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New Zealand Cave Fauna—I. The Larva of *Duvaliomimus mayae* Britton 1958 (Coleoptera; Carabidae: Trechinae)

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*Abstract*

A trechine larva trapped in association with adults of *Duvaliomimus mayae* Britton, in a cave near Waitomo, and presumed to be the same species, is described and compared with larvae of four allied European and Japanese cavernicolous species. Similarity to one of these is remarkable.

INTRODUCTION

A baited trap placed in White's Cave, near Waitomo, in April, 1962, yielded two adults and what is presumed to be a final instar larva of the trechine carabid *Duvaliomimus mayae*. The instar was estimated from relative sizes of larval and adult head capsules. This troglitic species is fairly numerous in caves of the Te Kuiti limestone area. No other carabids have been taken from the cave in question.

This unique specimen was not dissected and some small details have had to be omitted from the description. The number of hairs in the mandibular penicillus and of the dorsal maxillary microchaetae was not determined with certainty. Text figures were drawn with the aid of a camera lucida.

*Duvaliomimus mayae* Britton 1958. larva (Figs. 1-6).

LENGTH: 8.0 mm.

COLOUR: Creamy white; head, prothorax and setae pale testaceous.

Head 1.15 times longer than wide, sides parallel, slightly narrowed at base; frontal sutures bisinuate; nasale (Fig. 4) finely but irregularly denticulate, median lobe obtusely produced, lateral lobes barely perceptible; apical portion with a pair of sensorial fossae, "ocelles sensitifs" of Coiffait (1951) mentioned by Decou (1961); adnasale with angles obtuse; ocelli absent.

Antennae (Fig. 3) 4-segmented, as long as mandibles; proximal segment with 1 dorsal and 2 ventral sensorial fossae; segment 2 with an apical internal macrochaeta; segment 3 with 2 external, 1 internal macrochaetae; base of lobe with 3 sensorial styli, considered by Decou (*loc. cit.*) to be evaginations of the integument; segment 4 with 1 median and 4 subapical macrochaetae, 3 apparently 2-segmented sensorial styli on the enlarged apex.

Mandibles (Fig. 5) falciform, with a strong, horizontally directed, external, median seta, 2 dorsal sensorial fossae and at base, a penicillus of plumose hairs reaching halfway to retinaculum. Maxillae (Fig. 2b) with stipites attaining segment 2 of labial palpi, bear-

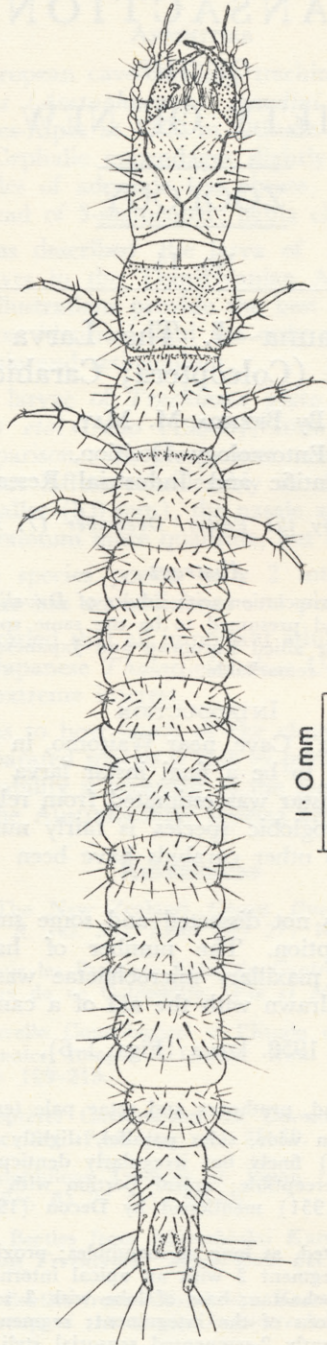
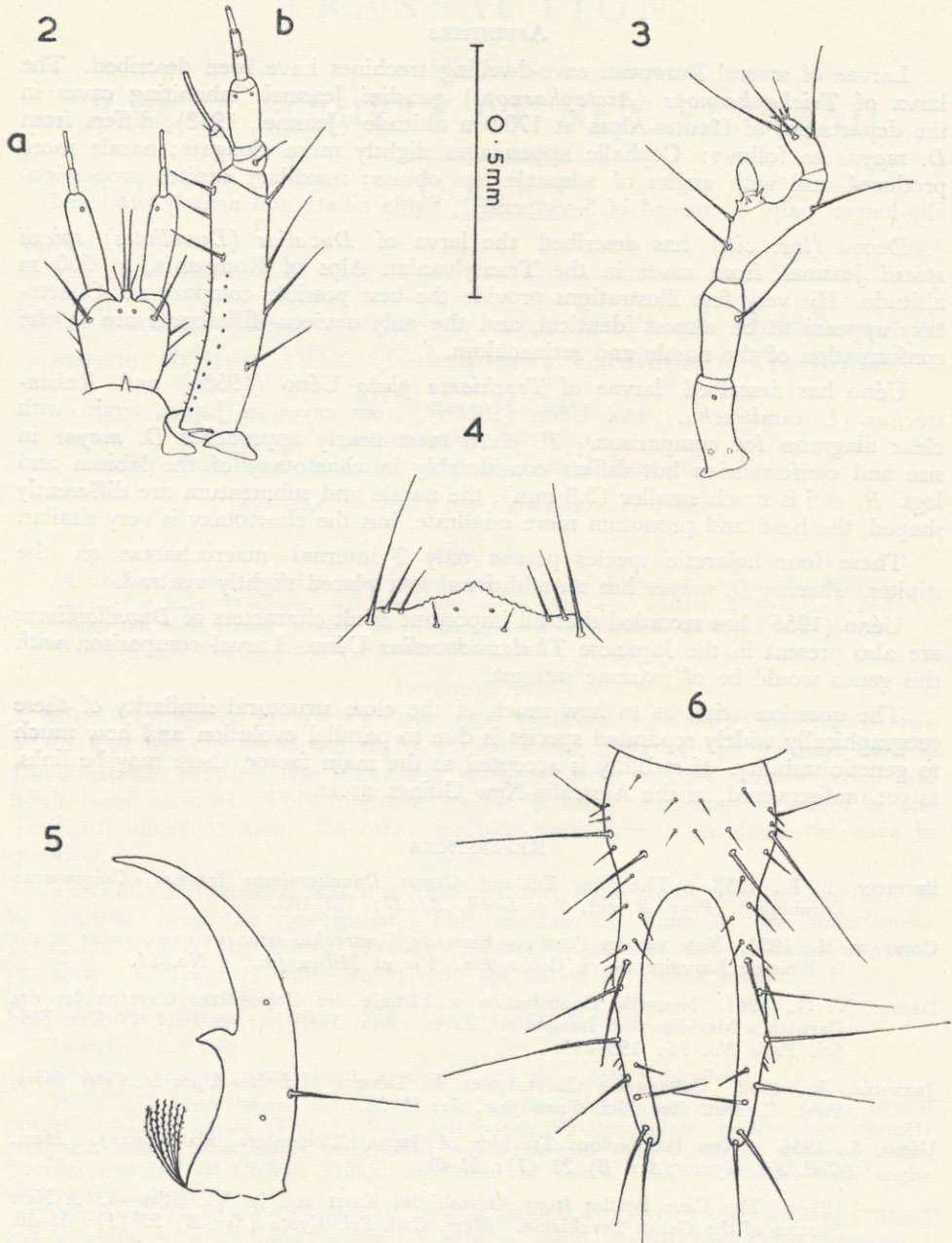


