

## A Revision of the Australian Ephemeroptera Genus *Atalomicria* Harker (Leptophlebiidae: Atalophlebiinae)

by

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I.C. Campbell and W.L. Peters: A Revision of the Australian Ephemeroptera Genus *Atalomicria* Harker (Insecta: Ephemeroptera: Leptophlebiidae: Atalophlebiinae).

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The Australian leptophlebiid genus *Atalomicria* Harker is redescribed and nymphal characters are incorporated. The nymph of *Atalomicria sexfasciata* is described for the first time, together with four new species, one from Victoria and three from southern Queensland. *Atalophlebia yugana* Harker is transferred to *Atalomicria*. A key to male imagines and nymphs of the genus is provided.

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### INTRODUCTION

The genus *Atalomicria* was established by Harker (1954) to encompass two species, *Atalomicria uncinata* and *A. sexfasciata*, which had been described as species of *Atalophlebia* by Ulmer in 1917. Ulmer's material included no nymphs and no nymphal characters were given in the original generic description. There has been no subsequent formal description of a nymph identified as *Atalomicria*, although several authors have illustrated parts of the nymph or included it in keys (Riek 1970, Williams 1980). Harker (1957) described a nymph and a female subimago collected near Sydney as *Atalophlebia yugana*. Although we have as yet no imagines of this species it is clear from Harker's illustrations and descriptions of the nymph and the wing venation of the subimago that it belongs in *Atalomicria* in which genus we formally place the species. Harker's type material could not be located in the British Museum where it is supposed to have been lodged.

The type localities for Ulmer's original species are somewhat enigmatic, possibly because the material was not collected by him. The locality for both *A. uncinata*, the type species, and *A. sexfasciata* is given as Cedar Creek, Queensland, where the species were collected in May and March respectively. Unfortunately there are numerous Cedar Creeks in Queensland (26 are listed in the gazetteer to the 1:250,000 map series), and that state is extremely large. Other species described in the same paper were collected at Atherton in January, Malanda in February and "Evelyne" in April. Atherton, Malanda and Evelyn Station are all localities on the Atherton Tableland, but the only Cedar Creek within 300 km appears to be

an intermittent stream which contained no mayflies when one of us (I.C.) visited it in November 1989. *A. sexfasciata* is widespread in northern Queensland, but, in spite of extensive collecting, the senior author was unable to collect *A. uncinata* from the region north of Townsville.

In this paper we redescribe the genus *Atalomicria* and describe four new species, three from southern Queensland and one from Victoria, as well as describing the nymph of *A. sexfasciata* (Ulmer) and adding to the description of the male imago of *A. uncinata*.

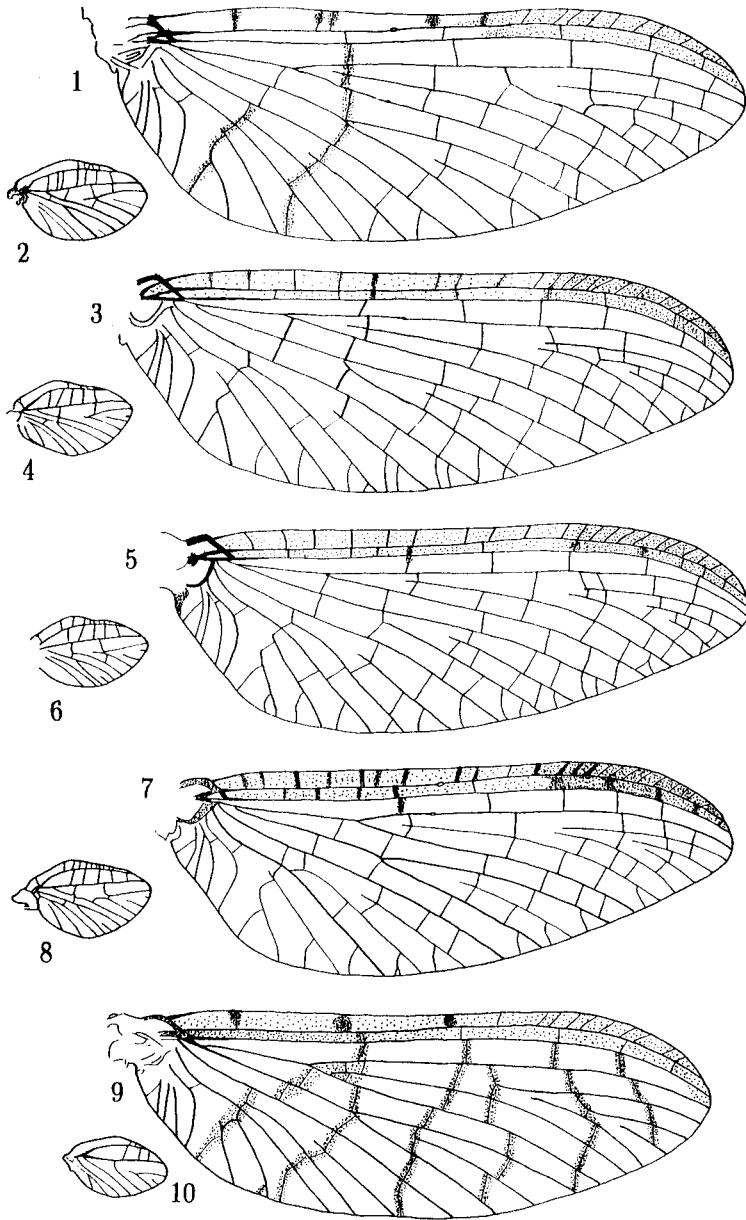
## METHODS

Material was prepared by the methods suggested by Edmunds, Jensen and Berner (1976) except for the eggs which were critical point dried before gold coating for scanning electron microscopy. Drawings were prepared either with the aid of a drawing tube attached to a stereomicroscope or a microprojector. Morphological terms and conventions are consistent with those used by Towns and Peters (1978). All types are preserved in alcohol with wings, legs and nymphal mouthparts mounted on slides. Unless indicated otherwise all material was collected by I. Campbell, and nymphs were associated with adults by rearing. Types of species described here have been lodged in the Museum of Victoria, other material examined is held by the Swedish Museum of Natural History, Stockholm, and this is indicated by SMNH in parentheses.

### *Atalomicria* Harker, 1954

*Imago.* Eyes of ♂ separated on meson by *ca* 0.5 x diameter or more, portions distinct with lower about 0.5-0.8 x diameter of upper. Forewings (Figs. 1, 3, 5, 7, 9) with vein Rs forked at 0.2-0.3 distance from base to margin, vein MA forked symmetrically at 0.4-0.5 distance from base to margin, vein MP not forked, MP<sub>2</sub> attached by crossvein to vein MP<sub>1</sub> at about 0.3 x distance from base to margin, vein ICu<sub>1</sub> linked to vein CuA by crossvein, vein ICu<sub>2</sub> linked to vein ICu<sub>1</sub> by a cross vein, a single cross vein usually linking ICu<sub>2</sub> to the wing margin. Crossveins in costal space simple, not anastomosed, those in basal half shaded. Hindwings (Figs 2, 4, 6, 8, 10) with apex acute, rounded, costal margin convex with apex of convexity 0.3-0.5 distance from base to apex. Forelegs of ♂ with ratios of segment lengths 0.68-0.85 : 1.0 : 0.016-0.040 : 0.33-0.48 : 0.36-0.43 : 0.26-0.39 : 0.10-0.13, tarsal claws (Fig. 11) of a pair similar, both hooked, one only with an opposing flange. Male genitalia (Figs. 17-22) with penes usually fused at least 0.6 x length, each bearing a terminal spine or hook. Forceps 3 segmented, basal segment *ca* 6 x length of segment 2, segments 2 and 3 subequal length. Width of styliger plate at least 2 x length. Sternite VII of ♀ (Figs. 23-26) projecting and slightly produced posteriorly as an egg guide. Sternite IX of ♀ cleft. Terminal filament and cerci long, of similar length.

