

FOUR NEW SPECIES AND NEW RECORDS OF AUSTRALIAN MASTOGENIINAE (COLEOPTERA: BUPRESTIDAE)

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Abstract

Four new species of *Helperella* Cobos are described and figured: *H. macalpinei* and *H. webbensis* from north Queensland; *H. manningensis* and *H. miyal* from New South Wales. *Mastogenius frenchi* Thery is transferred to *Helperella*. The genus is diagnosed and a key to all 5 species given. The relationships and generic composition of the Mastogeniinae are discussed.

Introduction

The buprestid subfamily Mastogeniinae LeConte and Horn is characterised by very small, normally black beetles, in which the mesosternum is reduced, the basal margin of the pronotum is almost truncate and which share with the Agrilinae double lateral carinae on the pronotum. Cobos (1980, 1981a), in his revised subfamily classification, keyed and figured Mastogeniinae and removed it from close affinity with Agrilinae. Because of their shape and size, Mastogeniinae superficially resemble some Elateroidea rather than Buprestidae. On the basis of wing venation and wing folding pattern, *Mastogenius* Solier has, in the past, even been excluded from the Buprestidae (Good 1925; Forbes 1942).

The world mastogeniine fauna is largely concentrated in the Americas and Africa and most species are currently placed within *Mastogenius*. Cobos (1981b) synonymised *Exaesthetus* Waterhouse, *Micrasta* Kerremans and *Sicardia* Thery with *Mastogenius* and *Pseudianthe* Fairmaire with *Ankareus* Kerremans. Holynski (1984) reduced *Ankareus* to a subgenus of *Mastogenius*. Toyama (1983) erected 2 new genera, *Neomastogenius* and *Siamastogenius*, for new species from south east Asia and resurrected *Haplostethus* Le Conte from earlier synonymy with *Mastogenius* to include Japanese and North American species. Bellamy and Williams (1985) removed *Maoraxia* Obenberger from the Mastogeniinae to Anthaxiae—Buprestinae. Clearly the higher mastogeniine taxonomy is still in a state of flux.

Mastogenius frenchi Thery, the only previously described Australian mastogeniine, is transferred to *Helperella* Cobos and 4 new species described: *macalpinei*, *manningensis*, *miyal* and *webbensis*. The nearest geographic relatives of these species are *H. diana*e Cobos from north western New Guinea (Cobos 1957) and several undescribed mastogeniines from Fiji (C. L. Bellamy and B. Levey pers. comm.). There are no biological data available for the Australian species, but Baker (1972) indicated that North American *Mastogenius* breed in "small branches of oak".

A feature of the described Australian Mastogeniinae is the presence of well defined hypomeral grooves to receive the antennae at rest and is a character otherwise only recorded in *H. diana*e Cobos, the unique holotype of which was examined. In addition *Helperella* possesses deep genal grooves which sharply excise the lower ocular margins and which receive the first 2 antennal segments at rest. A specimen of *Mastogenius parallelus* Solier, the type species of *Mastogenius*, has been examined and while it possesses genal grooves these are shallower and do not form sharply defined excisions abutting the lower eye margins. *M. parallelus* at most possesses only a rudimentary hypomeral groove. The Australian mastogeniine fauna appears to fit better into *Helperella* than *Mastogenius*.

Abbreviations: AM, Australian Museum, Sydney; ANIC, Australian National Insect Collection, Canberra; BM, British Museum (Natural History), London; GWC, G. Williams Collection, Lansdowne, N.S.W.; MNHN, Museum National d' Histoire Naturelle, Paris; SWC, S. Watkins Collection, Sydney.

