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ENTOMOLOGY OF THE AUCKLANDS AND OTHER ISLANDS SOUTH OF NEW ZEALAND: EPHEMEROPTERA: LEPTOPHLEBIIDAE[1]

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Abstract: A new species, *Atalophlebioides aucklandensis*, is described from the Auckland Islands. The species is known from the male and female imagos and nymphs. This is the first record of Ephemeroptera from the subantarctic islands south of New Zealand.

Among specimens collected by Dr J. L. Gressitt and Mr K. A. J. Wise on the Auckland Islands are imagos and nymphs of a new species of *Atalophlebioides*. This is the first record of Ephemeroptera from the subantarctic islands south of New Zealand and southeast of Australia and Tasmania.

The following terms and procedures used in the descriptions of the imagos and nymphs require further explanation. Venational terminology used is as given in Peters and Edmunds (1964). Each segment of the fore legs of the male imagos is compared to the length of the fore tibiae and expressed as a ratio, while the average length in millimeters of the fore tibiae is given in parentheses. In the figure of the labium, the ventral surface is shown on the right hand side of the drawing, and dorsal surface is shown on the left.

I offer my sincere thanks to Dr Gressitt for the opportunity to study the material and to Mrs William L. Peters for preparation of the illustrations.

Atalophlebioides aucklandensis Peters, new species Fig. 1–22.

♂ imago (in alcohol and pinned).—Length: body, 6.0–9.2 mm.; fore wings, 9.8–11.1 mm. Eyes separated on meson of head by a length a little less than maximum width of a lateral ocellus, lower portion of eyes 3/4 length of upper portion; upper portion of eyes light brown, lower portion black. Head dark brown, antennae pale. Basal half of ocelli dark blackish brown, apical half light brown. Thorax dark brown, sutures paler, carinae darker. Wings (Fig. 4–5): longitudinal and cross veins of fore and hind wings light brown; membrane of fore and hind wings hyaline except apical 1/3 of cells C and Sc of fore wings translucent brownish white as in figure 4. Legs: ratios of segments in fore legs, 0.53: 1.00 (3.4 mm.): 0.05: 0.29: 0.26: 0.18: 0.08. Claws of a pair dissimilar, one apically hooked, with an opposing hook (Fig. 6), the other obtuse, pad-like (Fig. 6). Coxae and trochanters of legs brown, remainder of legs paler except apex of femora darker. Abdomen: light brown; terga 2–8 with darker brown markings as in Fig. 10; sterna 1–7 with darker brown markings as in Fig. 11. Genitalia (Fig. 1–3): segment 2 of forceps a little longer in length than segment 3, apex of segment 3 blunt, segment 2 of forceps 1/4 length of segment 1; base of forceps broad, its inner margin forming an extreme angular bend near basal 1/2 of segment 1; length of styliger plate along median line a little less than 1/3 maximum width; penes fused except for apical 1/4; a large, subapical, wide based, dorsal spine near lateral margin of each penis lobe; forceps and penes light brown. Terminal filament a little longer than cerci, caudal filaments light brown.

♀ imago (in alcohol and pinned).—Length: body, 7.2–7.8 mm.; fore wings, 10.0–11.1 mm. Eyes separated on meson of head by a length 4 times as great as maximum width of an eye; eyes black. Head and antennae light brown. Basal half of ocelli dark brown, apical half white. Thorax dark brown, sutures paler, carinae darker, lateral margins of pronotum washed with blackish brown. Wings: longitudinal and cross veins of fore and hind wings brown; membrane of fore and hind wings hyaline except apical 1/3 of cells C and Sc of fore wings translucent brownish white. Legs: coxae dark brown, trochanters brown, remainder of