*Nymph.* Head prognathous, antennae long, about 3 x head length. Mouthparts: labrum (Figs. 27-30) narrower than clypeus, lateral margins slightly divergent, dorsal surface with a subdistal row of hair, anterior emargination shallow, slightly



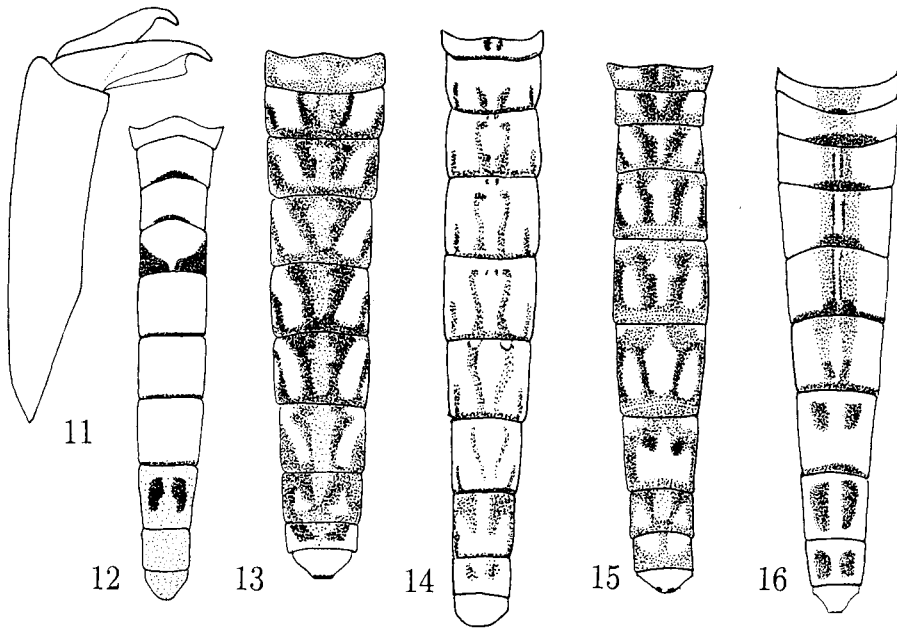
Figs. 1-10. Fore and hind wings of 1-2, *Atalomicria sexfasciata*; 3-4, *A. banjdlalama*; 5-6, *A. dalagara*; 7-8, *A. chessmani*; 9-10, *A. bisasciata*.

hooded, with 5 small unequally sized denticles; mandibles (Figs. 31-36) with outer margin fairly straight, multi-dentate outer canines, those on right mandible serrated posteriorly; lingua of hypopharynx (Fig. 37) with well developed lateral processes, submedian lobes with short hair barely visible, superlingua with dense hair row along apical margin, lateral margins blunt; maxillae (Fig. 38) with apical half of galea-lacinea expanded medially, with a subapical row of pectinate setae; total length of maxillary palps more than 2 x headwidth with segments 2 and 3 enormously extended, segment 3 short, bearing a tuft of fine hair; labial palpi (Figs. 39-42) with segment 3 flattened, bearing numerous short stout setae ventrally and tuft of long hair on the outer apex, glossae hairy, curved over ventrally, submentum with well developed marginal setae. Hair absent from lateral margins of abdominal segments. Legs (Figs. 43-49) with long narrow tarsal claws, denticles absent. Abdominal gills (Figs. 50-54) on abdominal segments I-VII alike, each with a pair of similar, elongate and generally parallel sided lamellae narrowing abruptly to a thin terminal filament, tracheae usually strongly pigmented, lamellae increasing in size from 1-3, then decreasing in size posteriorly. Posterolateral spines present on segments VII or VIII-IX, increasing in size posteriorly. Terminal filament longer than the cerci, all three with whorls of short hair at the posterior margin of each segment.

*Egg.* (Figs. 60-61). Ovoid, 150-200 $\mu$  x 75-90 $\mu$ , chorion tuberculate with numerous adhesion structures each consisting of a large central knob-terminated coiled thread (KCT) surrounded by a series of small tubercles arranged like petals of a daisy.

*Species included:* *Atalomicria uncinata* (Ulmer), 1917, *A. yugana* comb. nov. (Harker), 1957, *A. banjddjalama* sp. nov., *A. bifasciata* sp. nov., *A. chessmani* sp. nov., *A. dalagara* sp. nov.

*Comments.* Pescador and Peters (1980) placed *Atalomicria* in the *Hapsiphlebia* lineage [= "*Zephlebia cruentata*" lineage of Towns and Peters (1980)] along with the genera *Jappa* Harker, *Atalophlebia* Eaton, and *Ulmerophlebia* Demoulin. While we concur with the placement of *Atalomicria* in the *Hapsiphlebia* lineage, the entire lineage in the Southern Hemisphere needs additional study to re-define the synapomorphic characters. *Atalomicria* appears to be most closely related to the other Australian genera in the *Hapsiphlebia* lineage from which it may be distinguished by the following combination of characters. In the imago: (1) vein  $MP_2$  of forewings is attached by a crossvein to vein  $MP_1$  at about 0.3 x distance from base to margin (Figs. 1, 3, 5, 7, 9); (2) costal margin of hind wings is convex with apex of convexity 0.3-0.5 distance from base to apex (Figs. 2, 4, 6, 8, 10); (3) tarsal claws of a pair are similar and both are hooked, but only one with an opposing hook (Fig. 11); and (4) male genitalia bear a terminal spine or hook on each lobe of penes (Figs. 17-22). In the nymph: (1) clypeus is wider than labrum (Figs. 27 and 29); glossae of labium are curved over ventrally (Figs. 39 and 41); (2) claws do not possess denticles (Figs. 43-49); and (4) total length of maxillary palpi is more than 2 x headwidth (Fig. 38).



Figs. 11-16. Fig. 11, Tarsal claws of imago of *Atalomicria sexfasciata*. Figs. 12-16, Dorsal abdominal patterns of imagines of: 12, *Atalomicria sexfasciata*; 13, *A. banjidalama*; 14, *A. dalagara*; 15, *A. chessmani*; 16, *A. bifasciata*.

The genus is distributed along the east coast of mainland Australia from Victoria to northern Queensland.