FIG. 1.—*Duvalliomimus mayae* Britton. Larva, dorsal view.

ing 4 external, 3 internal macrochaetae and a dorsal, longitudinal row of 11 or 12 microchaetae; palpi 5-segmented; galea with proximal segment bearing an apical microchaeta. Labium (Fig. 2a) with prementum trapezoidal, bearing on each side 3 lateral and 1 ventro-lateral setae and 2 median sensorial fossae; ligula small, quadrate, with 4 apical setae, the internal pair being nearly 3 times longer than the external; palpi 4-segmented; submentum bearing plumose hairs twice length of mandibular penicillus.



Figs. 2-6.—*Duvaliomimus mayae* Britton. Larva. Fig. 2a—Labium, ventral view. b—Left maxilla, ventral view. Fig. 3—Left antenna, dorsal view. Fig. 4.—Nasale. Fig. 5.—Right mandible, dorsal view. Fig. 6.—Telson, dorsal view.

Pronotum 1.4 times wider than long, with sides rounded, lightly chitinised, clothed with scattered long and short setae. Meso- and metanotum similarly clothed but unchitinised.

Abdominal segments unchitinised, with clothing similar to thorax; segment 9 (telson) with chaetotaxy as in Fig. 6; cerci as long as anal tube when pseudopods retracted.

Tarsi with single claw bearing 2 short setae at base.

## AFFINITIES

Larvae of several European cave-dwelling trechines have been described. The larva of *Trichaphaenops* (*Arctaphaenops*) *gaudini* Jeannel, inhabiting caves in the department of Hautes-Alpes at 1700 m altitude (Jeannel, 1952), differs from *D. mayae* as follows: Cephalic appendages slightly more elongate; nasale more produced and with angles of adnasale less obtuse; maxillary stipites proportionally longer, palpi 4- instead of 5-segmented; ligula ciliate and acutely produced.

Decou (*loc. cit.*) has described the larva of *Duvalius* (*Duvaliotes*) *spiessi* Jeannel, from caves in the Transylvanian Alps of Roumania, at 500 m altitude. His very fine illustrations provide the best possible comparison. Chaetotaxy appears to be almost identical, and the only obvious differences are in the conformation of the nasale and retinaculum.

Uéno has described larvae of *Trechiana pluto* Uéno (1958a) and *Rakan-trechus* (*Uozumitrechus*) *etoi* Uéno (1958b), from caves in Japan, again with clear diagrams for comparison. *T. pluto* most nearly approaches *D. mayae* in size and conformation but differs considerably in chaetotaxy of the labium and legs. *R. etoi* is much smaller (5.0 mm), the nasale and submentum are differently shaped, the head and pronotum more quadrate, but the chaetotaxy is very similar.

These four holarctic species possess only 2 internal macrochaetae on the stipites, whereas *D. mayae* has an additional seta placed slightly ventrad.

Uéno (1956) has recorded that all important adult characters of *Duvaliomimus* are also present in the Japanese *Thalassoduvalius* Uéno. Larval comparison with this genus would be of extreme interest.

The question arises as to how much of the close structural similarity of these geographically widely separated species is due to parallel evolution and how much to genetic stability. If stability is accepted as the main factor, there may be links, as yet undiscovered, in the Australia-New Guinea areas.

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