

SOME NEW AUSTRALIAN EPHEMEROPTERA.

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PART I.

1. INTRODUCTION.

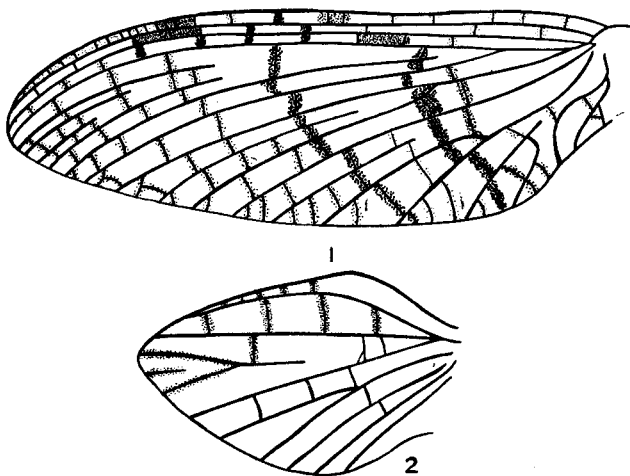
IN the present paper the method of description follows that of previous papers (Harker 1950, 1954). Body length has been measured from the anterior edge of the clypeus to the base of the caudal filaments. Measurements of nymphs have all been made on the penultimate instar animals. Specimens have been collected by the author unless otherwise stated.

The types will be deposited in the British Museum (Natural History).

2. LEPTOPHLEBIIDAE.

Atalophlebia yugana sp. n. 1-10

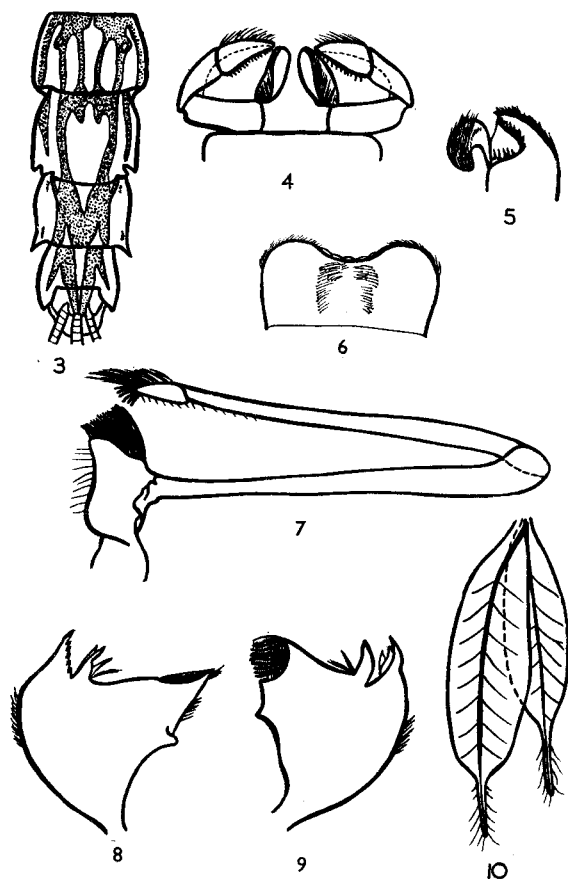
Female subimago—Measurements: Fore wing 14 mm. Hind wing 3.2 mm. Body length 14 mm. General colour: Creamy-yellow with very distinct dark brown markings. Wings: Veins dull brown, all cross-veins shaded with greyish-brown. Costal and subcostal areas of fore wing distinctly yellow. In the fore wing (fig. 1) *Rs* forks close to the base, and the long



FIGS. 1-2.—*Atalophlebia yugana* sp. n. Subimago: (1) Fore wing. (2) Hind wing.

intercalary $1R_{3b}$ arises close to the fork. *MA* arises at about the same level as $1R_{3b}$. *1MA* long, running almost to fork of *MA*. *MP* arises slightly basad to fork of *MA* and slants sharply towards *CuA* at its origin, but curves away as it runs towards the wing margin. Marginal two-thirds of *CuP* very strongly curved. Hind wing (fig. 2): costal space long and very narrow at the apical end, a number of cross-veins present. *Rs* arises just beyond half the distance from base to apex. Fork of *MP* slightly basad to origin of *Rs*. No inter-

calary present in *MP*. *Legs* : Yellow with one faint stripe near proximal end of femur and two very dark stripes at distal end ; one stripe present at distal end of tibia, and distal end of each segment of the tarsus is slightly shaded. Legs very long and noticeable with their distinct markings. Fore leg : femur 2.4 mm., tibia 4.0 mm., tarsus 2.0 mm. Tarsal segments in order of decreasing length : 2, 3, 5, 4, 1 (fused with tibia). Mid leg : femur 4 mm., tibia 4.5 mm., tarsus 1.5 mm. Hind leg : femur 4.0 mm., tibia 4.5 mm., tarsus



FIGS. 3-10.—*Atalophlebia yugana* sp. n. Nymph : (3) Abdomen. (4) Labium. (5) Glossa and paraglossa. (6) Labrum. (7) Maxilla. (8) Right mandible. (9) Left mandible. (10) Gill.