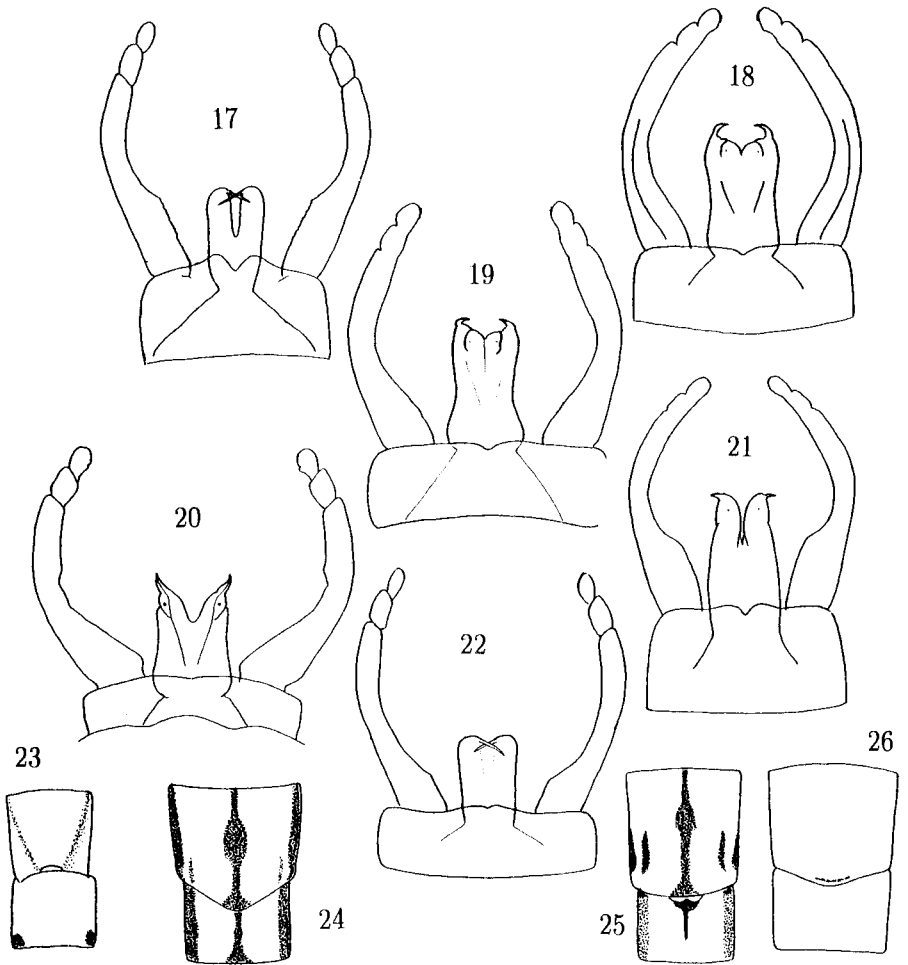
#### *Atalomicria uncinata* (Ulmer)

*Material Examined*: Holotype ♂, Queensland, Cedar Creek, May, coll. Dr Mjöberg's Swedish expedition to Australia, 1910-1913. (SMNH).

*Male Imago*. Eyes: upper lobe brown, diameter 1.2 x diameter of grey lower lobe, separated on meson by 0.7 x diameter. Forewings: length 9.3 mm, width 2.4 mm, hyaline. Hindwings: length 1.1 mm, width 0.90 mm, entirely hyaline. [Legs missing]. Genitalia (Fig. 22): penes fused for most of length, each bearing a long slender spine apically; styliiger plate width 3.3 x length; forceps 3 segmented, segment 1 narrowing quite abruptly at about 0.2 x length, segments 2 and 3 short, subequal. Caudal filaments.

*Female Imago Subimago, Nymph and Egg*. Unknown.

*Comments*. This species was first described by Ulmer in 1916. The senior author was unable to collect additional specimens of *A. uncinata* but examined the



Figs. 17-26. Figs. 17-22, genitalia of ♂ imagines of: 17, *Atalomicria sexfasciata*; 18, *A. banjdlalama*; 19, *A. dalagara*; 20, *A. chessmani*; 21, *A. bifasciata*; 22, *A. uncinata*. Figs. 23-26, abdominal sternites VII and VIII of ♀ imagines of 23, *A. sexfasciata*; 24, *A. banjdlalama*; 25, *A. chessmani*; 26, *A. bifasciata*.

type specimen which is missing the legs and is now bleached so that the colour pattern is no longer apparent. The wings have been adequately illustrated by Ulmer (1916) but the genitalia were not fully illustrated by that author, and were later re-illustrated by Harker (1954). It appears that the material on which Harker's illustration was based was not the type material, and we believe that the species she illustrated was not *A. uncinata*, which has long thin spines on the penes, but one of the other species with shorter, stouter spines, so we have re-illustrated the genitalia more completely. The male imago of *A. uncinata* may be distinguished

from all other species of *Atalomicria* by the following combination of characteristics: banding absent from forewings, styliger plate breadth 3.3 x length (Fig. 22).

*Atalomicria sexfasciata* (Ulmer)

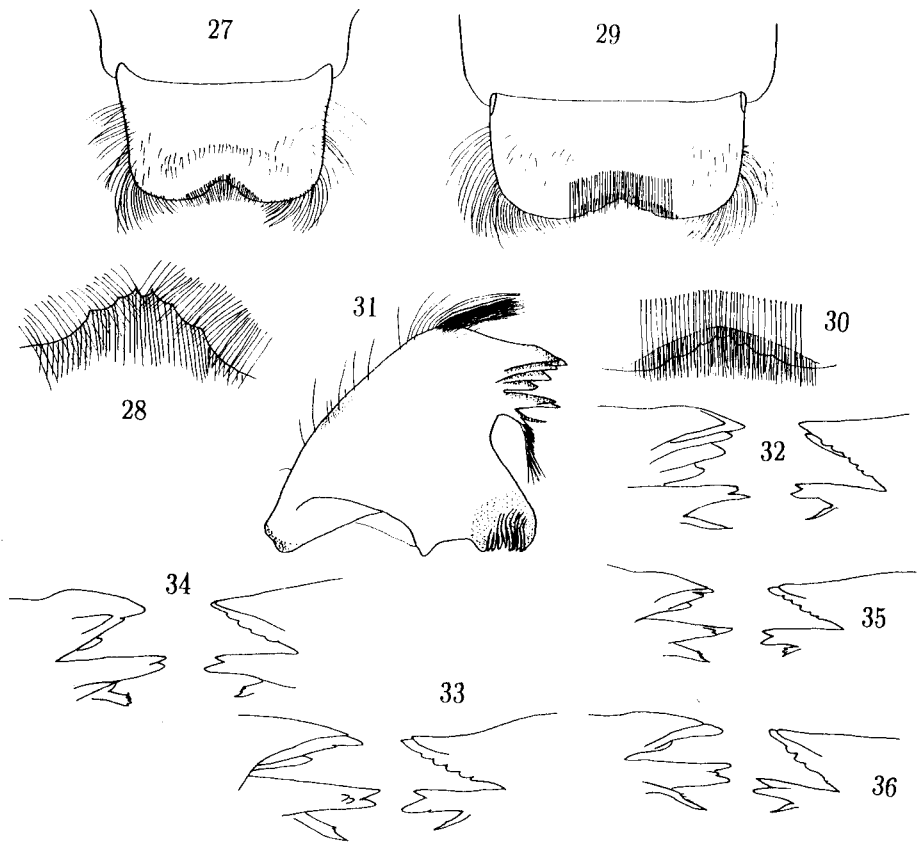
*Material Examined*: Queensland, Cedar Creek, March, holotype ♂ imago, allotype ♀ imago, coll. Dr Mjoberg's Swedish Expedition, (SMNH); North Queensland, Babinda Ck, "The Boulders", 27 IX 1987 1 ♀ sub., 1 ♀; Yuccabine Ck, Kirrama Rd, 27 IX 1987 7n, 1 ♀, 1 ♂, 2 X 1987 1 ♂, 1 ♀ sub., 9 X 1987 1 ♂. Birthday Ck, Paluma Dam Rd, 23 IX 1987, 1 ♀ imago, 3 nymphs. Adults associated with nymphs by rearing.

