# FURTHER STUDIES ON ASIRACINAE (HOMOPTERA: DELPHACIDAE) IN AUSTRALIA AND NEW CALEDONIA

#### J. F. Donaldson

Department of Primary Industries, Meiers Road, Indooroopilly, Qld 4068.

Kiambrama hylonoma gen. n., sp. n., K. longirostrata sp. n. and Notuchus oresbios sp. n. from North Queensland and Notuchoides montanus gen. n., sp. n. from New Caledonia are described. Notuchus palmerstonensis Donaldson is synonymised with N. kurandae Donaldson. A key to genera of Asiracinae in Australia and New Caledonia, keys to species of Kiambrama and Notuchus and new locality records for Notuchus are given.

# Introduction

Five species of Notuchus Fennah have been described from Australia (Donaldson 1979, 1987; Fennah 1973) and 2 from New Caledonia (Fennah 1969, 1980). Four of the species from Australia were based on single specimens, but additional material from North Queensland is now available. It contains specimens of a new species described below as N. oresbios and shows that N. palmerstonensis Donaldson is a synonym of N. kurandae Donaldson. The material also includes specimens of 2 new species representing a new genus *Kiambrama*, and these are described below as *K. hylonoma* (type species) and *K. longirostrata*. A monotypic new genus was also represented among specimens from New Caledonia now available and is described below as Notuchoides montanus gen. n., sp. n. Keys are presented to genera of Asiracinae in Australia and New Caledonia and to species of Notuchus and Kiambrama. The only other asiracine genus common to Australia and New Caledonia in Ugyops Guérin-Ménéville with 6 species in Australia (Donaldson 1983). However, 5 undescribed species are now also known (Donaldson, unpubl. data).

Abbreviations: ANIC, Australian National Insect Collection, CSIRO, Canberra; QDPI, Queensland Department of Primary Industries, Brisbane; QM, Queensland Museum, Brisbane.

Key to genera of Asiracinae in Australia and New Caledonia

1.	Mesonotum with 3 carinae (Figs 1, 9) 2		
	Mesonotum with 5 carinae (Figs 17, 26) 3		
2.	Frons with sublateral carinae (Fig. 3) Notuchus Fennah		
	Frons without sublateral carinae (Fig. 11) Notuchoides gen. n.		
3.	Antennae long, segment 1 at least 3 times as long as wide; frons		
	elongate Ugyops Guérin-Méneville		
	Antennae shorter, segment 1 ca twice as long as wide; frons not		
	elongate Kiambrama gen. n.		
Notuchus Fennah (Figs 1-8)			

Notuchus Fennah, 1969:32; Donaldson, 1979:181. Type species Notuchus risioides Fennah, 1969:32-33.

#### **Key to species of** *Notuchus*

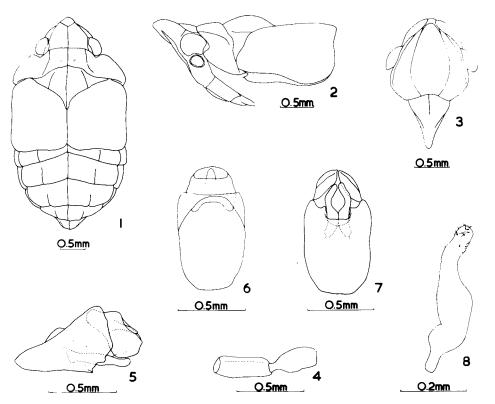
1.	Eyes reduced, non-functional; vertex short, length less than half width at base (New Caledonia) larvalis F	7amm=1
	_ width at base (New Caledonia) iarvans r	ennan
_	Eyes normal; vertex longer, more than half width at base	. 2
2.	Vertex with ratio of total length in midline to length anterior to	
	eyes < 1.8, in lateral view extending anterior to eyes	
	usually for more than length of an eye	. 3
	Vertex with ratio of total length in midline to length anterior to	
	eyes > 2.0, in lateral view extending anterior to eyes	
	usually for much less than length of an eye	. 5
3.	Vertex extending anterior to eyes for ca twice length of an eye,	
	marginal carinae not visible in dorsal view (Lord Howe I.)	