Key to Australian species of *Helperella*

1. Mesosternum completely divided, widely separated by the prosternal process, the mesosternal halves not meeting in the middle;

- sternal cavity formed by metasternal lobe and mesosternal halves 2
- Mesosternum nearly divided but the 2 halves meet finely in the middle (forebody may need to be depressed to view this character); sternal cavity formed entirely by mesosternum 3
2. Head longitudinally impressed; frons medially impressed and slightly swollen laterally; lateral prosternal impressions for fore tarsi at rest well defined internally; basal elytral impression not continuous from humeral callus to scutellum; (Figs 9-11); aedeagus Fig. 5; north Qld **macalpinei** sp. n.
- Head not longitudinally impressed; frons neither impressed nor laterally swollen; lateral prosternal impressions poorly defined internally; basal elytral impression continuous from humeral callus to scutellum; (Figs 6-8); aedeagus Fig. 1; north Qld **webbensis** sp. n.
3. Form robust, ratio of body length: width of elytra across humeri, 2.4:1; punctuation of head regularly spaced on vertex; lateral margins of prosternal process constricted between procoxae; medial impression of head extending forward between antennal insertions to clypeus; (Figs 12-14); aedeagus Fig. 2; northern N.S.W. **miyal** sp. n.
- Form more elongate, ratio of body length: width of elytra across humeri, 2.8:1; punctuation of head irregular on vertex, intervening impunctate areas distinct; lateral margins of prosternal process not constricted between procoxae; medial impressions of head not extending forward past antennal insertions 4
4. Elytral surface generally smooth between punctures; elytral setae obscure; lateral pronotal margins narrowed in front, widest in basal half; (Figs 15-17); aedeagus Fig. 3; northern N.S.W. **manningsensis** sp. n.
- Elytral surface variably rugulose between punctures; elytral setae moderately long and obvious; lateral pronotal margins widest at about middle; (Figs 18-20); aedeagus Fig. 4; southern N.S.W., Vic. **frenchi** (Thery)

Helperella Cobos

Helperella Cobos, 1957: 91. Type species *Helperella dianae* Cobos, 1957: 93, by monotypy.

Body small, subparallel, elongate—ovate. Head small, distinctly narrower than base of pronotum; frons moderately compressed between antennal insertions, anterior edge of clypeus deeply excised, labrum clearly visible; genae with distinct impression for antennal segments 1, 2 at rest; eyes oblique, slightly converging above, lower margin sharply delimited by deep genal groove. Antennae: segment 1 pear-shaped, longer than any other segment; segment 2 globular; segment 3 elongate, slightly distally expanded; segment 4 variably subserrate; segments 5-10 distinctly serrate. Pronotum convex, disc slightly flattened; basal angles obtuse; basal margin almost truncate; lateral and sublateral carinae well defined; submarginal carinae continuous from base to near anterior margin. Elytra convex in lateral profile, slightly flattened medially; subparallel, slightly wider at about middle than at base; base wholly or partly transversely impressed. Prosternum without gular lobe; disc convex; prosternal process slightly flattened distally. Hypomera with distinct grooves to receive antennae at rest, grooves extending below lateral pronotal margin.