*Male Imago*. Eyes: upper lobe brown, diameter 1.6 x diameter of grey lower lobe, separated on meson by 0.5 x diameter. Pro- and mesonotum light brown without strong markings; sternites cream, prominent dark diagonal stripe sloping up from between the fore and midlegs to junction of pleuron with forewing. Forewings (Fig. 1): length 7.2 mm, width 2.5 mm, generally hyaline, crossveins basal to pterostigma in subcostal space surrounded by dark brown pigmented maculae, pale brown pigmented maculae associated with crossveins forming six bands across the wings. Hindwings (Fig. 2): length 1.3 mm, width 0.77 mm, entirely hyaline. Forelegs: with two dark bands, one at midlength, one distally, and a small dark patch proximally on femora; one dark band distally on tibiae, tibial length 2.9-3.1 mm, tarsal claws long, slender (Fig. 11). Abdomen (Fig. 12) virtually transparent over much of its length with pattern in black, a prominent black "saddle" shaped marking on tergite IV, tergite IX tinted brown but without black markings. Genitalia (Fig. 17): penes fused only in basal third, each bearing a long slender spine apically; styliger plate width 1.9 x length; forceps 3 segmented, segment 1 narrowing quite abruptly at about 0.3 x length, segments 2 and 3 short, subequal. Cerci and caudal filament long, subequal, brown with darker brown bands distally on each segment, more conspicuous on the distal segments.

*Female Imago*. As for ♂, except that generally larger, eyes separated on meson by 2 x diameter, forewing length 8.6 mm, width 3.0 mm, hindwing length 1.4 mm, width 0.9 mm, abdomen brown with dark central stripe on segments I-VI. Sternite VII produced posteriorly into egg guide (Fig. 23).

*Subimago*. As for imago, except wings shaded pale grey, but banding still clearly visible.

*Nymph*. General colour light brown. Mouthparts: labrum (Figs. 27, 28) width 1.5 x length. Left mandible (Fig. 31) with 5 teeth on outer incisor, paired teeth on inner incisor, prostheca (Fig. 32) well developed with a relatively large sharply pointed spine and well developed prosthecal tuft, prosthecal spine of right mandible (Fig. 39) with several small points apically. Hypopharynx as in Fig. 37. Maxillae (Fig. 38) with a row of ca 20 pectinate setae, palpi with segments 1 and



Figs. 27-36. Nymphal mouthparts. Labrum and enlarged detail of the antero-medial denticles of: 27-28, *Atalomicria sexfasciata*; 29-30, *A. banjidalama*. *A. sexfasciata*, 31, left mandible. Enlargements of the canine area of: 32, *A. sexfasciata*; 33, *A. banjidalama*; 34, *A. dalagara*; 35, *A. chessmani*; 36, *A. bifasciata*.

2 subequal in length, segment 1 a little longer than width of head, segment 3 length *ca* 0.15 x segment 2. Labium (Figs. 39, 40) with ratios of segment lengths of palpi 1.9: 1.6: 1. Pronotum with two short spines on anterior corners. Legs (Fig. 43) with broad spines on posterior margin of femur, two dark bands across femur, one distally on tibia, claws (Fig. 44) long and slender. Gills (Fig. 50) on segments I-VII with central trachea conspicuous but lateral tracheae pale and inconspicuous. Abdomen with posterolateral spines on segments VIII-IX, dorsal pattern (Fig. 55) restricted to segments IV and VIII, cerci and terminal filament with dark bands *ca* 0.3 x length of each segment on each segment basally, becoming increasingly separated distally, whorls of short hair at posterior margin of each segment.



*Egg.* Size 150µm x 75 µm, chorion with large tubercles (Fig. 60), adhesion structures grouped in twos or threes, more or less arranged in longitudinal rows, one or more funnellform micropyles near equator of egg.

*Comments.* This species may be separated from all other species of *Atalomicria* by the following combination of characters: in the imago, six conspicuous coloured bands across the forewings (Fig. 1); in the nymph, pattern on the abdomen restricted to segments IV and VIII (Fig. 55).

*Atalomicria banjdlalama* sp. n.

*Material Examined.* Holotype ♂ imago (genitalia on slide AM01), allotype ♀ imago, both reared in December 1989 from material collected at Booloumba Creek, Conondale Ranges Qld, 29 XI 1989, paratypes 7 nymphs, collection details as above.