.. monticola Fennah

Vertex extending anterior to eyes for much less than twice length of an eye, marginal carinae visible in dorsal view at least near eyes Vertex acutely rounded, in lateral view extending anterior to eyes for more than length of an eye; anterolateral carinae strongly convex in lateral view; mesonotum with median carina strongly convex in lateral view (Queensland) oresbios sp. n. Vertex rounded, in lateral view extending anterior to eyes for ca length of an eye; anterolateral carinae nearly straight in lateral view; mesonotum with median carina only slightly convex in lateral view (Lord Howe I.) howensis Donaldson Frons with lateral margins angulate below level of eyes (New Caledonia) . risioides Fennah Frons with lateral margins evenly curved below level of eyes (Oueensland) Frons generally convex, lateral areas not depressed below level of median area; length of median area in midline usually < 1.6 times greatest width rotundifacies Donaldson Frons concave, lateral areas distinctly depressed below level of median area; length of median area in midline usually > 1.6 times greatest width kurandae Donaldson

# Notuchus oresbios sp. n. (Figs 1-8)

Types—Queensland: holotype &, labelled "Bellenden Ker Range, NQ, Summit TV Stn, 29 Apr-2 May 1983, G. B. Monteith, D. K. Yeates", "QM Berlesate No. 568, 17.16S 145.51E Rainforest, 1560 m, sieved litter" in QM (T.10912); paratypes: 1 \, Mt Bellenden Ker, Centre Peak, 10.iv.1979, G. B. Monteith, 1500 m;



Figs 1-8—Notuchus oresbios: (1) body, dorsal view; (2) head, pronotum, mesonotum and tegmen, lateral view; (3) frons and clypeus; (4) antenna; (5-8) & genitalia: (5) lateral view; (6) dorsal view; (7) ventral view; (8) left style.

Colour—Mostly uniformly light to very dark brown with dorsal carinae and longitudinal veins of tegmen smooth and shining. Abdominal tergites mottled in some light specimens. Lateral areas of head, antennae, rostrum, apical half of coxae, legs, pygofer and ovipositor often paler.

Head—Vertex elevated and acutely rounded apically, extending anterior to eyes 0.9-1.4 times length of an eye, total length in midline 1.3-1.6 times length anterior to eyes and 0.7-0.85 times width at base, widest just behind anterior margins of eyes; lateral margins raised and slightly converging basally; posterior margin transverse, carinate; anterolateral carinae strongly raised, extending from anterior ends of lateral margins to apex, slightly convex in dorsal view, moderately to strongly convex in lateral view; marginal carina just visible dorsally near eyes, situated well ventral to anterolateral carinae; Y-shaped carina strong, arms ca 0.5 times length of basal stem. Frons concave, broadly triangular; length in midline 0.9-1.1 times greatest width, this at or just below antennal bases, slightly concave in lateral view; sublateral carinae extending from just apical of greatest width to meet marginal carina ca 0.25-0.33 from inner ends; mediolateral carinae very strong and elevated in basal fifth, positioned about midway between lateral margins and midline, apical ends slightly curved inwards to meet apical margin ca halfway from midpoint to outer ends; median area narrowly triangular, length in midline 1.7-2.2 times greatest width, median carina absent. Antennal segment 1 1.9-3.0 times as long as wide with dorsal longitudinal ridge and anterior face somewhat flattened; segment 2 0.75-0.95 times length of segment 1, slightly expanded apically.

Thorax—Pronatal carinae very strong, median carina in lateral view straight except at ends. Mesonotal carinae very strong, median carina in lateral view strongly convex.

Tegmen—Subquadrate, reaching abdominal tergite 4, posterior margin transverse to slightly concave; venation coarsely reticulate, some strong longitudinal veins present; claval suture absent.