1.0 mm. Tarsal segments in order of decreasing length : 2, 5, 3, 4, 1 (fused with tibia). Tarsal claws all acute. *Abdomen* : With very clear dark brown markings, segments 10 and 7 noticeably lighter in colour. Lateral angles of segment 9 produced into short spines. Subanal plate deeply concave. Appendix dorsalis present, shorter than caudal filaments, all three distinctly striped with brown.

Nymph.—Measurements : Body length 14 mm. *General colour* : Yellow with very distinct brown to black markings (fig. 3). *Head* : Very nearly square in outline. Antennae very long (9 mm.). Eyes widely separated in male nymph in the last instars, but clearly divided into a black lower and a brown upper portion. *Mouth parts* unusual, particularly the maxillae, which (fig. 7) bear long palps projecting well anterior to the head even when the

joints are bent at rest. (At first sight these palps look not unlike an extra pair of legs, and when the nymph is feeding they are stretched out over the detritus on the stream bed and sweep particles into the mouth.) In a nymph with the head 2.2 mm. long, length of maxillary palp is 10 mm., the proximal two segments being equal in length and the distal one very small. Mandibles (figs. 8-9) well developed and each bears two groups of canines and a well-developed molar process. Labrum (fig. 6) deeply concave on its anterior edge and bears six denticular plates. Labium (fig. 4) with a 3-segmented palp, the distal segment narrowing considerably at the tip and bearing spines and hairs. Paraglossae large, and on inner border completely recurved so that the thick brush of hairs lies adjacent to the thick hairs on the small overlying glossae. (In fig. 5 the paraglossa has been separated from the glossa to show the inner border of the former. The tips of the maxillary palps are drawn through the brushes on the labium when the nymph is feeding.) *Legs*: Very long (hind leg 8.4 mm.); held under the body so that the nymph stands well up from the bed of the stream. Tibia and femur of all legs about equal in length, being three times the length of the tarsi. Tarsal claws quite smooth. Legs yellow in colour with three dark stripes on femur, two on tibia and one on tarsus. *Gills* (fig. 10): Very long (second gill 6 mm.), held nearly vertical above the body in life; they are double, broadly lanceolate, with a drawn-out tip, and are present on segments 1-7. *Abdomen*: Lateral angles of abdomen produced into spines (fig. 3). Caudal filaments spread wide apart and held well out from the body. Appendix dorsalis well developed and as long as caudal filaments. Dark brown annulations on all three.

Male imago, female imago.—Unknown.

Holotype female subimago, NEW SOUTH WALES: Kuringae Chase, Sydney, viii. 1955. In alcohol. Morphotype nymph and paratypes, same locality.

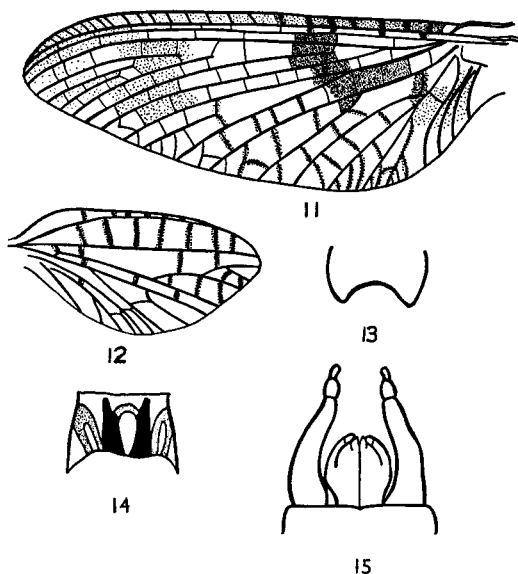
This species is quite distinct and easily separated from any other known Australian species. In the key to this genus (Harker, 1954) it runs to section 7 and can be separated from the following species by the extreme length of the legs. The nymph is immediately distinguishable from those of other species by the elongated maxillary palp.

Atalophlebia darrunga sp. n.

