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### A BAETINE MAYFLY NYMPH WITH TUSKED MANDIBLES

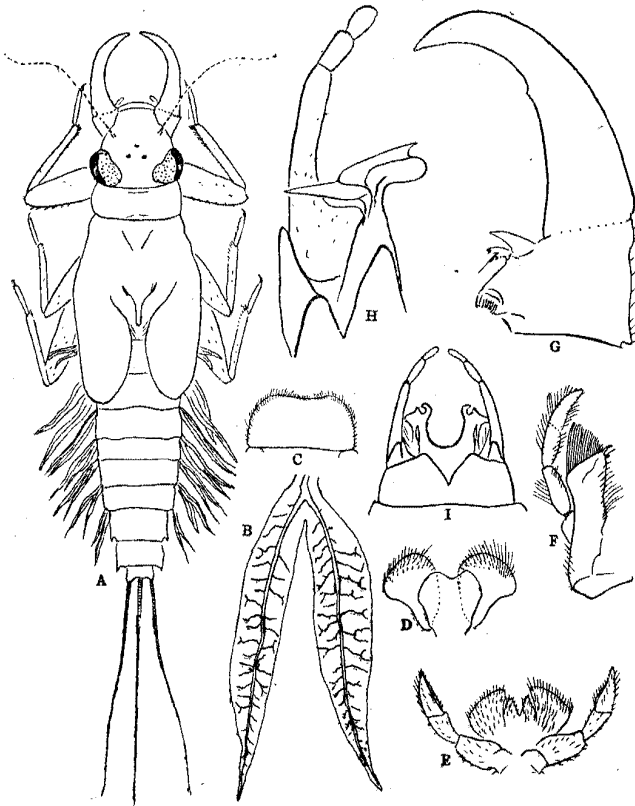
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This paper is to record the discovery of a mayfly nymph of very surprising form. It comes from the Ogden River in Utah. I collected it along with other aquatics on a hasty trip to that river, just before leaving Utah in July, 1926.

After returning home, on looking over the material collected I found one broken specimen. It had huge mandibular tusks, such as have hitherto been supposed to be the exclusive mark of nymphs of the Ephemerinae, but combined with a body like that of the Baetinae. It was a genuine puzzle.

Dr. H. J. Pack was with me when this unique specimen was collected and knew the exact spot in the north fork of Ogden River whence it had come; so, I sent a drawing of it to him at Logan and suggested the desirability of obtaining more and better specimens. He at once went after them, making a special trip from Logan for the purpose. He succeeded in getting several dozen grown nymphs; and not only that, but on taking them back to Logan alive, reared a number of specimens of both sexes. To Dr. Pack therefore is wholly due our knowledge of its life history and our positive assurance as to its systematic position.

When his reared specimens reached me an examination of the adult revealed to my astonished eyes a *Leptophlebia*! That a nymph with such huge mandibular tusks could be congeneric with ordinary *Leptophlebia* nymphs that have no tusks at all, seemed hardly believable. Yet the adult seemed not to be generically distinguishable. It is merely another remarkable illustration of the phenomenon, already well known in Ephemera, of specialisation in nymphs independently of the adult. The brief life of the imago is free from the business of getting a living; the struggle for existence falls mainly on the nymphs, and so it is the immature stages that show differentiation.



*Leptophlebia packii* n. sp. A., nymph; B, gill-lamellae; C-F, mouth-parts of nymph; G, mandible with tusk; H, I, adult male genitalia.

Both stages may be described as follows:

***Leptophlebia packii* n. sp.**

*Adult.* Length, male and female, 8 mm., with tails 11 mm. additional. Fore leg of male 12 mm.; of female 7.5 mm.

As in size, so in coloration the sexes are similar. Both are blackish and nearly concolorous of body, with brownish appendages. Head, dull black. Thorax black, shining and polished above and below, becoming brownish and duller about the bases of the legs and wings. Legs brown with the knee joint blackish. Wings hyaline with brown veins, and very pale cross veins. There is a deeper tinge of brown at the very base, extending as far out as the humeral crossvein.

Abdomen dull blackish brown, not translucent in the male on the middle segments in this species, only a little lighter in color on the basal half of these segments. Tails brown at base rapidly becoming paler as they taper to very slender inconspicuous tips. Male genitalia as shown in figures H and I, with a large basal swelling on the first joint of the forceps, the notched tips of the penes separated by a broadly U-shaped interval, the recurved process lance-triangular, tapering to a thin flat point. The 9th sternite of the female is produced posteriorly in a pair of triangular lobes that extend beyond the apex of the annular roth segment more than the length of that segment.

The subimago is similar, but duller in color and more greyish.

*The nymph* measures in length 9 mm., with tusks 1.5 mm. and tails 9 mm. additional.

Body elongate, with rather high thorax and depressed abdomen. Color greenish brown, paler beneath, with diffuse sooty-black patches segmentally arranged along the sides of the abdomen above. These patches are repeated beneath on segments 8 and 9.

Head wider than long, with vertical face, antennae pale beyond the two brown-ringed basal segments. Labrum blackish. The huge tusks on the mandibles are ivory yellow beyond their basal constriction, and are bent forward there at an angle with the plane of the face. They are flat and smooth and incurved, with sometimes a suggestion of a denticle near the middle of the concave inner margin. The other mouthparts are as shown in figures C, D, E and F.

The legs are long and slender, very sparsely clad with thin hairs. The fore legs are longest; and at the inner apical angle of the front tibia there is no "thumb" process, but only a denser fringe of short scurfy hairs. Color of all legs pale with three darker bands, one at the knee, one near the middle of the tibia, and one on the base of the tarsus; claws almost smooth, with only very faint denticulations basally beneath.

The gills are similar on abdominal segments 1 to 7, larger on the middle segments. Each gill is divided almost to the base in two long, lanceolate, acuminate lobes, in each of which there is a coarse central trachea which bears short pinnately arranged branchlets. There are short, sharp lateral spines on abdominal segments 8 and 9, pointing a little outward, but with their sharp tips bent parallel. Tails long tapering, very close-ringed especially at the base but the joinings are not marked with color, and the whorls of fine setae about them are very inconspicuous.

The venation of the wings is very similar to that of the more typical species of *Leptophlebia*. Vein  $Cu_2$  appears to be detached, owing to the fading out of its basal portion. The posterior fork of the median vein appears more nearly symmetrical (less skewed posteriorly) than in the typical species. The slant crossveins of the stigmatic area are very inconstant, being simple, forked, or anastomosing, and traversing one or two rows of cells.

Dr. Pack writes me that he secured the nymphs of this species in the shallow water along the edge of the stream. This was in the north or left fork of Ogden River where crossed by the highway near its junction with the main stream. Within two or three days after he took them alive to Logan, they began

to emerge. They did not shed the subimaginal skin until forty eight hours or more after emergence. About a dozen specimens were reared, and among them two males attained fully adult coloration.

The type is in the Cornell University collection and paratypes are there also, and in the Utah Agricultural College collection, in the Canadian National collection at Ottawa, and in the U. S. National Museum.

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