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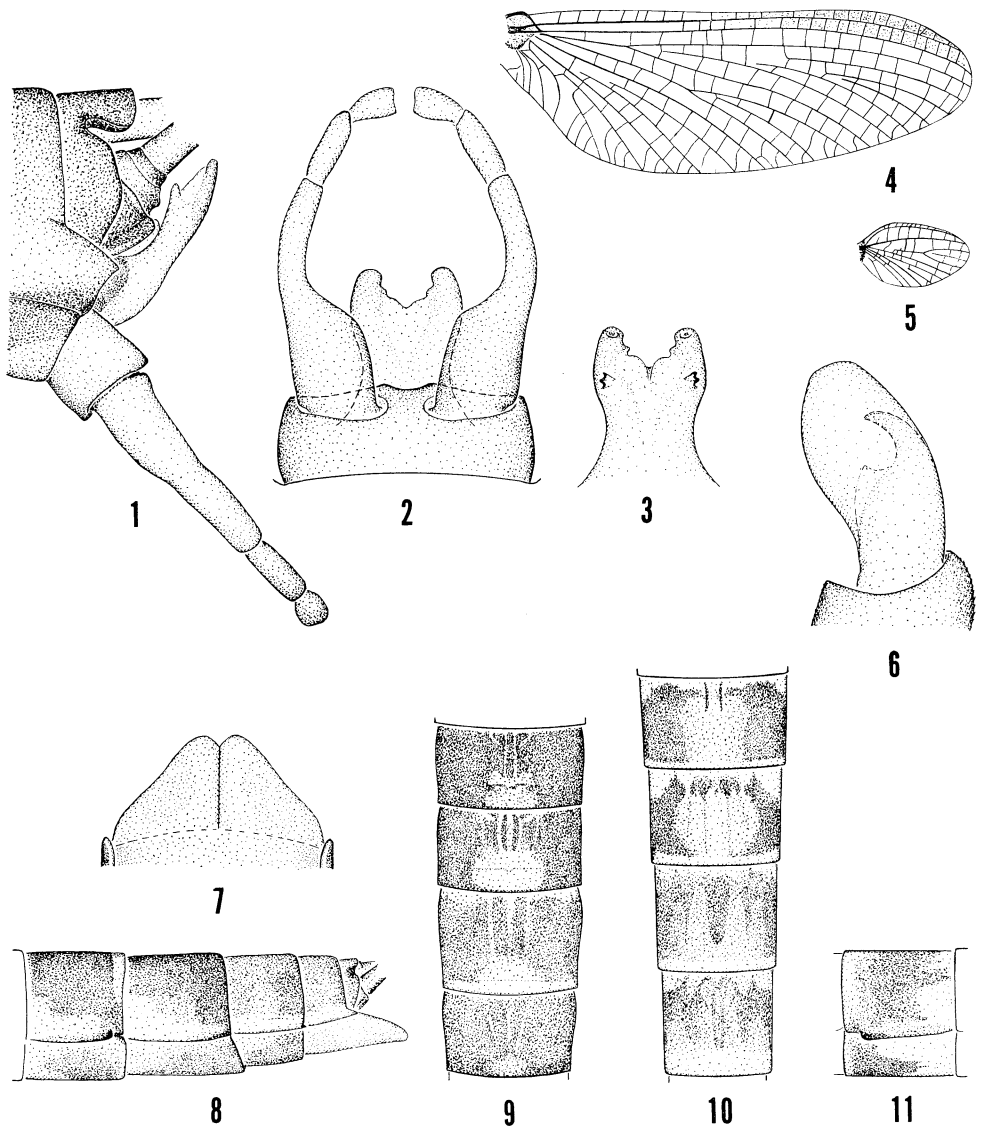

Fig. 1–11. *Atalophlebioioides aucklandensis* n. sp., male and female imagos. Fig. 1–3, genitalia of male: 1, lateral view; 2, ventral view; 3, dorsal view of penes. Fig. 4–5, wings: 4, fore wing; 5, hind wing. Fig. 6, claw of fore leg of male. Fig. 7, ventral view of 9th sternum of female. Fig. 8–9, abdominal segments of female: 8, lateral view of segments 6–10; 9, dorsal view of segments 4–7. Fig. 10–11, abdominal segments of male: 10, dorsal view of segments 4–7; 11, lateral view of segment 6.

legs light brown except apex of femora darker. Abdomen: brown, terga 2–8 with darker brown markings as in Fig. 8 and 9, remainder of terga uniformly washed with darker brown. Ninth sternum shallowly cleft (Fig. 7). Terminal filament a little longer than cerci, caudal filaments light brown.