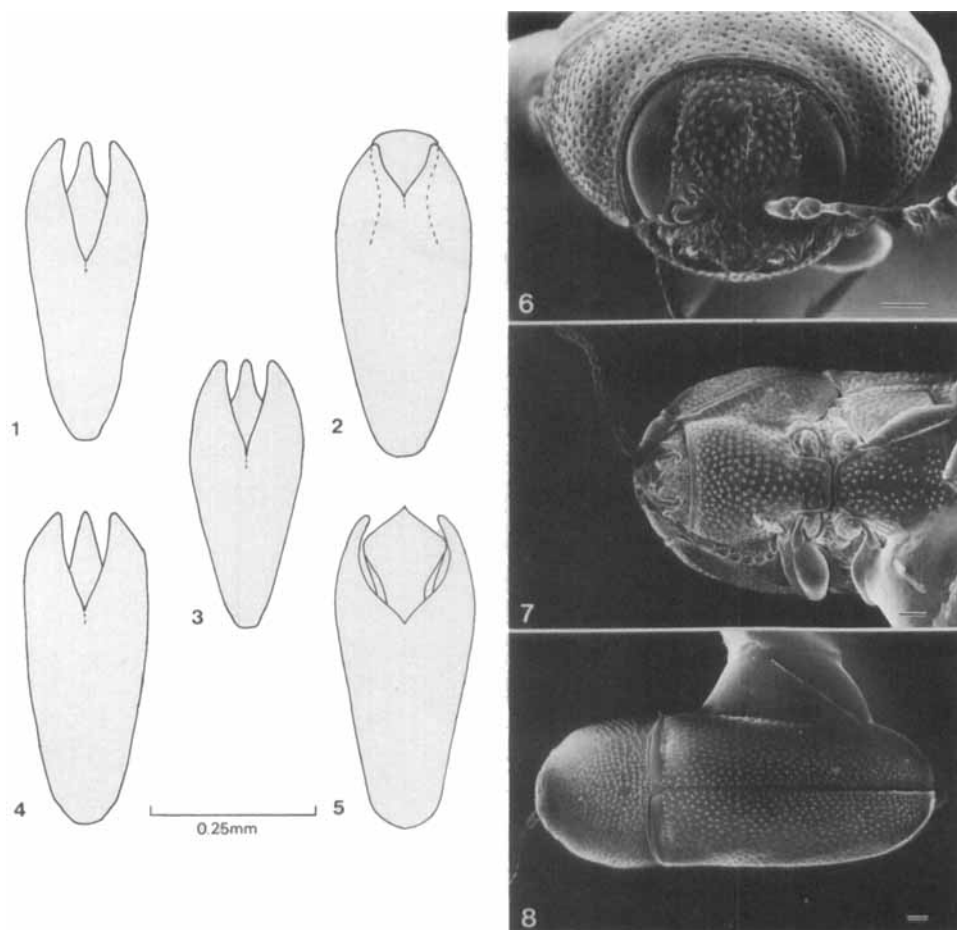
Helperella webbensis sp. n. (Figs 1, 6-8)

Type—QUEENSLAND: *holotype* ♂, 3 km NE of Mt Webb, N of Cooktown, 1-3.x.1980, T. Weir, in ANIC (ANIC No. 89).

Male

Length—2.3 mm. Body convex in lateral profile, entirely black, lustrous. Setose, but setae generally small and obscure.

Head—Small; dorsal anterior profile convex, moderately punctate, width of intervening spaces 1-2 times width of punctures themselves; frons not swollen laterally or medially impressed. Antennae at rest not reaching base of hypomera; distinctly setose from segment 5; segments 3, 4 and 5 approximately equal in length; segment 4 only slightly expanded distally.



FIGS 1-8—*Helferella* spp.: (1-5) aedeagus (dorsal); (1) *H. webbensis*; (2) *H. miyal*; (3) *H. manningensis*; (4) *H. frenchi*; (5) *H. macalpinei*; (6-8) *H. webbensis*: (6) frontal view; (7) ventral view; (8) dorsal view. (Scale 0.10 mm.)

Thorax—Pronotal surface setose, setae silver and slightly obscure; surface punctate anteriorly, remainder rugulose forming concentric rings; anterior margin straight, not at all produced in front; lateral margins evenly rounded, widest behind middle; lateral carinae about 1.5 times wider at apex than at base, widest in front of middle. Elytra basally as wide as base of pronotum; humeral calli distinct, slightly impressed behind calli; humeral angles slightly wider than base of elytra but narrower than widest point of lateral pronotal margins; base smooth, impunctate but with deep transverse impression from scutellum to humeral callus; surface lustrous and regularly punctate, punctures small, circular, separated by about twice their width; lateral margins subparallel to near apices, which are evenly rounded. Scutellum triangular, lustrous, impunctate. Ventral surface punctate, setose, but setae obscure; metasternal disc relatively smooth and lustrous, punctures widely separated. Prosternum convex, densely but shallowly punctate, weakly and obscurely setose; slight impression laterally adjoining procoxae to receive tarsi at rest, impression weakly defined internally; anterior margin weakly concave; distal margin of prosternal process almost straight, lateral margins nearly parallel. Hypomera punctate—granulate, with distinct grooves to receive antennae at rest, grooves extending below pronotal margin for about half the length of margin.