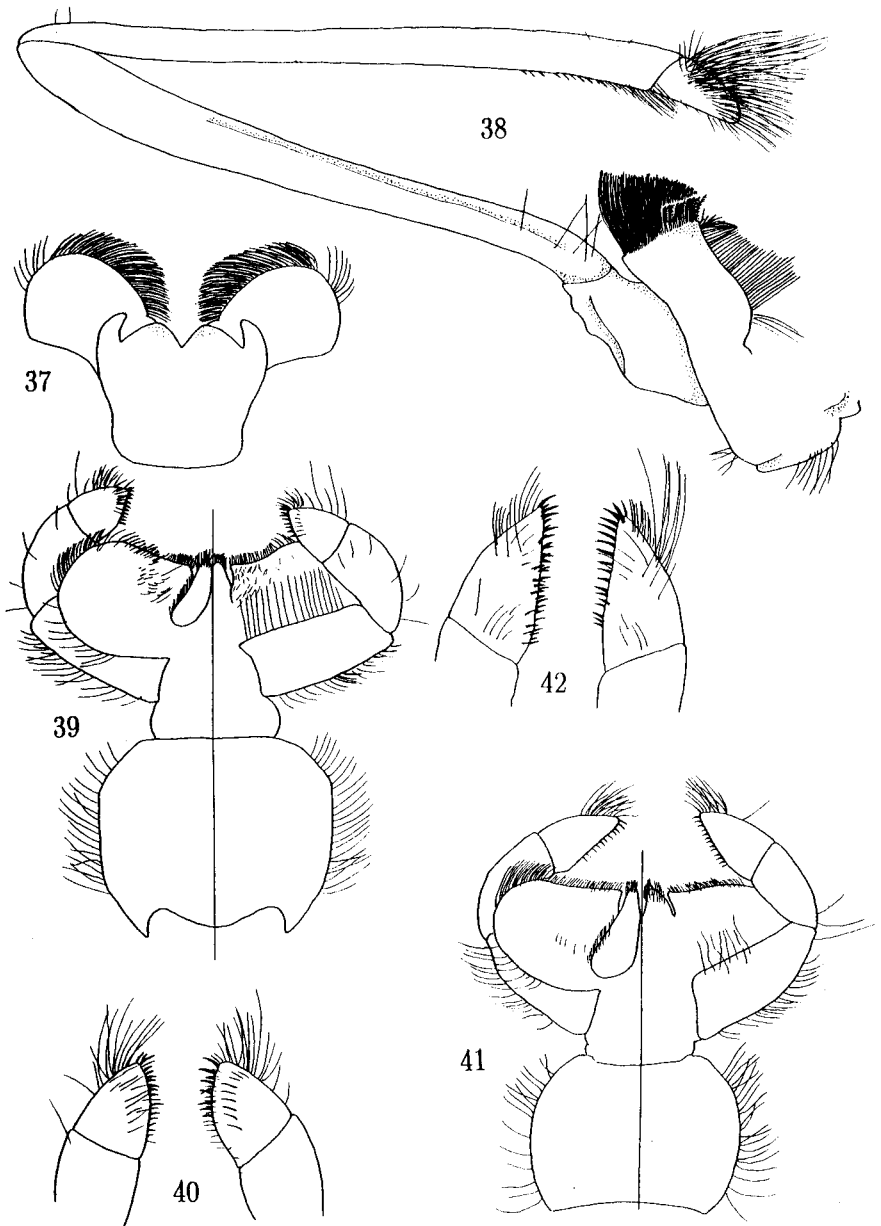
*Male Imago.* Eyes: with upper lobes brown, diameter 1.3 x diameter of grey lower lobes. Lobes separated dorsally by 0.5 x width. Pro- and mesonotum light brown with dark brown and black markings; sternite brown to cream with darker markings. Forewings (Fig. 3): length 10.3 mm, width 3.7 mm, hyaline, slight brown shading in costal and subcostal areas, more intense in pterostigma, very faint shading around some crossveins in anterior basal area of wings, but banding absent. Hindwings (Fig. 4): length 2.2 mm, width 1.3 mm, entirely hyaline. Forelegs cream with 3 striking dark brown bands distally, proximally and near midpoint of femora, one distally on tibiae, length of tibiae 4.3-4.4 mm. Abdomen (Fig. 13) cream with dark brown to black pattern dorsally. Genitalia (Fig. 18) penes not strongly separated, bearing a single sharp hooked spine distally, styliger plate width 2.5 x length, forceps 3 segmented, basal segment long, tapering gradually, segments 2 and 3 short. Cerci and terminal filament long with prominent narrow dark bands.

*Female Imago.* As for ♂, except eyes grey, separated by 3.8 x diameter. Thorax darker than in ♂, forewing length 10.8 mm, width 3.8 mm; hindwing length 1.9 mm, width 1.1 mm. Abdomen with dorsal pattern darker, sternite VII produced to form an egg guide (Fig. 24).

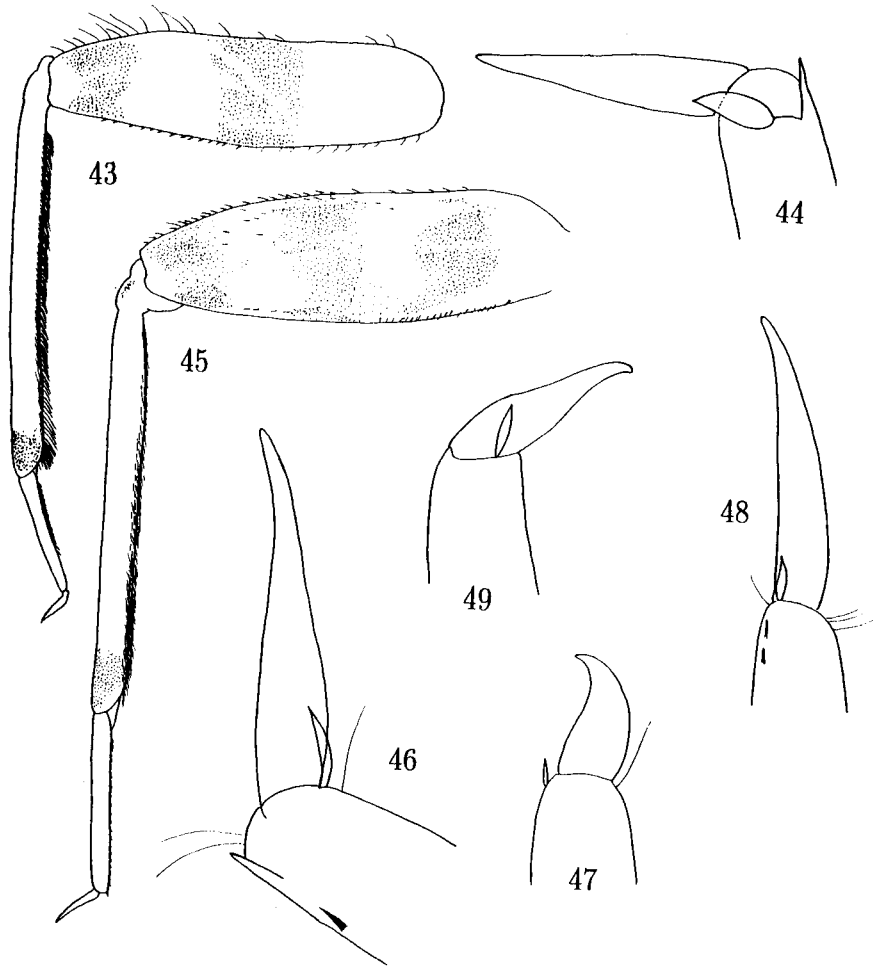
*Subimago.* Unknown.

*Etymology:* from "banjdlalam" meaning "winged insect" in the language of the Gidabal people of southeastern Queensland.

*Comments.* This species may be distinguished from all other species of *Atalomicria* by the following combination of characters: in the imago, forewings (Fig. 3) lack coloured bands, penes in male (Fig. 18) each bears a short stout curved spine distally, dorsal abdominal pattern (Fig. 13) extensive on all segments; in the nymph, gill lamellae grey with conspicuous dark lateral tracheation



Figs. 37-42. Nymphal mouthparts. *Atalomicria sexfasciata*, 37, hypopharynx and 38, maxilla. Dorsal (left) and ventral (right) views of labium and enlargements of segment 3 of the labial palpi of : 39-40, *A. sexfasciata*; 41-42, *A. banjidalama*.



Figs. 43-49. Nymphal forelegs and tarsal claws of : 43-44, *Atalomicria sexfasciata*; 45-46, *A. banjidalama*. Tarsal claws of forelegs of : 47, *A. dalagara*; 48, *A. chessmani*; 49, *A. bifasciata*.

(Fig. 51), prosthecal spine on right mandible (Fig. 33) serrated and sharp, abdomen (Fig. 56) brown dorsally strongly patterned in black.

