellus, outer lateral aspect; 38, first-third metasomal tergites, dorsal aspect; 39, inner middle claw; 40, apex of antenna; 41, antenna; 42, habitus, lateral aspect; 43, apex of ovipositor, lateral aspect. 30, 33, 41, 42: 1 × scale-line; 31, 32, 35: 2 ×; 34, 38: 1.2 ×; 36, 37, 43: 4.5 ×; 39, 40: 5 ×.

ments of ♀ 48(1), 52(1), or 53(1); length of ovipositor sheath 0.60-0.66 times fore wing; hind coxa may be largely reddish.

Arubracon gen. nov.

Type species: *Bracon basalis* Smith, 1859.

Etymology.— From "Aru", the type locality of the type species, and the generic name "*Bracon*". Gender: masculine.

Diagnosis.— Head and mesosoma smooth dorsally; scapus globose (fig. 37), gradually narrowed basally, apically truncate, ventrally somewhat shorter than dorsally, and its inner apical margin simple (figs 37, 42); pedicellus subcylindrical (fig. 37); frons nearly flat, with shallow median groove (fig. 32); eyes glabrous and not emarginate (fig. 31); face smooth; clypeus smooth, with strong dorsal carina, and its ventral margin thin and upcurved (fig. 31); malar suture present, shallow (fig. 31); occipital flange large, thin, rather concave, and reaching above lower level of eyes (figs 36, 42); labio-maxillary complex not protruding (fig. 16); labrum concave; mesoscutum largely glabrous; notauli absent, except for indistinct basal trace (figs 34, 42); pleural sulcus smooth; mesosternal sulcus smooth, shallow; antescutal depression absent; metapleural flange absent, but rim widened posteriorly (fig. 42); scutellar sulcus narrow (fig. 34); metanotum without median carina, not protruding (figs 34, 42); propodeum mainly smooth, only laterally and anteriorly with long setae, without median carina; propodeal spiracle round, behind middle of propodeum, and without tubercle above it (fig. 42); angle between veins 1-SR and C+SC+R of fore wing about 40° (fig. 35); vein 1-SR+M of fore wing bent basally (figs 30, 35); vein cu-a of fore wing just postfurcal straight, and vertical (fig. 30); vein 1-M of fore wing straight; vein CU1b of fore wing medium-sized, slender, reclivous (fig. 30); vein m-cu of fore wing converging to vein 1-M posteriorly (fig. 1); vein 1-SR of fore wing curved and somewhat widened (fig. 35); vein 1-R1 of fore wing much longer than pterostigma, ending distad of apex of vein 3-M (fig. 30); vein 1-CU1 of fore wing widened; vein r of fore wing oblique and about as long as width of pterostigma (fig. 30); second submarginal cell of fore wing long, and subparallel-sided; vein 2-SC+R of hind wing subquadrate (fig. 30); vein 1r-m of hind wing much shorter than vein SC+R1 and straight; hind wing with 3 bristles baso-anteriorly and with 3 hamuli on vein R1, membrane largely glabrous near vein cu-a; tarsal claws without lobe, short pectinate basally (fig. 39); tarsal segments normal (fig. 33); fore tibia with one spur, 0.7 times fore basitarsus; first metasomal tergite movably joined to second tergite, largely smooth, with deep, elongate pit medio-basally (fig. 38), in lateral view low basally (fig. 42), without median carina, its medial area distinctly elevated, flattened and with angulate sides, and lateral areas wide posteriorly (fig. 38); dorsal carinae of first tergite absent anteriorly; second tergite with wide triangular and smooth medio-basal area, connected to short median carina posteriorly (fig. 38), without V-shaped area medially, and with pair of wide diverging depressions laterally (fig. 38); second metasomal suture deep and crenulate, wide medially (fig. 38); second-fourth tergites with antero-lateral grooves (fig. 42); second-sixth tergites with sharp lateral crease, because epipleura are weakly sclerotized (fig. 42); basal width of third tergite about 2.8 times its median length (fig. 38); fourth-sixth tergites with subbasal transverse

grooves (fig. 42); sixth tergite exposed (fig. 42); apex of ovipositor normal, with minute nodus, no notch, and lower valve with small teeth (fig. 43); ovipositor sheath normally setose, its length about 0.7 times length of fore wing; hypopygium rather large, partly sclerotized only, and apically acute (fig. 42), not emarginate medio-apically; second-fifth sternites with pigmented sclerotized patches, remainder hardly sclerotized.