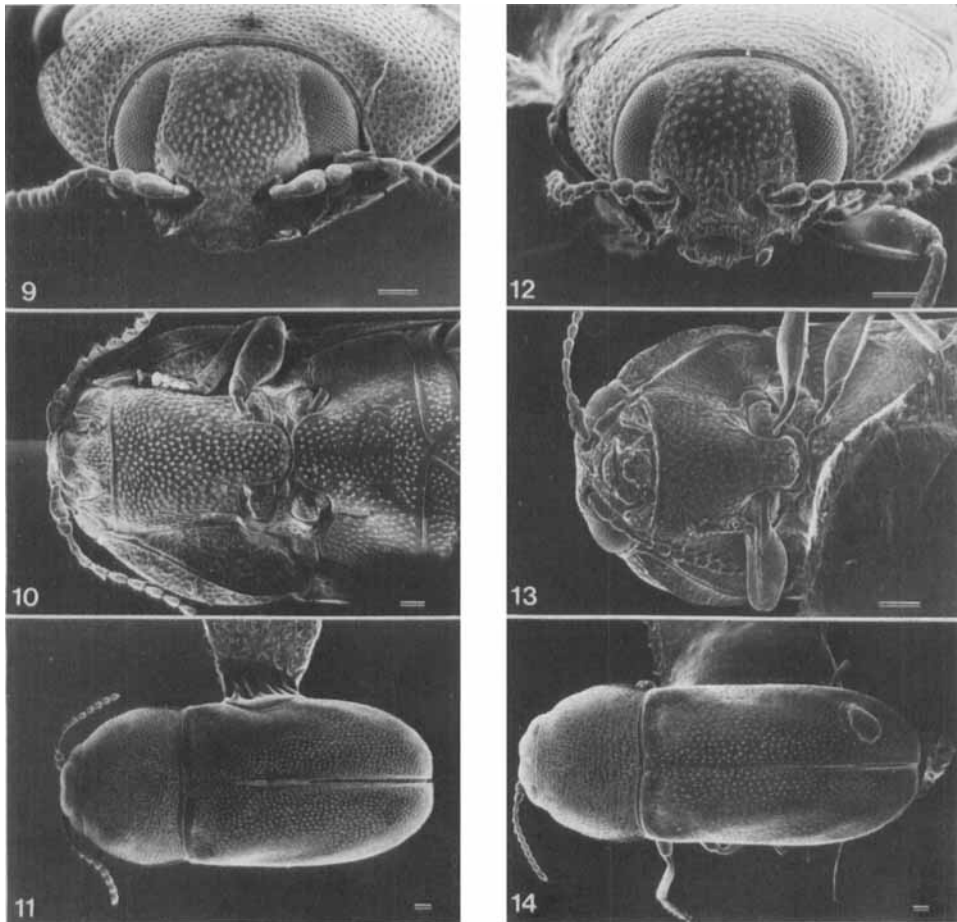
Aedeagus—As in Fig. 1.

Female

Unknown.

Notes

H. webbensis can be distinguished from *H. diana* and *H. macalpinei* by its rounded and unimpressed frons which is not laterally swollen. In *H. diana* and *H.*



FIGS 9-14—*Helperella* spp.: (9-11) *H. macalpinei*: (9) frontal view; (10) ventral view; (11) dorsal view; (12-14) *H. miyal*: (12) frontal view; (13) ventral view; (14) dorsal view. (Scale 0.10 mm.)

macalpinei the prosternal tarsal impression is more internally defined and the elytral punctation is coarser and the intervening spaces more rugulose.