Male subimago.—*Measurements*: Body length 11 mm. Fore wing 11 mm. Hind wing 3 mm. *General colour*: Reddish-brown with dark brown markings. Upper region of eyes bright orange, the lower black. *Wings*: Veins red-brown, all the cross-veins suffused with smoky-grey, as is also the membrane in the regions shown in fig. 11. Cross veins in basal half of costal and subcostal areas very distinct. Fore wing: *Rs* forks close to base of wing, and the long intercalary *IR_{3b}* arises close to the fork. Fork of *MA* also arises in basal half of wing, very slightly basad to *IR_{3b}*. *IMA* short. *MP₂* arises close to the base and slants sharply towards *CuA* at its origin, curving away again as it runs towards the wing margin. *CuP* distinctly sigmoid. Hind wing (fig. 12): costal space long and very narrow with a number of cross-veins. *Rs* arises in apical half of wing. *MP* forked at slightly less than half the distance from base to apex, an intercalary present in the fork. *Legs*: Yellow-brown with two dark bands on femur and tibia. Tarsi all dark brown except for distal segment. Femur slightly shorter than tibia in mid and hind legs, and tarsus about half length of femur. In the fore leg the tibia and femur equal in length, and shorter than tarsus. Tarsal segments in order of decreasing length: fore leg 2, 3, 4, 5, 1 (fused with tibia), hind leg 5, 2, 3, 4, 1 (fused with tibia). Tarsal claws all acute. *Abdomen*: Light reddish-brown with a distinctive dark brown pattern (fig. 14) of which the clearest feature is a row of two almost parallel lines in the mid-dorsal region. Appendix dorsalis present, slightly shorter than caudal filaments. *Genitalia* (fig. 15): Not unlike *A. albiterminata* in general shape. Incision between the two halves of penis much deeper. Two processes

present on the median line, but these differ in shape from the heart-shaped processes in *A. albiterminata*. Penis reaches well beyond the narrowing of the first segment of forceps.

Female imago.—*Measurements*: Fore wing 14 mm. Hind wing 4 mm. *General colour*: Dark brown with black markings. *Wings*: Veins dark brown, cross-veins in costal and subcostal areas very dark and thick. One black spot over the bulla in the subcostal area. Pterostigmal area shaded brown. *Legs*: Fore leg femur slightly shorter than tibia; in the hind legs femur and tibia equal in length. Tarsus slightly more than half length of tibia. Tarsal segments in order of decreasing length: 5, 1 (fused with tibia), 2 = 3 = 4. Tarsal claws all acute. *Abdomen*: Subanal plate with a deep incision (fig. 13). Appendix dorsalis present, slightly shorter than caudal filaments, and much thinner; all three clearly annulated with dark brown.



FIGS. 11-15.—*Atalophlebia darrunga* sp. n. Subimago: (11) Fore wing. (12) Hind wing. (13) Subanal plate. (14) Abdominal pattern. (15) Genitalia.

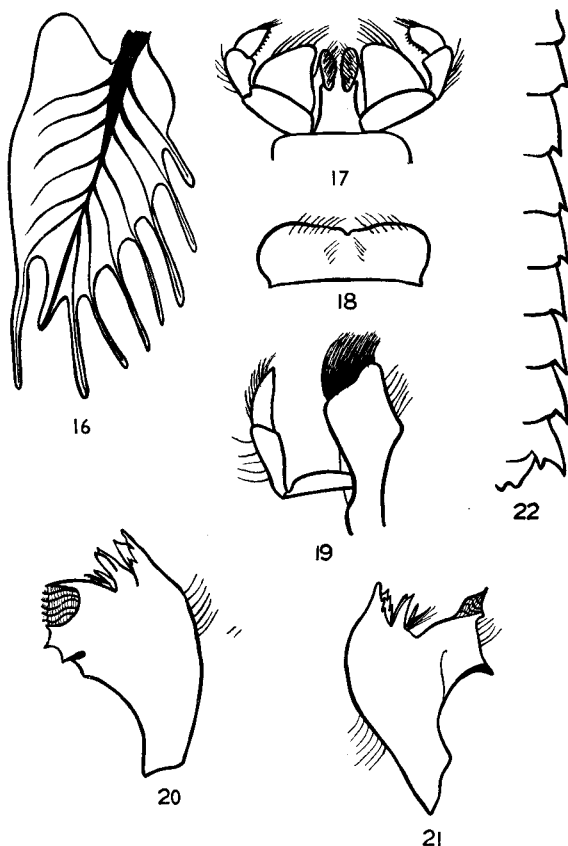
Female subimago.—*Measurements*: Fore wing 12 mm. Hind wing 3.2 mm. Otherwise as imago, and wings as male subimago.