Distribution.— Papuan: three species.

Note.— Resembles the genus *Campyloneurus* Szépligeti, 1900, but the new genus has the occipital flange enlarged (fig. 36), vein 1-SR of fore wing widened (fig. 35), the medio-basal area of second tergite robust (fig. 38), the sixth tergite distinctly exposed, the notauli largely absent and the third tergite with long antero-lateral grooves (fig. 38). *Arubracon* will key out in the key by Quicke (1987) to couplet 106 (with difficulty).

Key to species of the genus *Arubracon* nov.

1. Face largely punctate; basal half of membrane of fore wing subhyaline; vein 1r-m of hind wing angularly bent subposteriorly; first tergite, hind tibia and tarsus largely brownish-yellow; length of fore wing about 8 mm; (Aru) *A. nitidus* (Smith)
- Face smooth; at most basal quarter of membrane of fore wing subhyaline (fig. 30); vein 1r-m of hind wing straight; first tergite black, if yellowish then hind tibia and tarsus dark brown; length of fore wing about 10 mm 2
2. First and second metasomal tergites completely black; medial area of first tergite and medio-basal area of second tergite moderately elevated posteriorly; wing membrane completely dark brown; parastigma largely dark brown; hind tibia and tarsus brownish-yellow; palpi dark brown basally; (New Guinea) *A. tricolor* (Guérin-Méneville) sensu Smith
- First metasomal tergite and second tergite antero-medially brownish-yellow; medial area of first tergite and medio-basal area of second tergite strongly elevated posteriorly (fig. 42); basal quarter of fore wing membrane yellowish (fig. 30); parastigma yellowish distally; hind tibia and tarsus dark brown; palpi brownish-yellow basally; (Aru) *A. basalis* (Smith)

Arubracon basalis (Smith, 1859) comb. nov. (figs 30-43)

Bracon basalis Smith, 1859: 174; Shenefelt, 1978: 1468.

Material.— Holotype, ♀ (OUM), "Aru", "*Bracon basalis* Smith".

Holotype, ♀, length of body 9.5 mm, and of fore wing 10.0 mm.

Head.— Antennal segments 66, length of third segment 1.5 times fourth segment, length of third, fourth, and penultimate antennal segments 2.1, 1.4, and 1.0 times their width, respectively (figs 37, 40, 41); length of maxillary palp 0.7 times height of head; length of eye twice temple in dorsal view (fig. 32); temple rather directly nar-

rowed posteriorly (fig. 32); OOL:diameter of ocellus:POL = 9:4:3; face and clypeus smooth; length of malar space equal to basal width of mandible.

Mesosoma.— Length of mesosoma 1.5 times its height; episternal scrobe linear, shallow; metapleuron smooth, densely setose; surface of propodeum smooth, laterally and anteriorly with long setae, remainder glabrous.

Wings.— Fore wing: r:3-SR:SR1 = 5:22:32; 1-SR curved and not linear with 1-M (fig. 35); 1-CU1:2-CU1 = 1:15; 2-SR:3-SR:r-m = 9:22:9.

Legs.— Hind coxa superficially punctulate; length of femur, tibia and basitarsus of hind leg 3.0, 7.8, and 5.3 times their width, respectively; length of hind tibial spurs 0.1 and 0.15 times hind basitarsus.

Metasoma.— Length of first tergite equal to its apical width, its surface largely smooth, with some weak crenulae (fig. 38); second tergite and following tergites smooth; remainder of metasoma depressed; length of ovipositor sheath 0.66 times fore wing.

Colour.— Brownish-yellow; antenna (but annellus, pedicellus ventrally, scapus apically yellowish), sclerotized patches of sternites, second and following nota of the metasomal tergites (but medio-basal area of second tergite and its surroundings yellow), and ovipositor sheath blackish or dark brown; rim of third-sixth tergites slightly pale; hind tibia and tarsus, wing veins (except near base of wings), parastigma (but distally yellowish) and pterostigma dark brown; wing membrane brown, but basally yellowish and with pale patches below pterostigma (fig. 30).

Arubracon nitidus (Smith, 1859) comb. nov.