Abdomen—Tergites 4-8 strongly carinate medially, mediolateral carinae strong on tergites 4-7, weak on tergite 8. Anal segment of  $\delta$  ca as long as wide, collar-like. Pygofer with lateral angles acute, ventral margin broadly rounded to truncate. Genital styles in ventral view broad basally then narrowed (width of apical 1/2 ca half that of basal portion), contiguous in basal 1/2 then smoothly diverging before converging in apical 1/4, apices rounded and not quite meeting.

Dimensions—&: body length 3.1-4.7 mm, length of tegmen 1.2-1.4 mm; \( \varphi \): body length 4.5-5.5 mm, length of tegmen 1.3-1.6 mm.

## Etymology

The specific name is a Greek adjective for "living in or on mountains".

#### Notuchus kurandae Donaldson

Notuchus kurandae Donaldson, 1979:184.

Notuchus palmerstonensis Donaldson, 1979:184-185. Syn. n.

# Notes

This species is now known to occur between Tully and Cooktown and westwards to Mareeba at altitudes from sea level to 1200 m. Examination of morphological variation in the additional material showed that the differences between N. kurandae and N. palmerstonensis described by Donaldson (1979) on the basis of single specimens are no longer sufficient to maintain their specific status and N. palmerstonensis is synonymised with N. kurandae.

## Notuchus rotundifacies Donaldson

Notuchus rotundifacies Donaldson, 1979:184.

#### Note

Previously known only from the McIlwraith Range northeast of Coen, this species is now recorded from Iron Range, some 120 km northwards.

#### Notuchoides gen. n. (Figs 9-16)

Type species Notuchoides montanus sp. n.

Form ovate, ca twice as long as broad. Head in lateral view angulate, slightly acute. Vertex shorter than broad, widest adjacent to anterior margins of eyes with paired anterolateral carinae extending from basal half

of lateral margins to apical margin near apex, Y-shaped carina present. Frons with length in midline longer than greatest width (this in apical 1/2), with paired submedian carinae; median carina present. Clypeus tricarinate. Rostrum long, extending beyond hind trochanters. Ocelli absent. Antennae reaching level of apex of clypeus; segment 1 cylindrical ca 3 times as long as wide, equal to or longer than segment 2; segment 2 swollen except at base, more than twice as long as wide. Pronotum short, much wider than head, disc tricarinate, lateral carinae curved laterad and reaching posterior margin; anterior margin convex; posterior margin shallowly concave; impressions present behind eyes; lateral margins carinate. Mesonotum tricarinate, ca half as long as wide; lateral carinae straight, diverging posteriorly, reaching posterior margin. Hind tibia laterally trispinose, with 4 large and 1 small central apical spine; spur quadrangular in cross-section; basal metatarsal segment longer than remaining segments together with 4 apical and 1 subapical spine. Tegmen short, not reaching posterior margin of abdominal tergite 4, coriaceous, subquadrate, costal margin strongly inflected; hind wings absent. Abdominal tergites with median and mediolateral carinae.

#### Notes

The quadrangular (in cross-section) post-tibial spur and absence of a lateral carina on the gena places this genus in the tribe Ugyopini (Fennah 1979; Asche 1985), where it resembles *Notuchus*. It differs from *Notuchus* in lacking the sublateral carinae on the frons, the more elongate frons, the narrower vertex and the less acute apex of the head in lateral view.

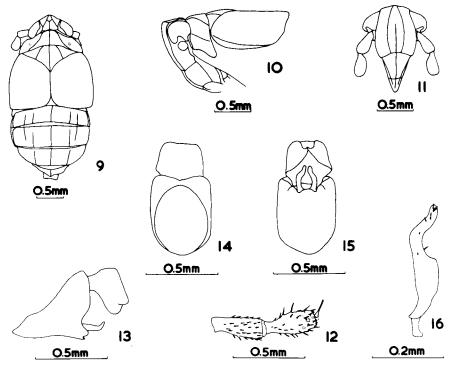
## Etymology

The generic name refers to its likeness to Notuchus. Masculine.