Nymph.—*Measurements*: Body length 14 mm. *General colour*: Yellowish-brown with dark brown markings. *Head*: Antennae long. Eyes wide apart, even in the male. *Mouth parts* (figs. 17-21): Like *A. albiterminata* in most details. Mandibles well developed with two groups of canines on each, but not divided into three teeth as in *A. albiterminata*, and with large molar processes. Maxillae with 3-segmented palp, the distal segment being the shortest and tapering to a point, the second segment slightly longer than the proximal one. Labium with a 3-segmented palp, the distal two segments being about equal in length and shorter than the proximal one. Shape of submentum differs from that of *A. albiterminata*. Anterior edge of labrum slightly concave and fairly smooth, the concavity much shallower than that of *A. albiterminata*. *Legs*: Of medium length (hind leg 5 mm.). Femur in all legs with three dark bands, tibia with two and tarsus with one. *Abdomen*: Lateral edges of abdominal segments prolonged into spines (fig. 12). Caudal filaments ringed with dark brown. *Gills* (fig. 16): Double and multidigitate, but with the outer edge undivided in

the dorsal lamellae, the ventral one with two or three digits on the outer edge. Gills present on segments 1-7.

Holotype male subimago, NEW SOUTH WALES: Coal and Candle Cr., Sydney, 17.viii.1955. Allotypes and morphotype, same locality. Paratypes, N.S.W.: Epping, viii.1955; Armidale, viii.1955.

This species is close to *A. albiterminata*, but can be distinguished by a number of features. The wing pattern in the subimago is not as clearly defined in the



FIGS. 16-22.—*Atalophlebia darrunga* sp. n. Nymph: (16) Gill. (17) Labium. (18) Labrum. (19) Maxilla. (20) Left mandible. (21) Right mandible. (22) Outline of abdominal angles.

posterior half of the wing, the fork of *MA* in the fore wing is basal to the beginning of *IR*_{3b} (not apical as in *A. albiterminata*), *MP* of the hind wing is forked, and the shape of the penis is different, as are the abdominal markings of the nymph, the form of the spines on the abdomen, and the mouth parts.

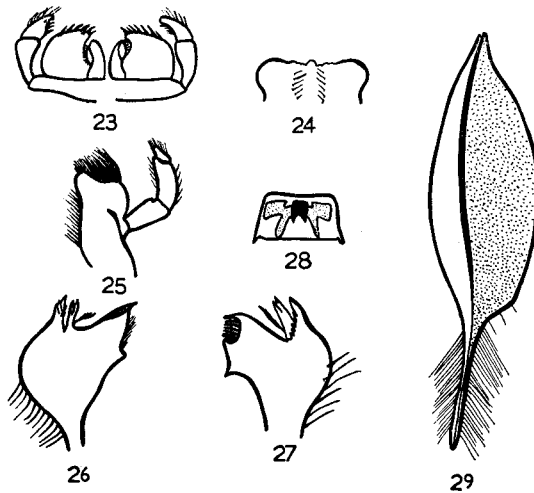
In the key to *Atalophlebia* (Harker, 1954) this species would come in section 13. It can be separated from *A. incerta* as follows:

Penis narrows at the base	<i>A. darrunga</i>
Penis narrows at two-thirds of distance from base to tip	<i>A. incerta</i>

Atalophlebia pierda Harker.

The nymph of this species was previously unknown.

Nymph.—*Measurements* : Body length 9 mm. *General colour* : Yellow with pale brown markings. *Mouth parts* (figs. 23–27) : Mandibular canines well developed with many teeth. *Maxilla* with 3-segmented palp, the basal two segments broad and elongated slightly at the distal end of the inner surface, the distal segment very short and narrowing at its free end. *Labium* with well developed paraglossae slightly concave on the inner surface and bearing well developed spines on the anterior edge. Glossae small with numerous spines. *Labial palp* 3-segmented, basal segment long and fairly stout, the second segment broadening considerably at the distal end, the distal segment narrowing at its free end. *Labium* with



FIGS. 23–29.—*Atalophlebia pierda* Harker. Nymph: (23) Labium. (24) Labrum. (25) Maxilla. (26) Right mandible. (27) Left mandible. (28) Abdominal pattern. (29) Gill.

a convex protuberance on its anterior margin. *Legs* : Hind leg considerably longer than other legs. Tarsus about one-quarter length of tibia, which is slightly shorter than femur. Tarsal claws short and heavily denticulate. *Abdomen* : Lateral edges of abdominal segments all with small backwardly projecting spines, that on segment 9 much longer than the others. Caudal filaments and appendix dorsalis equal in length. *Gills* : Seven pairs, all double (fig. 29), very long, each one being equal to about six abdominal segments. Each lamella broad with a long tip bearing many fine hairs.

Holotype, NEW SOUTH WALES : Kuringae Chase, Sydney, 27.viii.1955.

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