***Helperella macalpinei* sp. n.** (Figs 5, 9-11)

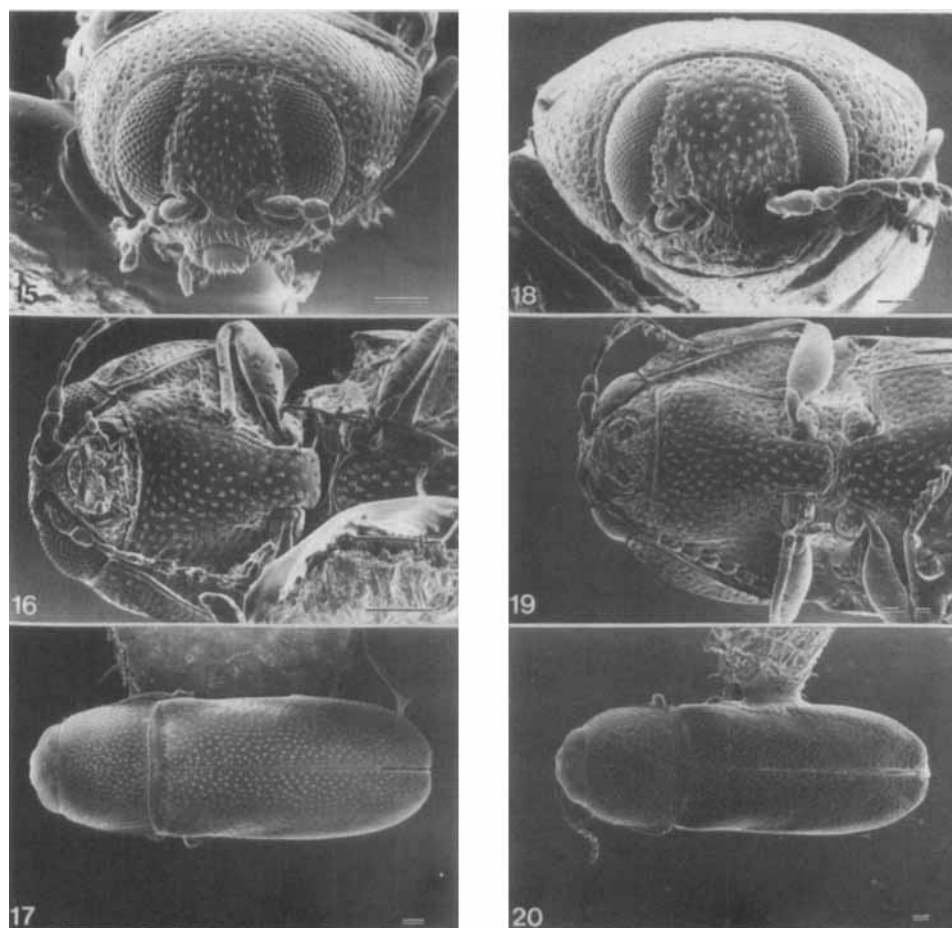
Types—QUEENSLAND: *holotype* ♀, Kuranda, 26.xii.1958, D. K. McAlpine, in AM; *paratype*: 1 ♂, Cairns, Feb. 1948, J. G. Brooks, in ANIC.

Adult

Length—3.1 mm. Body slightly convex in lateral profile, entirely black, slightly lustrous. Setose but setae generally small and obscure.

Head—Small; longitudinally impressed between eyes; dorsal anterior margin slightly emarginate; punctate, punctures generally separated by 1-2 times their width; frons laterally swollen, medially impressed. Antennae at rest not reaching base of hypomera; distinctly setose from segment 5; segment 4 subserrate, equal to or slightly shorter than segment 5.