# Notuchoides montanus sp. n. (Figs 9-16)

Types—New Caledonia: holotype &, labelled "Mt Mou Summit 24 May 1984 G. Monteith & D. Cook", "QM Berlesate No. 659 22.04S 166.21E Rainforest, 1200 m Litter" in QM (T.10945); paratype &, same data, in QM (T.10946).

Colour—Variable, ranging from dark brown (with frons, clypeus and coxae mid brown and rostrum, legs and pygofer light brown) to light brown (with anterior 2/3 of pronotum, mesonotum and anterior portion of tergites dark brown).



Figs 9-16—Notuchoides montanus: (9) body, dorsal view; (10) head, pronotum, mesonotum and tegmen, lateral view; (11) frons and clypeus; (12) antenna; (13-16) & genitalia: (13) lateral view; (14) dorsal view; (15) ventral view; (16) left style.

Head—Head width across eyes 0.7 times that of pronotum. Vertex with length in midline 0.9-0.95 times width at base, narrowest ca 1/3 from base; apex broadly rounded, apical margin straight to slightly concave laterally; lateral margins distinctly concave; posterior margin transverse with median area concave or not; anterolateral carinae straight to slightly concave, meeting lateral margins 1/3 from posterior ends; Y-shaped carina with stem ca half basal width of vertex and 2.5-3.0 times length of arms. Frons slightly convex in lateral view; length in midline 1.1-1.2 times greatest width (this ca 1/3 from apex); apical margin concave, basal margin convex; lateral margins convex in apical 2/3 and concave in basal 1/3 adjacent to eyes; submedian carinae convex in apical 2/3 and straight or concave in basal 1/3, meeting apical margin ca 1/4 from midpoint, at most separated by 0.4-0.45 times greatest width of frons; median carina present in basal portion; median and lateral areas shallowly concave, median area slightly raised above lateral areas. Clypeus convex in lateral view, width at base slightly narrower than width of frons at apex. Antennal segment 1 3 times as long as wide with weak dorsal longitudinal ridge, 1.0-1.1 times length of segment 2; segment 2 2.2-2.3 times as long as wide wide.

Thorax—Carinae very strong. Pronotum with length in midline equal to length of vertex in midline and 0.25 times width at posterior ends of lateral margin.

Legs-Hind legs with femur 0.75 times length of tibia.

Tegmen—1.1-1.2 times as long as wide, just reaching tergite 4; posterior margin transverse with angles rounded; venation coarsely reticulate; claval suture absent.

Abdomen—Tergites 4-5 with 2 pairs of mediolateral carinae (outer pair incomplete) posteriorly on tergite 4 and anteriorly on tergite 5. Anal segment of  $\delta$  slightly wider than long, collar-like. Pygofer with short broadly rounded median projection and rounded triangular lateral projections. Genital styles in ventral view broad basally then narrowed (width of apical 1/2 ca half that of basal portion), contiguous basally, inner margins strongly convex just past midpoint with apical 1/4 recurved, apices nearly meeting; apices curved dorsally in lateral view.

Dimensions-5: body length 3.0-3.2 mm, length of tegmen 1.0 mm.

### Etymology

The specific name is a Latin adjective for "of mountains".

# Kiambrama gen. n. (Figs 17-35)

Type species Kiambrama hylonoma sp. n.