Mature nymph (in alcohol).—Head prognathous, brown. Antennae 3 times as long as maximum length

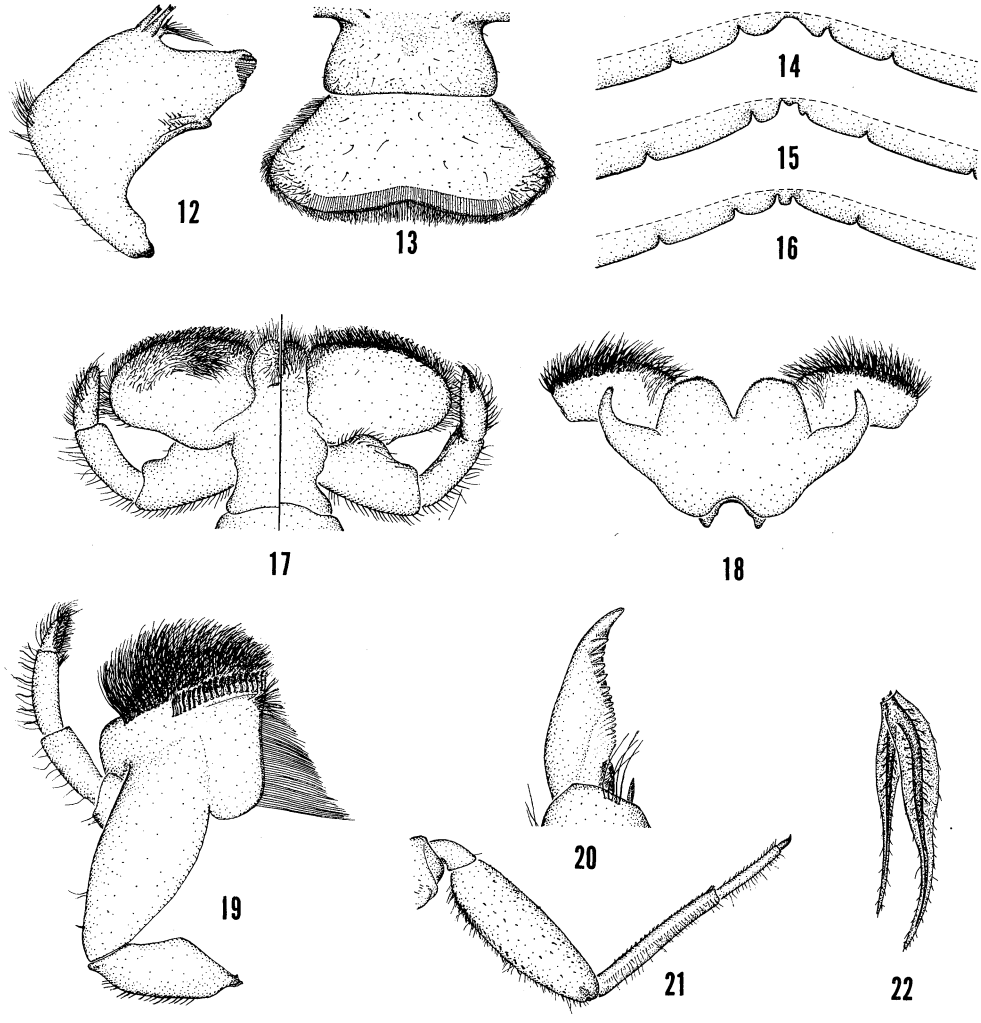

Fig. 12–22. *Atalophlebioides aucklandensis* n. sp., nymph. Fig. 12–19, mouthparts: 12, left mandible; 13, clypeus and labrum; 14–16, enlargement of denticles on anteromedian emargination of labrum; 17, labium; 18, hypopharynx; 19, ventral view of right maxilla. Fig. 20, fore claw. Fig. 21, fore leg. Fig. 22, gill 4.

of head. Mouthparts (Fig. 12–19): brown; dorsal hair on labrum as in Fig. 13; submedian and anterolateral areas of hair ventrally; blunt denticles on anteromedian emargination variable as in Fig. 14–16. Clypeus as in Fig. 13. Left mandible as in Fig. 12. Lingua of hypopharynx with well developed lateral processes (Fig. 18), anterior margin deeply cleft; superlingua of hypopharynx as in Fig. 18, with a row of hair along anterior margin. Segment 2 of maxillary palpi a little longer than length of segment 1, segment 3 of palpi 1/2 length of segment 2, triangular; a V-shaped ridge near ventral, inner anterolateral margin of maxillae; hair on maxillae as in Fig. 19. Labium as in Fig. 17; segment 2 of palpi a little shorter in length than segment 1; segment 3 of palpi 2/3 length of segment 2, triangular; paraglossae ventral to glossae. Thorax brown. Legs (Fig. 20–21): light brown, apex of femora darker; apex of claws hooked and narrow, denticles on claws

progressively larger apically. Abdomen: brown, darker brown markings on sterna as in male and female imagos. Gills (Fig. 22): gills 1–7 alike, gray; dorsal and ventral portions of lamellae slender, lanceolate; main trunk of tracheae along median line of lamellae, tracheae on both sides of main trunk branched, main trunk of tracheae black, branches lighter. Posterolateral spines on abdominal segments 7–9, spines progressively larger posteriorly. Terminal filament a little longer than cerci, caudal filaments light brown.