Bracon nitidus Smith, 1859: 175; Shenefelt, 1978: 1518. Type in OUM.

Only known from Aru .

Arubracon tricolor (Guérin-Méneville, 1830) comb. nov.

Bracon tricolor Guérin-Méneville, 1830: 199; Smith, 1861: 141; Shenefelt, 1978: 1547. Type lost?

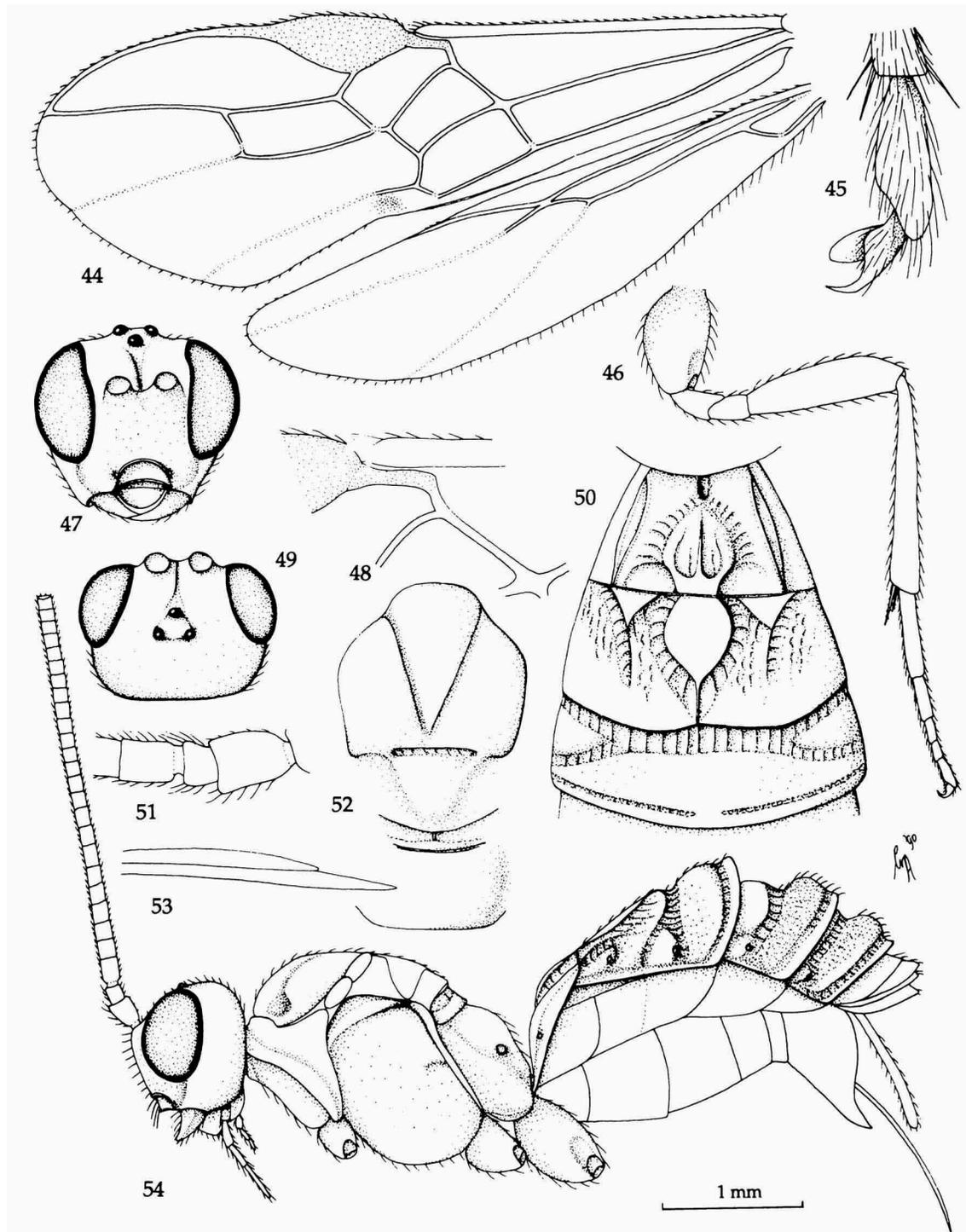
Only known from Dory, New Guinea.

Acampyloneurus gen. nov.