Head width across eyes narrower than pronotum. Vertex longer than pronotum, extending just anterior to eyes, length in midline equal to or longer than width at base, widest at apex; apex broadly and evenly rounded, much wider than base; anterolateral carinae distinct, meeting well before apex; carination anterior to anterolateral carinae obsolete or almost so; Y-shaped carina faint or absent, basal compartment shorter than wide, posterior margin positioned near midpoint of eyes. Frons broadly rounding into vertex, length in midline < 1.5 times greatest width (this ca 1/3 from apex); paired submedian carinae present. Clypeus tricarinate, width at base equal to that of frons at apex. Rostrum long extending to or beyond hind trochanters. Ocelli present. Antennae with segments cylindrical, total length equal to that of frons; segment 1 longer than wide, segment 2 at least 3 times as long as wide and ca twice length of segment 1. Pronotum tricarinate, lateral carinae curved laterally in posterior 1/2 to meet posterior margin adjacent to tegulae; 2 impressions present on median disc, 1 each side of median carina; posterior margin shallowly concave medially. Mesonotum slightly wider between tegulae than length in midline with 5 carinae, outer pair convex, diverging and meeting posterior margin. Hind tibae laterally trispinose, with 4 large and 1 small central apical spine; spur quadrangular in cross-section; basal metatarsal segment longer than remaining segments together with 4 apical and 1 subapical spine. Tegmen extending beyond apex of abdomen, claval suter present. Anal segment of & collar-like.

# Note

This genus also belongs to the Ugyopini. In Fennah's (1956) key to Australian and Pacific Islands genera, it runs to *Perimececra* Muir (Ceram) but can be distinguished by its broader frons, shorter clypeus, much shorter second antennal segment and simpler apical venation of the tegmen.

# Etymology

The generic name is derived from an aboriginal name for dense forest. Feminine.

# Key to species of Kiambrama

# Kiambrama hylonoma sp. n. (Figs 17-25)

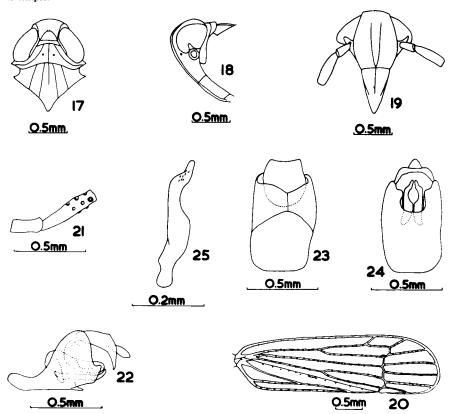
Types—Queensland: holotype 3, labelled "NE Qld. 3.5 km W of Cape Tribulation, (Site 7) 2 Oct. 1982, 680 m, Monteith, Yeates & Thompson Pyrethrum knockdown, RF", in QM (T.10947); paratypes: 1 δ, McIlwraith Ra. via Coen, 1.vii.1976, J. F. Donaldson, at light (QDPI); 1 ♀, Mossman Gorge, 21.iv.1967, D. H. Colless (ANIC).

Colour—Vertex dark brown except area adjacent to posterior margin and marginal carinae posterior to posterior margin light brown. Frons dark brown except median third between submedian carinae and lateral margins black and narrow white band at apex. Clypeus yellowish brown but darker towards apex. Genae dark around ocelli and adjacent to eyes. Antennae with a dark band and an incomplete band on ventral surface at base of segment 1; segment 2 pale dorsally with dark stripe on ventral surface in basal half, generally darker around sensillae. Pronotum pale with lateral carinae and area anterior to and adjacent to lateral carinae dark. Mesonotum dark brown but posterior margin lighter. Legs pale, without banding. Abdomen dark ventrally except for pale posterior margins of segments; pygofer dark at base, lighter towards apex; anal segment dark. Tegmen hyaline with 2 dark spots at claval fork and between claval vein and margin near apex of claval vein; veins dark except for light sections on or adjacent to cross veins. Female generally lighter; frons with white spot in each half of black area; antennae with apical band of segment 1 incomplete dorsally and segment 2 darker between sensillae.

Head—Head width across eyes 0.90-0.97 times width of pronotum. Vertex with length in midline 1.3-1.4 times width at base; lateral margins slightly concave and converging towards base; posterior margin transverse or very slightly concave; pair of short submedian carinae anterior to anterolateral carinae but obsolete at apex; basal compartment ca 0.65 times as long as wide. Frons with length in midline 1.2-1.4 times greatest width; submedian carinae obsolete in basal 1/3, meeting before apex but not quite reaching apical margin; area between lateral margins and submedian carinae shallowly concave. Rostrum reaching to level of hind trochanters. Antennae 0.9-1.0 times length of frons; segment 1 2.1-2.4 times as long as wide; segment 2 3.5-4.2 times as long as wide and 2.0-2.3 times length of segment 1.