*Atalomicria dalagara* sp. n.

*Material Examined.* Holotype ♂ imago (genitalia on slide AM05) reared in December 1989 from material collected at Booloumba Creek, Conondale Ranges Qld, 29 XI 1989, paratypes 2 nymphs, collection details as above.

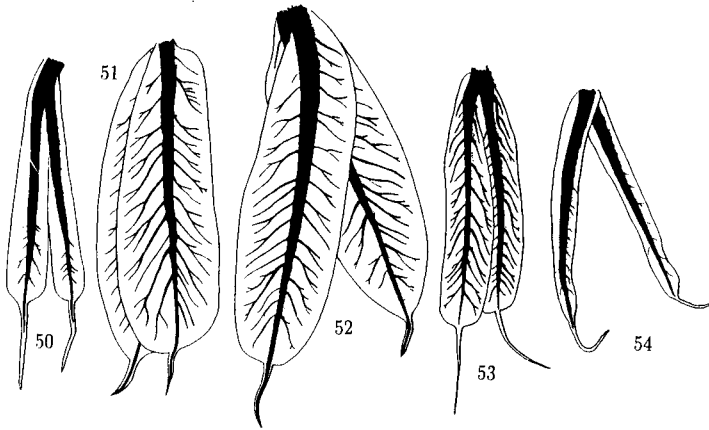
*Male Imago.* Eyes: with upper lobes brown, diameter 1.3 x diameter of grey lower lobes. Pro- and mesonotum light brown with dark brown and black markings, central area of mesonotum mid-brown, dark diagonal stripe across base of forelegs, and dark markings on pleurites forming a diagonal darker area, but not a large distinct stripe; sternite brown to cream with dark transverse stripe anteriorly and mid-brown region posteriorly. Forewings (Fig. 5) length 10.5 mm, width 3.3 mm, hyaline, slight brown shading in costal and subcostal areas, more intense in pterostigma, extremely faint shading around same crossveins in basal area of wing that are shaded to form bands in *A. bifasciata*; hindwings (Fig. 6) length 2.1 mm, width 1.3 mm, entirely hyaline. [Forelegs missing in type.] Abdomen (Fig. 14) semi-transparent cream with dark brown to black pattern dorsally. Genitalia (Fig. 19) penes fused, each bearing a single sharp hooked spine distally, which projects horizontally from penes preserved material but not in slide mounted material, styliiger plate width 3 x length, cerci and terminal filament with prominent dark narrow bands.

*Female Imago, Subimago.* Unknown.

*Nymph.* General colour mid-brown with conspicuous dark markings. Mouthparts: labrum width 2 x length. Left mandible with 3-4 teeth on outer incisor, paired teeth on inner incisor, protheca well developed with a relatively large tridentate spine (Fig. 34) and well developed prosthecal tuft; prosthecal spine of right mandible (Fig. 34) with several small points subapically. Maxillae with a row of *ca* 10 pectinate setae, palpi segment 1 a little longer than width of head, segment 3 length *ca* 0.15 x segment 2. Labium with ratios of segment lengths of palpi 2: 1.2: 1. Pronotum with one stout short spine and several smaller spines on anterior corners. Legs with scattered spines on femur, three dark bands across femora, one distally on tibiae, claws short, curved (Fig. 47.) Gills (Fig. 52) narrow but broadening distally before narrowing to a thin filament distally, tracheae dark and conspicuous, lamellae pigmented brown. Abdomen with posterolateral spines on segments VIII-IX, dorsal pattern (Fig. 57) with conspicuous lateral longitudinal stripes, terminal filament slightly longer than cerci, all three uniform brown.

*Etymology:* from "dalagar", the word for "mud" in the language of the Gidabal people of southeastern Queensland, in reference to the apparent association of the species with silty habitats.

*Comments.* This species may be distinguished from all other species of *Atalomicria* by the following combination of characters: in the male imago, wings without coloured bands, penes with short stout spines apically, abdomen largely transparent, lightly patterned; in the nymph, tarsal claws relatively short and hooked, gills brown, dorsal abdominal pattern with two longitudinal lateral stripes.



Figs. 50-54. Abdominal gills of : 50, *Atalomicria sexfasciata*; 51, *A. banjidalama*; 52, *A. dalagara*; 53, *A. chessmani*; 54, *A. bifasciata*.

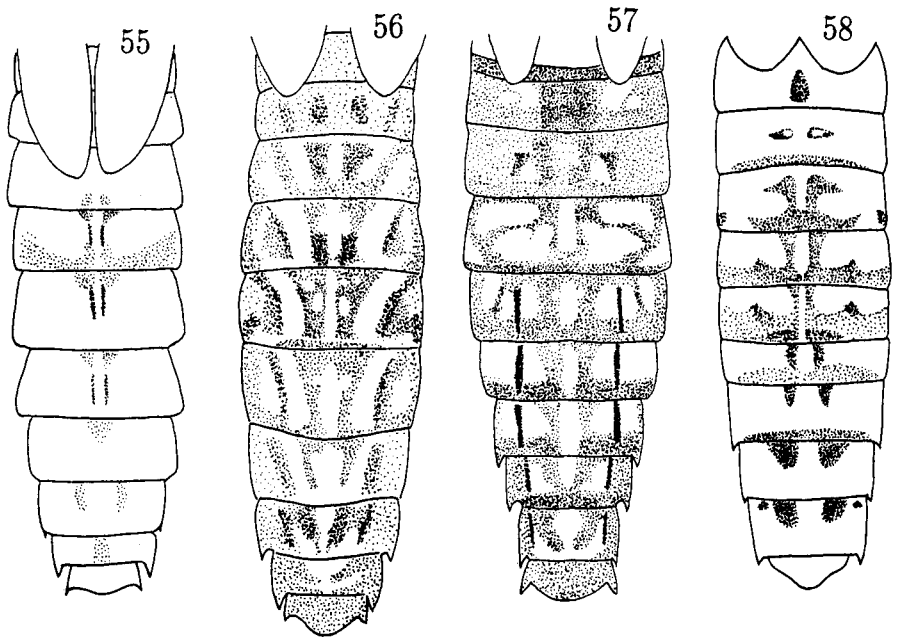
*Atalomicria chessmani* sp. n.

*Material Examined.* Holotype ♂ imago, paratype ♂ imago, allotype ♀ imago, 2 paratype ♀ imagines reared from material collected October 1987 Ferntree Ck at Sardine Ck Track, 10 km south of Goongerah, Victoria; 2 ♂ imagines collected and reared November 1987; 10 nymphs 18 I 1990 all from type locality.

*Male Imago.* Eyes, upper lobe brown, diameter 1.4 x diameter of grey lower lobe, separated on meson by 2 x diameter. Pronotum brown with 2 broad black longitudinal stripes laterally, and a narrow stripe on the midline, mesonotum with raised central region mid-brown, darker brown markings lateral to this. Forewings (Fig. 7): length 11.4 mm, width 9.0 mm, hyaline except for costal and subcostal spaces slightly shaded with brown, colour more pronounced in pterostigmal area, crossveins in costal and subcostal spaces shaded with dark brown, but cross veins elsewhere not shaded, banding absent. Hindwings (Fig. 8) hyaline. Forelegs tibial length 4.0-4.5 mm, femora mid-brown with two indistinct darker bands. Abdomen semi-transparent with prominent dark brown pattern (Fig. 15). Genitalia (Fig. 20) similar to *A. banjidalama* but penes more deeply bifid and spines shorter and less curved, styliger plate width 5.5 x length. Caudal filaments subequal, light brown banded in very dark brown, each band half a segment length basally extending to 1.5 x segment length distally.