Types. Holotype male imago (in alcohol), Auckland Is (N), rocky stream, Bivouac Hill, Mt Eden, 540 m, 6–17.I.1963, J. L. Gressitt; allotype ♀ imago (in alcohol), same data as for holotype; paratypes: 2 ♂ imagos (in alcohol), 17 ♂ subimagos (in alcohol), 1 ♀ imago (in alcohol), 12 ♀ subimagos (in alcohol), 70 nymphs (in alcohol), 8 ♂ imagos (pinned), 25 ♂ subimagos (pinned), 3 ♀ subimagos (pinned), same data as for holotype; 1 ♂ imago (in alcohol), 1 ♂ subimago (pinned), 2 nymphs (in alcohol), Auckland Is (N), Grey Duck Creek, Laurie Hrbr, 9.I.1963, K. A. J. Wise; 13 nymphs (in alcohol), Auckland Is (N), stream, Ranui Cove, 31.XII–1.I.1963, Wise; 2 ♂ imagos (pinned), 1 ♂ subimago (pinned), Auckland Is (N), Webling Bay, 13.I.1963, Wise; 11 ♂ imagos (in alcohol), 4 ♂ subimagos (in alcohol), 1 ♀ imago (in alcohol), 3 ♀ subimagos (in alcohol), 6 nymphs (in alcohol), 1 ♂ imago (pinned), 1 ♀ imago (pinned), 1 ♀ subimago (pinned), Auckland Is, Adams I, stream, Magnetic Cove, 19.I.–3.II.1966, Wise; 2 nymphs (in alcohol), Auckland Is, Adams I, stream below waterfall, Waterfall Valley, 2.II.1966, Wise; 1 ♂ imago (in alcohol), 3 nymphs (in alcohol), Auckland Is, Adams I, inlet stream to Lake Turbott, 26.I.1966, Wise; 6 nymphs (in alcohol), Auckland Is, Adams I, streamlet at 30′, W. end of island, 23.I.1966, Wise. Holotype, allotype, 6 ♂ imaginal paratypes, 12 ♂ subimaginal paratypes, 4 ♀ subimaginal paratypes, and 19 nymphal paratypes (30 specimens pinned, 13 in alcohol) deposited in the collections of the Entomology Division, D.S.I.R., Nelson, New Zealand; 5 ♂ imaginal paratypes, 1 ♀ imaginal paratype, 12 ♂ subimaginal paratypes, 4 ♀ subimaginal paratypes, and 19 nymphal paratypes (12 specimens pinned, 29 in alcohol) deposited in the collections of the B. P. Bishop Museum, Honolulu; 5 ♂ imaginal paratypes, 1 ♀ imaginal paratype, 7 ♂ subimaginal paratypes, 3 ♀ subimaginal paratypes, and 19 nymphal paratypes (6 specimens pinned, 29 in alcohol) each deposited in the collections of Florida A & M University and the University of Utah, Salt Lake City; 3 ♂ imaginal paratypes, 7 ♂ subimaginal paratypes, 3 ♀ subimaginal paratypes, and 19 nymphal paratypes (6 specimens pinned, 26 specimens in alcohol) deposited in the collections of the Australian National Collection, Canberra; 2 ♂ imaginal paratypes, 2 ♂ subimaginal paratypes, 2 ♀ subimaginal paratypes, and 7 nymphal paratypes (13 specimens in alcohol) are deposited in the collections of the Limnologische Flussstation des Max-Planck-Instituts für Limnologie, Schlitz.

Association of the ♂ and ♀ imagos and the nymphs is based on similarities of the abdominal color patterns and the darker color at the base of the femora of specimens collected at the same locality. Among specimens from the various localities, a few specimens are uniformly darker brown while other specimens are uniformly light brown with less distinct color markings.

Biology. The nymphs of *A. aucklandensis* were collected from under rocks in small streams. Most subimagos were collected sitting on wet rocks along the streams, while imagos were collected swarming above the streams.