Thorax—Pronotal surface setose, setae silver and obscure; surface punctate anteriorly, remainder punctate-rugulose forming concentric rings; anterior margin almost straight, basal margin almost truncate, lateral margins rounded, widest at about middle; lateral double carinae about twice as wide at apex as at base, strongly narrowed behind middle. Elytra basally as wide as base of pronotum; humeral calli small but distinct; slightly impressed behind each callus; base rugulose, but each elytron with a vague impression extending from internal margin of each callus to mid point of basal margin, not extending to scutellum; surface semi lustrous; distinctly and regularly punctate, punctures small, circular, separated by more than twice their width; intervening spaces variably rugulose; lateral margins slightly expanded to about two-thirds



Figs 15-20—*Helferella* spp.: (15-20) *H. manningensis*: (15) frontal view; (16) ventral view; (17) dorsal view; (18-20) *H. frenchi*: (18) frontal view; (19) ventral view; (20) dorsal view. (Scale 0.10 mm.)

distad, then rounded to apices which are subtruncate. Scutellum triangular, semi lustrous, granulose. Ventral surface punctate and variably rugulose, punctures on prosternal process and disc of metasternum more widely spaced; intervening spaces granulose-granulate; subnitid. Prosternum convex, punctate, with lateral impression adjoining procoxae to receive tarsi at rest, impression well defined internally; lateral margins of prosternal process parallel, distal margin rounded; anterior margin vaguely concave. Hypomera with punctation ocellate, intervening spaces granulate, with distinct grooves to receive antennae at rest, grooves extending below lateral pronotal margin for about two-thirds its length.

Aedeagus—As in Fig. 5.

Notes

In dorsal profile *H. macalpinei* resembles *H. miyal* but can be separated by its fully divided mesosternum, less punctate prosternal process and absence of a fully transverse basal impression on the elytra. It can be distinguished from *H. diana* by the more robust form of the elytra and absence of fully transverse basal impression.

The sclerotic tube (tegmen) of the aedeagus is distinctive in being concave dorsally and in having its lateral margins reflexed below the subapical expansion (Fig. 5).

Helferella miyal sp. n. (Figs 2, 12-14)

Types—NEW SOUTH WALES: *holotype* ♂, Manning Point, ca 12 km E of Taree, 23.xii.1982, G. and T. Williams, in ANIC (ANIC No. 90); *paratypes*: 1 ♂ (damaged), 1 ♀, Harrington, 4.i.1983, G. and T. Williams, in GWC.

Adult

Length—2.7 mm. Body convex in lateral profile, entirely black, lustrous. Setose, but setae generally small and obscure.

Head—Small; anterior margin emarginate in dorsal profile; punctate, punctures separated by 1-2 times their width; surface generally glabrous; vaguely impressed longitudinally on vertex; frons laterally swollen, medially impressed, this extending to face. Antennae at rest nearly reaching base of hypomera; distinctly setose from segment 5; segment 4 slightly expanded distally, approximately as long as segment 5.

Thorax—Pronotal surface setose, the setae silver and obscure; surface punctate—rugulose anteriorly, remainder rugulose; anterior margin almost straight; lateral margins almost straight along basal half, then rounded in front, at times slightly sinuate behind middle; widest at about middle; lateral carinae little wider apically than at base. Elytra basally as wide as base of pronotum; humeral angles not wider than widest point of lateral pronotal margins; humeral calli small but distinct, slightly impressed behind; base smooth, impunctate, but with transverse impression from humeral calli to scutellum; surface lustrous; distinctly and regularly punctate, punctures small, circular, separated by more than twice their width; intervening spaces smooth; lateral margins slightly expanded to about two-thirds distad, then rounded to apices which are subtruncate. Scutellum triangular, lustrous, impunctate. Ventral surface punctate, variably rugulose and setose, setae small and obscure; metasternum less punctured, intervening spaces subnitid. Prosternum convex; densely but shallowly punctate; rugulose; with slight lateral impression adjoining procoxae to receive tarsi at rest, impression well defined internally; lateral margins of prosternal process distinctly divergent anteriorly, constricted between procoxae; distal margin of process slightly rounded. Hypomera punctate, slightly rugulose, with distinct grooves to receive antennae at rest, grooves extending below lateral pronotal margin for about two-thirds its length.

Aedeagus—As in Fig. 2.