*Female Imago.* As for ♂, except eyes separated on meson by 3.25 x diameter, forewing length 12.25 mm, width 5.7 mm. Abdominal sternite VII (Fig. 25) produced to form egg guide.

*Nymph.* (Fig. 59). General colour grey. Mouthparts: labrum width 2 x length.



Figs. 55-58. Patterns on nymphal abdominal tergites for: 55, *Atalomicria sexfasciata*; 56, *A. banjdlalama*; 57, *A. dalagara*; 58, *A. bifasciata*.

Left mandible with 4 teeth on outer incisor (Fig. 35), paired teeth on inner incisor, prosthema well developed with a relatively large apically serrated spine distally and well developed prosthecal tuft; prosthecal spine of right mandible (Fig. 35) with three prominent teeth apically. Maxillae with a row of *ca* 8-10 pectinate setae, palpi with segment 1 *ca* 1.2 x headwidth, segment 3 length *ca* 0.15 x segment 2. Labium with segments 2 and 3 of palpi subequal length, segment 1 *ca* 1.9 x length segment 2, segment 3 as in Fig. 59. Pronotum with several short spines on anterior corners. Legs with sparse spines on femora, absent from proximal third, three dark bands across femora, one distally and a small patch proximally on tibiae, claws long and fairly straight (Fig. 48). Gills (Fig. 53) broad and subparallel basally, narrowing to a thin filament distally, tracheation dark and abundant. Abdomen with conspicuous pattern dorsally (Fig. 59); terminal filament and cerci with whorls of short hair at posterior margin of each segment.

*Egg.* Size 180 $\mu$ m x 90 $\mu$ m, chorion with numerous rounded tubercles (Fig. 61), adhesion structures singly, more or less evenly dispersed over the surface, micropyle equatorial, surrounded by a raised rim.

*Etymology.* This species is named for Dr Bruce Chessman of the Sydney Water Board, who first collected it and drew it to our attention.

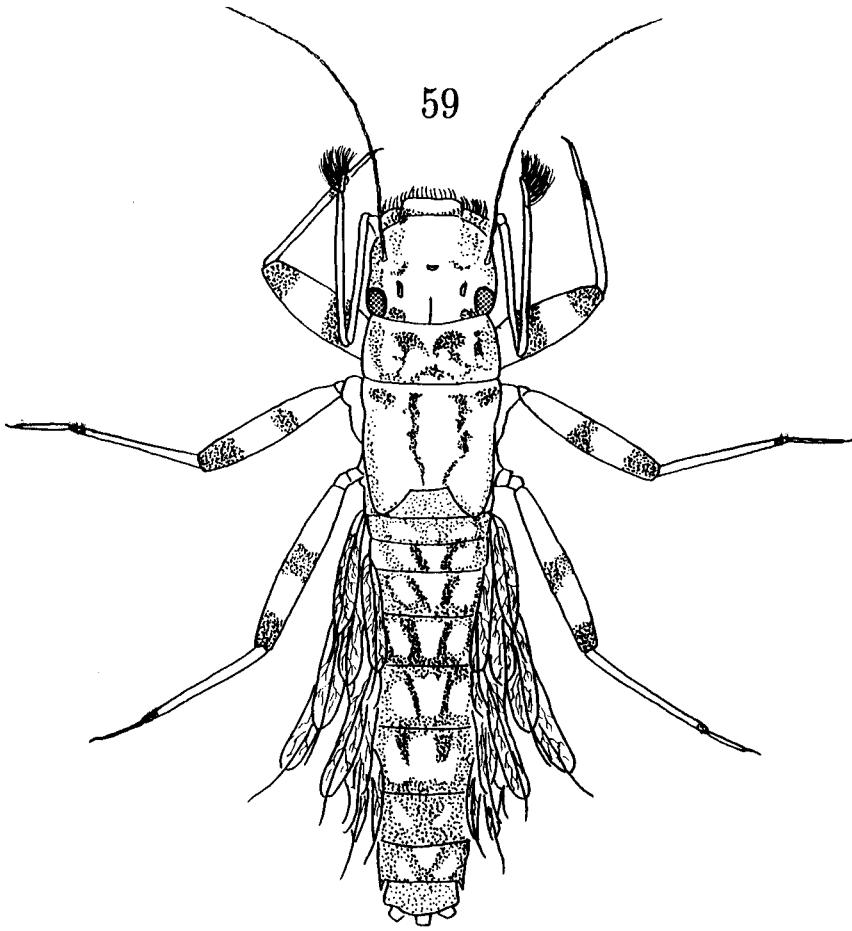


Fig. 59. Nymph of *Atalomicria chessmani*.

*Comments.* The species can be distinguished from all other species of *Atalomicria* by the following combination of characters: in the imagines, forewings lacking coloured bands, penes in male each bearing a short stout curved spine distally, dorsal abdominal pattern with two pale lateral patches on segment IX; in the nymph, broad gills with prominent dark lateral tracheae, abdominal tergite X pale.

*Atalomicria bifasciata* sp. n.

*Material Examined.* Holotype ♀ imago, allotype ♂ imago, Booloumba Ck, Conondale Ranges, Qld, 5 XII 1989, paratypes, 1 ♂ subimago, 2 nymphs 5 XII 1989.

*Male Imago.* Eyes: upper lobe brown, diameter 1.4 x diameter of grey lower lobe, separated on meson by 0.5 x diameter. Pronotum honey brown with mid-brown patches laterally, mesonotum mid-brown with a pale medial stripe; sternite cream anteriorly, midbrown posteriorly. Pleura with dark diagonal stripe as in *A. sexfasciata*, with stripes from either side joining across the sternite. Forewings (Fig. 9): length 8.3 mm, width 3.0 mm, hyaline except tinged yellow brown in costal and subcostal areas, costal cross veins basal to pterostigma variable in number (3-5) and all surrounded by very dark pigmented maculae. Golden brown pigmented areas fringing crossveins in basal third of wings forming two stripes across wings. Hindwings (Fig. 10): length 1.8 mm, width 1.1 mm, entirely hyaline. Forelegs tibial length 3.1 mm, femora mid-brown, slightly darker about midlength but without conspicuous bands. Abdomen (Fig. 16) transparent with narrow black ring at posterior margin of each tergite, an indistinct black smudge laterally on tergites IV and V. tergites VIII and IX with large dark areas. Genitalia (Fig. 21) penes shallowly bifid with short curved apical spines, styliger plate width 1.7 x length, with two prominent bumps either side of a shallow central invagination, forceps 3 segmented with segment 1 narrowing more or less abruptly at *ca* 0.5 x length. [caudal filaments missing from type].