Type species: *Campyloneurus aruensis* Shenefelt, 1978 (= *Bracon abdominalis* Smith, 1859, nec Zetterstedt, 1840).

Etymology.— From "a" (Greek for "not") and the generic name *Campyloneurus*, because it is similar to *Campyloneurus*, but not closely related. Gender: masculine.

Diagnosis.— Head and mesosoma smooth dorsally; scapus rather robust (fig. 51), gradually narrowed basally, apically subtruncate, not protruding ventrally (fig. 51), and its inner apical margin single; pedicellus subcylindrical (fig. 51); frons flat, with median groove (fig. 49); eyes glabrous and slightly emarginate (fig. 47); face punctulate (fig. 47); clypeus with dorsal carina, and its ventral margin thin, cariniform,

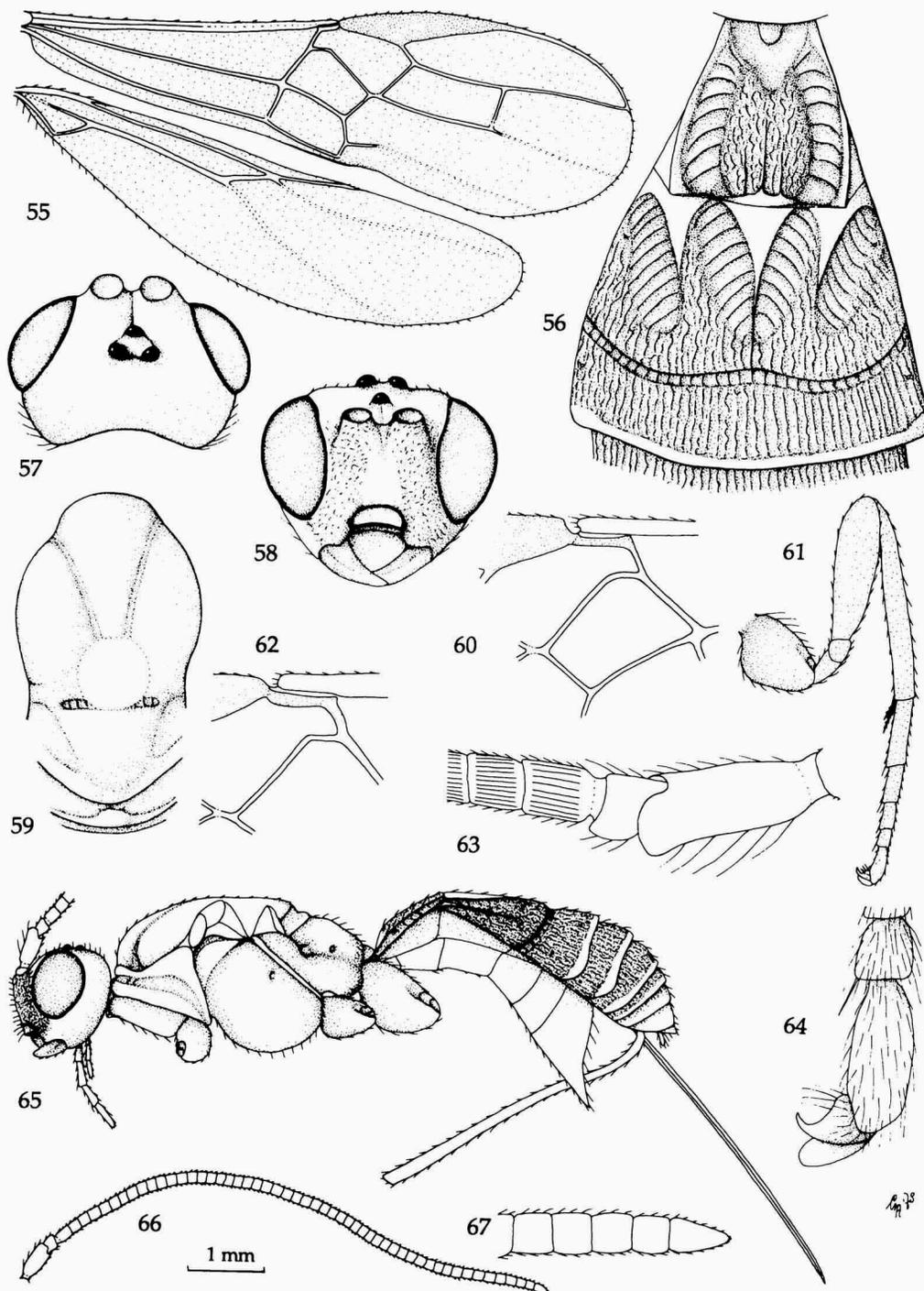


Figs 44-54, *Acampyloneurus* gen. nov. *aruensis* (Shenefelt), ♀, holotype. 44, wings; 45, inner hind claw; 46, hind leg; 47, head, frontal aspect; 48, detail of vein 1-SR of fore wing; 49, head, dorsal aspect; 50, first-third metasomal tergites, dorsal aspect; 51, scapus and pedicellus, outer lateral aspect; 52, mesosoma, dorsal aspect; 53, apex of ovipositor; 54, habitus, lateral aspect. 44, 46, 54: 1 × scale-line; 45, 51: 2.5 ×; 47, 49, 50, 52: 1.2 ×; 48: 2 ×; 53: 5.5 ×.

hardly protruding (fig. 47); occipital flange small, not reaching lower level of eyes; malar suture shallow (figs 47, 54); labio-maxillary complex short (fig. 54); labrum concave; mesoscutum rather sparsely setose; notauli complete, smooth, narrow (fig. 52); pleural sulcus smooth, obsolescent; mesosternal sulcus narrow, smooth; antescutal depression absent; metapleural flange narrow, cariniform (fig. 54); scutellar sulcus narrow (fig. 52); metanotum with short median carina, somewhat protruding (figs 52, 54); propodeum smooth; propodeal spiracle round, behind middle of propodeum, and without tubercle above it (fig. 54); angle between veins 1-SR and C+SC+R of fore wing about 75° (fig. 48); vein 1-SR+M of fore wing straight, except for weak basal bend (fig. 44); vein cu-a of fore wing slightly antefurcal, long, reclinous (fig. 44); vein 1-M of fore wing straight, not linear with 1-SR (fig. 44); vein CU1b of fore wing slender, medium-sized, strongly reclinous (fig. 44); vein m-cu of fore wing parallel with vein 1-M (fig. 44); vein 1-R1 of fore wing much longer than pterostigma, ending distad of apex of vein 3-M (fig. 44); vein 3-CU1 of fore wing slender; vein r of fore wing oblique and much shorter than width of pterostigma (fig. 44); second submarginal cell of fore wing rather long, and subparallel-sided (fig. 44); vein 2-SC+R of hind wing short, horizontal (fig. 44); vein 1r-m of hind wing much shorter than vein SC+R1 and slightly curved; hind wing with 1 bristle baso-anteriorly and with 3 hamuli on vein R1, membrane setose near vein cu-a; tarsal claws without lobe, setose (fig. 45); tarsal segments normal (fig. 46); fore tibia with one spur, 0.56 times fore basitarsus; fore tibia only bristly setose; first metasomal tergite movably joined to second tergite, smooth posteriorly, with deep, elongate depression medio-basally (fig. 50), in lateral view depressed basally (fig. 54), with median carina on medial area (fig. 50), its medial area distinctly elevated, flattened and with angulate sides postero-laterally, and lateral areas wide, partly crenulate (fig. 50); dorsal carinae of first tergite absent; second tergite with large cordiform and smooth medio-basal area, connected to median carina posteriorly (fig. 50), without V-shaped area medially, with pair of smooth triangular areas antero-laterally and with pair of wide, slightly converging depressions laterally (fig. 50); second metasomal suture deep, wide and crenulate (fig. 50); basal width of third tergite about 3.5 times median length of tergite; third tergite with antero-lateral grooves and with fine (incomplete) subapical transverse groove (fig. 50); second-fifth tergites with sharp lateral crease; fourth and fifth tergites strongly convex, with subapical transverse grooves and with antero-lateral grooves (fig. 54); apex of ovipositor very slender, without notch and distinct teeth, upper and lower valve of normal size (fig. 53); ovipositor slightly curved (fig. 54); ovipositor sheath moderately setose, its length about 0.2 times length of fore wing; hypopygium large and apically acute (fig. 54), not emarginate medio-apically.

Distribution.— Papuan: one species.