Notes

H. miyal can be distinguished from the two other southern species, *H. manningensis* and *H. frenchi*, by its more oval, less parallel form and more regularly punctate head. *H. miyal* is distinct from the other known Australian species in having the sclerotized tube of the aedeagus broad at the apex and constricted behind (Fig. 2).

Etymology

The specific name is an aboriginal word meaning "a stranger". All specimens were taken in small littoral rainforest remnants at the mouth of the Manning River, northern New South Wales.

***Helperella manningensis* sp. n. (Figs 3, 15-17)**

Types—NEW SOUTH WALES: *holotype* ♂, Harrington, 25.xii.1982, G. and T. Williams, in ANIC (ANIC No. 91); *paratypes*: 1 ♂, Harrington, 23.xii.1982, in GWC; 1 ♀, Harrington, 25.xii.1982, in GWC; 1, Harrington, 4.i.1983, in SWC; 1 ♀, 3 km NE of Harrington, 27.xii.1984, in AM; all G. and T. Williams.

Adult

Length—2.2 mm. Body convex in lateral profile, entirely black, lustrous. Setose but setae generally small and obscure.

Head—Small; feebly impressed between eyes; moderately punctate, punctures variably spaced, the intervening spaces 1-4 times wider than width of punctures; discal punctation widely spaced, intervening spaces smooth; frons swollen laterally resulting in an anterior emargination in dorsal profile. Antennae at rest nearly reaching base of hypomera; distinctly setose from segment 5; segment 4 slightly expanded distally, equal in length to segment 5 which is longer than any of remaining segments.

Thorax—Pronotal surface setose, setae silver and obscure; surface punctate anteriorly, remainder rugulose forming concentric rings; anterior margin almost straight, distinctly narrower than base; lateral margins rounded in front, nearly straight in basal half, occasionally slightly sinuate behind middle, widest in basal half; lateral carinae about as wide apically as at base, widest in front of middle. Elytra basally as wide as base of pronotum, slightly wider at humeral angles; humeral calli small but distinct; slightly impressed behind each callus; surface lustrous, distinctly and regularly punctate, punctures small, circular and separated by more than twice their width; intervening spaces smooth; lateral margins almost parallel to near apices which are subtruncate. Scutellum triangular, lustrous and impunctate. Ventral surface punctate, variably rugulose and setose, setae small and obscure; metasternum less punctate, intervening spaces smooth, lustrous, setae more evident. Prosternum convex; densely but shallowly punctate; moderately setose; with slight lateral impression adjoining procoxae to receive tarsi at rest; lateral margins of prosternal process well defined, slightly divergent anteriorly, not constricted between procoxae; distal margin of process almost truncate; anterior margin of prosternum slightly concave. Hypomera punctate, slightly rugulose with distinct grooves to receive antennae at rest, grooves extending below lateral pronotal margin for about half its length.

Aedeagus—As in Fig. 3.

Notes

H. manningensis is closely related to *H. frenchi* but can be distinguished by its less setose elytral surface which is not rugulose between punctures, the lateral pronotal margins which are not distinctly narrowed behind the middle and the less rounded distal margin of the prosternal process.

All specimens were collected in the vicinity of the mouth of the Manning River, northern New South Wales, in small littoral rainforest remnants.

Helferella frenchi (Thery) comb. n. (Figs 4, 18-20)

Mastogenius frenchi Thery, 1928: 456.

Types—VICTORIA: *holotype*, no locality or date, C. French, in MNHN (Thery collection); *paratypes*, same data, 1 in MNHN (Thery collection), 1 in BM; 1 in AM (ex Carter collection). The paratype in AM has been examined by the authors.

Additional material examined—NEW SOUTH WALES: 1 ♂, Merimbula, 12.v.1977, Z. Leipa, (ANIC); 1 ♀, Kangaroo Valley, north slope, 22.i.1971, S. Misko and K. Pullen, (ANIC); 1 ♀, Wahroonga, i.1939, H. J. Carter, "under leaves", (ANIC); 2, Cooper Park, Bellevue Hill, ii.1932, K. K. Spence, (AM).

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