*Female Imago.* As for ♂ except, eyes separated on meson by 3.4 x diameter, forewing length 8.4 mm, width 3.0 mm. Abdominal sternite VII (Fig. 26) produced to form egg guide.

*Subimago.* As for imago but colour light grey. Wing pattern identical but wings grey with darker grey pattern.

*Nymph.* General colour cream to brown. Mouthparts: labrum width 2.3 x length. Left mandible with a curved row of hair on ventral surface, 4 teeth on outer incisor (Fig. 36), paired teeth on inner incisor, prostheca well developed with a relatively large spine with prominent teeth on the outer side, prosthecal spine of right mandible (Fig. 36) sharp with several minute serrations on the outer side. Maxillae with a row of *ca* 7-8 pectinate setae, palpi with segment 1 *ca* 1.2 x headwidth, segment 3 length *ca* 0.15 x segment 2. Labial palps with segments 2 and 3 subequal length, segment 1 *ca* 2.2 x length segment 2. Pronotum with several short spines on anterior corners. Legs with rows of spines on posterior and anterior margins of femora, absent from proximal third, three dark bands across femora, one distally and a small patch proximally on tibiae, claws slender, hooked (Fig. 49). Gills (Fig. 54) present on segments I-VII, narrow, reducing in width distally before narrowing to a thin filament, lateral tracheation inconspicuous. Abdomen with posterolateral spines on segments VIII-IX, conspicuous pattern dorsally (Fig. 58). Terminal filaments subequal with pattern of narrow bands.

*Etymology.* *bi-*, L., meaning two; *fascia*, L., meaning band; named for the two conspicuous coloured bands on the forewings.



*Comments.* This species can be distinguished from all other species of *Atalomicria* by the following combination of characters. In the imago: forewings (Fig. 9) with two transverse pigmented bands in basal half, penes in ♂ (Fig. 21) with short curved spines distally, styliger plate width 1.7 x length. In the nymph: dorsal abdominal pattern (Fig. 58) present on all segments with pale median stripe, gills (Fig. 54) narrow with lateral tracheation inconspicuous.

### KEY TO THE SPECIES OF *ATALOMICRIA*

#### Key to Male Imagines

1. Forewings with conspicuous banding (Figs. 1, 9) ..... 2.
- Forewings not banded (Figs. 3, 5, 7) ..... 3.
2. Wings with six bands (Fig. 1) ..... *A. sexfasciata*
- Wings with two bands (Fig. 9) ..... *A. bifasciata*
3. Forceps narrow abruptly (Fig. 22) ..... *A. uncinata*
- Forceps narrow gradually (Figs. 18, 20) ..... 4.
4. Spines on penes extend in plane of penes (Fig. 20) ..... *A. chessmani*
- Spines on penes hooked vertically (Figs. 18, 19) ..... 5.
5. Dorsal abdominal pattern extends throughout each tergite (Fig. 13) ..... *A. banjdzalama*
- Dorsal abdominal pattern restricted to "lyre" shaped markings on segments III-VII (Fig. 14) ..... *A. dalagara*

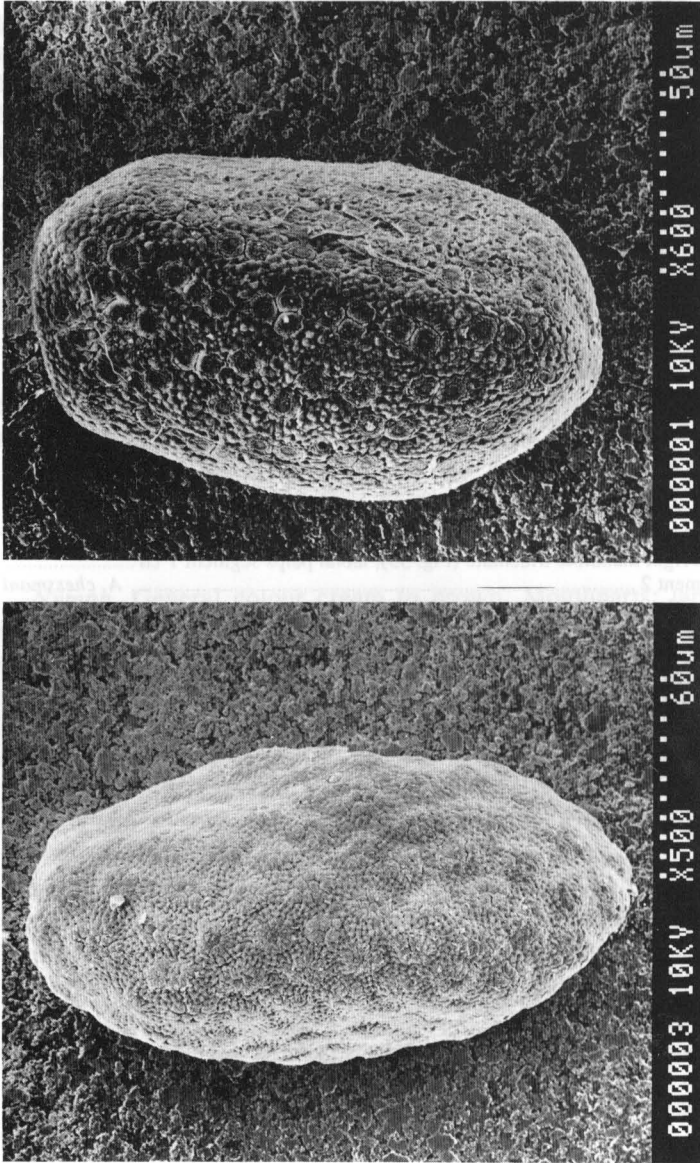
#### Key to Mature Nymphs

1. Gills with conspicuous lateral tracheae (Figs. 51-53) ..... 3.
- Gills without conspicuous lateral tracheae (Figs. 50, 54) ..... 2.
2. Conspicuous dark pattern on all abdominal tergites (Fig. 58) ..... *A. bifasciata*
- Dark pattern absent on tergites IV-VI (Fig. 55) ..... *A. sexfasciata*
3. Tarsal claws of forelegs short and curved (Fig. 47) ..... *A. dalagara*
- Tarsal claws of forelegs long, relatively straight (Figs. 46, 48) ..... 4.
4. Prosthecal spine on right mandible tridentate (Fig. 35), labial palps segment 1 *ca* ..... 1.9 x length of segment 2 ..... *A. chessmani*
- Prosthecal spine on right mandible spinose (Fig. 33), labial palps segment 1 *ca* ..... 1.2 x length of segment 2 ..... *A. banjdzalama*

Note that the key to the male imagines does not include *A. yugana* for which the male imago is unknown. If the pattern on the wings in the imago is the same as in the subimago it would key out to *A. bifasciata*, and may be separated by size as *A. yugana* appears to be significantly larger (forewing length 14 mm) than *A. bifasciata* (forewing length 8.3 mm). The nymphal key does not include *A. uncinata*, for which the nymph is unknown or *A. yugana* for which Harker's description is inadequate to include it.

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Figs. 60-61. Scanning electron micrographs of the eggs of: 60, *A. sexfasciata* (left); 61, *A. chessmani* (right).

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