Discussion. To date, species of *Atalophlebioides* Phillips (1930), *Deleatidium* Eaton (1899), and *Zephlebia* Penniket (1961) have been described from New Zealand. Of these 3 genera, the new species *aucklandensis* is a representative of *Atalophlebioides* based on the following combination of characters. In the imagos, (1) the cubital angle of the fore wings is well developed and rounded (Fig. 4), (2) vein Sc of the hind wings extends almost to the apex of the wings (Fig. 5), (3) the penes of the ♂ genitalia are fused except for the apical 1/4 to 1/2 (Fig. 2–3); the apex of each penis lobe is knob-shaped (Fig. 2–3), and (4) the apex of segment 3 of the ♂ genital forceps is blunt (Fig. 1–2).

In the nymphs, (1) the hair on the outer margin of the mandibles is present only near the middle of the margin (Fig. 12), (2) a V-shaped ridge is present near the ventral, inner anterolateral margin of the maxillae (Fig. 19), (3) no large well-rounded, apparent denticles are present on the anteromedian emargination of the labrum (Fig. 13–16), and (4) the dorsal and ventral portions of abdominal gills 1–7 are slender, lanceolate (Fig. 22).

The genus *Atalophlebioides* was described by Phillips (1930) as a subgenus of *Deleatidium*. Phillips placed all species in which the gills had double lamellae in the subgenus *Atalophlebioides*, and those in which the gills had a single lamella in the subgenus *Deleatidium* s.s. Ulmer (1938), Traver (1946), and Peters and Edmunds (1964) considered *Atalophlebioides* worthy of generic rank, whereas Harker (1954) agreed with Phillips (1930). Peters and Edmunds (1964) designated *A. cromwelli* as the type species. Species of *Atalophlebioides* have been described from New Zealand, Australia, and Tasmania, and *A. aucklandensis* appears to be most closely related to the species from New Zealand.

Only 2 species of *Atalophlebioides*, *A. sepia* Phillips (1930) and *A. cromwelli* Phillips (1930), have been described from New Zealand. *A. aucklandensis* can be distinguished from the 2 species by the following combination of characters. In the imago, (1) all longitudinal veins in the fore and hind wings of the males and females are light brown to brown, (2) the apex of the femora of the males and females is dark brown, (3) the color patterns on the abdomen of the males and females are as given in figures 8–11, (4) a large, subapical, wide-based, dorsal spine is present near the lateral margin of each penis lobe of the male genitalia (Fig. 3), and (5) the caudal filaments of the males and females are light brown. In the nymphs, (1) the anteromedian emargination of the labrum is shallow (Fig. 13–16), (2) the apex of the femora is dark brown, and (3) the dorsal and ventral portions of abdominal gills 1–7 are slender, lanceolate (Fig. 22).

LITERATURE CITED

Eaton, A. E. 1899. An annotated list of the Ephemeridae of New Zealand. *Trans. Entomol. Soc. Lond.* **1899** (3): 285–95, 6 fig.

Harker, J. E. 1954. The Ephemeroptera of Eastern Australia. *Trans. R. Entomol. Soc. Lond.* **105:** 241–68, 90 fig.

Penniket, J. G. 1961. Notes on New Zealand Ephemeroptera. I. The affinities with Chile and Australia, and remarks on *Atalophlebia* Eaton (Leptophlebiidae). *N.Z. Entomol.* **2**(6): 1–11, 5 fig., 2 tables.

Peters, W. L. & **G. F. Edmunds, Jr.** 1964. A revision of the generic classification of the Ethiopian Leptophlebiidae (Ephemeroptera). *Trans. R. Entomol. Soc. Lond.* **116:** 225–53, 141 fig.

Phillips, J. S. 1930. A revision of New Zealand Ephemeroptera. Part 2. *Trans. N.Z. Inst.* **61:** 335–90, 47 fig.

Traver, J. R. 1964. Notes on Neotropical mayflies. Part I. Family Baetidae, subfamily Leptophlebiinae. *Rev. de Entomol.* **17:** 418–36, 30 fig.

Ulmer, G. 1938. Chilenische Ephemeropteren, hauptsachlich aus dem Deutschen Entomologischen Institut, Berlin-Dahlem. *Arb. Morphol. Taxon. Entomol.* **5:** 85–108, 16 fig.