Thorax—Pronotum with lateral carinae straight anteriorly. Mesonotum with inner pair of carinae convex, diverging and meeting posterior margin.

Tegmen—Cu forked at level of R fork and distal to claval fork; M forked; 1 row of cross veins; apical veins simple.



Figs 17-25—Kiambrama hylonoma: (17-18) head, pronotum and mesonotum: (17) dorsal view; (18) lateral view; (19) frons and clypeus; (20) tegmen; (21) antenna; (22-25) & genitalia: (22) lateral view; (23) dorsal view; (24) ventral view; (25) left style.

Abdomen—Anal segment of & broader than long. Pygofer with lateral angles rounded and slightly obtuse; ventrolateral angles acute; median process very short and broad, within deep emargination of ventral margin, apex shallowly concave. Genital styles in ventral view very broad at base and diverging to ca level of ventrolateral angles of pygofer, outer margins subparallel, then strongly curved inwards with apical fifth recurved, apices meeting.

Dimensions— $\eth$ : body length 3.1 mm, length of tegmen 3.8 mm;  $\mathfrak{P}$ : body length 3.6 mm, length of tegmen 3.8 mm.

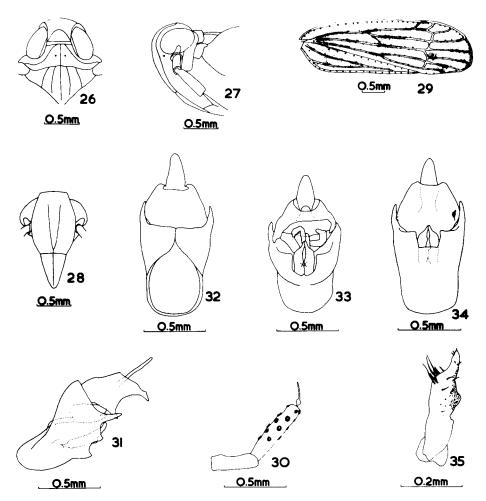
# Etymology

The specific name is the Latinised form of the Greek adjective hylonomos (forest-dwelling).

## Kiambrama longirostrata sp. n. (Figs 26-35)

Types—Queensland: holotype  $\delta$ , labelled "NE Qld, 4.5 km W of Cape Tribulation (Site 9) 23 Sept.-7 Oct. 1982, 760 m, Monteith, Yeates & Thompson, Rainforest pitfall traps" in QM (T.10948); paratype  $\mathfrak{P}$ , Mt Finnigan, 20.xii.1982, L. Roberts, 1100 m, in QM (T.10949).

Colour—Head mostly deep brownish orange. Frons with dark brown areas laterally anterior to eyes and antennae, in females forming a very broad diffuse dark brown to black band; apex of frons and base of clypeus paler. Clypeus darker towards apex. Genae dark brown between eyes and frons above ocelli. Segment 1 of



Figs 26-35—Kiambrama longirostrata: (26-27) head, pronotum and mesonotum: (26) dorsal view; (27) lateral view; (28) frons and clypeus; (29) tegmen; (30) antenna; (31-35) & genitalia: (31) lateral view; (32) dorsal view; (33) posterolateral view; (34) ventral view; (35) left style.

antennae with broad brown stripe on anterior face; segment 2 with dark band at base expanded on anterior face, apical half dark brown with apex narrowly white; sensillae white. Pronotum whitish posterior to lateral carinae, remainder brown with dark areas lateral to anterior ends of lateral carinae and ventrally to eyes. Mesonotum varying from light brown with darker anterior and lateral areas to nearly totally dark brown; tegulae light brown with dark brown area midway along posterior margin. Legs light brown with fore legs somewhat darker; tibiae slightly darker at base; fore coxae mid brown and with darker brown to nearly black area on pleura and the darker clypeal apical area producing a curved band on ventral surface; remainder of ventral surface of thorax brown with extensive whitish areas. First visible sternite of abdomen mostly brownish orange with 2 or 3 dark areas; other sternites dark brown with light areas laterally progressively decreasing, posterior margins medially whitish; females with much more brown on first visible sternite. Genitalia brown with some margins whitish. Tegmen hyaline; margins with orange tinge; veins with dark brown and whitish sections; dark colouration of veins extending onto membrane; hairs nearly black.