Note.— Related to the genus *Campyloneurus* Szépligeti, 1900, but the new genus differs as follows: the scapus is truncate apically (protruding apico-ventrally in *Campyloneurus*), the face is largely smooth (more or less sculptured in *Campyloneurus*), the antero-lateral grooves of third tergite deep (nearly absent or obsolescent in *Campyloneurus*), the sixth tergite largely retracted, without transverse groove and fourth tergite strongly convex medially (sixth tergite exposed and frequently with transverse groove, if sixth tergite is largely retracted then fourth tergite is flat in lateral view in *Campyloneurus*), the lower valve of ovipositor without distinct teeth (distinct in *Campyloneurus*). *Acampyloneurus* will key out in the key by Quicke (1987) to couplet 94.



Figs 55-67, *Campyloneurus bicolor* Szépligeti, ♀, New Guinea, Fenichel, but 60 from ♀, New Guinea, Huron Golf. 55, wings; 56, first-third metasomal tergites, dorsal aspect; 57, head, dorsal aspect; 58, head, frontal aspect; 59, mesonotum, dorsal aspect; 60, 62, detail of vein 1-SR+M of fore wing; 61, hind leg; 63, four basal segments of antenna, outer aspect; 64, outer middle claw; 65, habitus, lateral aspect; 66, antenna; 67, apex of antenna. 55, 61, 65, 66: 1 × scale-line; 56-60, 62,: 2 ×; 63, 64, 67: 10 ×.

***Acampyloneurus aruensis* (Shenefelt, 1978) comb. nov.**
(figs 44-54)

Bracon abdominalis Smith, 1859: 175 (nec Zetterstedt, 1840).

Campyloneurus aruensis Shenefelt, 1978: 1656 (replacement name).

Material.— Holotype, ♀ (OUM), "Aru", "*Bracon abdominalis* Smith".

Holotype, ♀, length of body 5.7 mm, and of fore wing 5.3 mm.

Head.— Antennae incomplete, one with 26 segments remaining, length of third segment 1.3 times fourth segment, length of third and fourth antennal segments 1.8 and 1.4 times their width, respectively (figs 51, 54); length of maxillary palp 0.7 times height of head; length of eye 1.8 times temple in dorsal view (fig. 49); temple gradually narrowed posteriorly (fig. 49); OOL:diameter of ocellus:POL = 5:2:4; face punctulate, with erect setae (fig. 47); clypeus smooth; length of malar space 1.4 times basal width of mandible; occipital flange small.

Mesosoma.— Length of mesosoma 1.4 times its height; episternal scrobe shallow, wide; metapleuron finely punctate; surface of propodeum smooth.

Wings.— Fore wing: r:3-SR:SR1 = 4:21:33; 1-SR short and not in line with 1-M (figs 44, 48); cu-a slightly antefurcal, reclivous (fig. 44); 2-SR:3-SR:r-m = 9:21:9.

Legs.— Hind coxa smooth, with long setae; length of femur, tibia and basitarsus of hind leg 3.4, 7.5, and 4.4 times their width, respectively; length of hind tibial spurs 0.3 and 0.4 times hind basitarsus; fore tibia only sparsely setose.

Metasoma.— Length of first tergite 0.7 times its apical width, its surface largely smooth, except for crenulation around medial area and some sculpture medially (fig. 50); second tergite with crenulation around cordiform medial area and in sublateral grooves, remaining part largely smooth (fig. 50); third tergite largely smooth; fourth and fifth tergites with superficial microsculpture (fig. 54); remainder of metasoma smooth, depressed; length of ovipositor sheath 0.19 times fore wing.

Colour.— Yellowish-brown (including stemmaticum); palpi pale yellowish; middle and hind telotarsi largely infuscated; ovipositor sheath and antenna (but scapus and pedicellus brown) blackish; pterostigma and most veins dark brown; wing membrane light brownish, with pair of pale patches below base of pterostigma.

Acknowledgements and abbreviations

I wish to thank Mr. C. O'Toole (Oxford) for the opportunity to study the types of Braconidae in OUM, and Dr D.L.J. Quicke (Sheffield) for his remarks on the first draft. FRS= Forest Research Centre, Sandakan; RMMH= Nationaal Natuurhistorisch Museum, Leiden; OUM= Oxford University Museum, Hope Department, Oxford.

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