Head—Head width across eyes 0.7-0.8 times width of pronotum. Vertex with length in midline 1.0-1.1 times width at base; lateral margins distinctly concave, parallel at base; posterior margin transverse; basal compartment 0.4-0.5 times as long as wide. Frons with length in midline 1.3-1.4 times greatest width; submedian carinae weak, indistinct at base, meeting just before and reaching apical margin; frons distinctly concave throughout. Rostrum extending posterior to hind trochanters. Antennae 0.9-1.0 times length of frons; segment 1 2.0-2.4 times as long as wide; segment 2 3.6-4.3 times as long as wide and 1.7-1.9 times length of segment 1.

Thorax—Pronotum with anterior margin slightly convex; lateral carinae straight or slightly convex anteriorly. Mesonotum with inner pair of carinae convex, posterior ends not diverging or meeting posterior margin.

Tegmen—R forked basal to claval fork; Cu forked apical to claval fork; M forked; 1 row of cross veins; apical veins simple.

Abdomen—Anal segment of & broader than long; left ventrolateral margin produced into strong broad spine directed ventrally; right ventrolateral margin produced into a smaller spine directed posterolaterally and medially. Pygofer with lateral angles produced into acute spines; ventrolateral angles slightly acute; ventral margins transverse within deep emargination. Genital styles in ventral view broad; inner and outer margins more or less parallel in basal 3/4; inner margin with broad posteriorly directed process at midpoint; outer margin strongly concave in apical 1/4 to produce acute apex; apex slightly curved dorsally; apices meeting.

Dimensions—5: body length 3.0 mm, length of tegmen 3.8 mm, 9: body length 3.5 mm, length of tegmen 3.9 mm.

#### Etymology

The specific name is a noun in apposition and refers to the long rostrum.

#### Discussion

Although various classifications of the Delphacidae have been proposed, resulting in its division into from 3 to 10 subfamilies, the composition of the Asiracinae has remained virtually unchanged. Fennah (1979) divided the Asiracinae into 2 tribes, Asiracini (8 genera) and Ugyopini (16 genera). Asche (1985) retained this tribal arrangement but transferred 2 of Fennah's ugyopine genera to Asiracini. With synonymies and the erection of new genera since 1979, the tribes now contain 10 and 13 genera respectively.

The distributions of the 2 tribes overlap only in the Neotropical Region. The Asiracini occur in the Nearctic, Palaearctic, Ethiopian and Neotropical Regions while the Ugyopini are restricted to the Oriental, Australian and Pacific Regions except for Neopunana Asche and Canyra Stål and certain species of Ugyops which occur in the Neotropical Region. All of the Australian species have been found in the eastern coastal areas of northern New South Wales and Queensland and on Lord Howe and Norfolk Islands. The only genus endemic to Australia is Kiambrama. Notuchus is known only from Australia and New Caledonia and Notuchoides is endemic to New Caledonia. The third genus known to occur in Australia is Ugyops.

Notuchus and Notuchoides appear to be closely related. Both have very reduced tegmina without distinct venation and lack hind wings. They also differ from other Ugyopini (except Melanugyops Fennah) by having only 3 mesonotal carinae instead of 5. All species of these 2 genera except Notuchus larvalis were collected from leaf litter or moss at various altitudes. N. larvalis is exceptional and is a cave-dweller with reduced eyes, unfortunately nothing is known of its biology.

## Acknowledgments

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