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THE LARVA OF *AGRIOGOMPHUS TUMENS* CALVERT (ANISOPTERA: GOMPHIDAE)

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The larva is described and illustrated from 2 ultimate and 2 younger instars, collected in Veracruz, Mexico, and in Provincia Limón, Costa Rica. Its structural features are compared with those of *A. sylvicola* Sel. and *A. ericae* Belle.

INTRODUCTION

The genus *Agriogomphus* comprises four species of exclusively neotropical dragonflies. It is represented in Mexico and Central America by *A. tumens* Calvert only (PAULSON, 1982). In Mexico adults of *A. tumens* have been collected only from Veracruz State, always associated with the tropical rain forest, mainly in the region of "Los Tuxtlas". The larvae can be found under decayed leaves deposited on mud banks where the water flow is slow, and are completely cryptic in such substrates. Both adults and larvae occur at low densities, at least so in the "Los Tuxtlas" area.

Larvae of two species of *Agriogomphus* have been described earlier viz. *A. sylvicola* Selys by NEEDHAM (1944) and *A. ericae* Belle by BELLE (1966 in *Ischnogomphus*), while ARANGO & ROLDAN (1983) have illustrated, by supposition, the larva of *A. jessei* Williamson.

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Figures 1-6

Material. — MÉXICO: Veracruz, Estación de Biología Tropical "Los Tuxtlas", stream of Laguna Azul, 17-VI-1985, 1 ♂ (probably antepenultimate instar), 1 ♀ (probably penultimate instar), V. García & E. González leg.; stream of Laguna Escondida, 28-V-1986, 1 ♀ (ultimae instar), R.

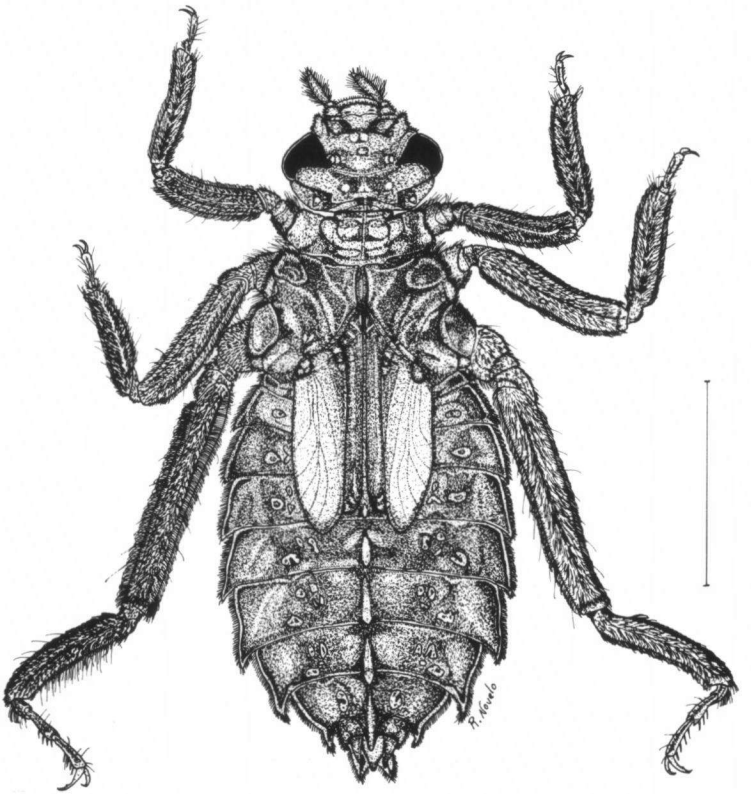
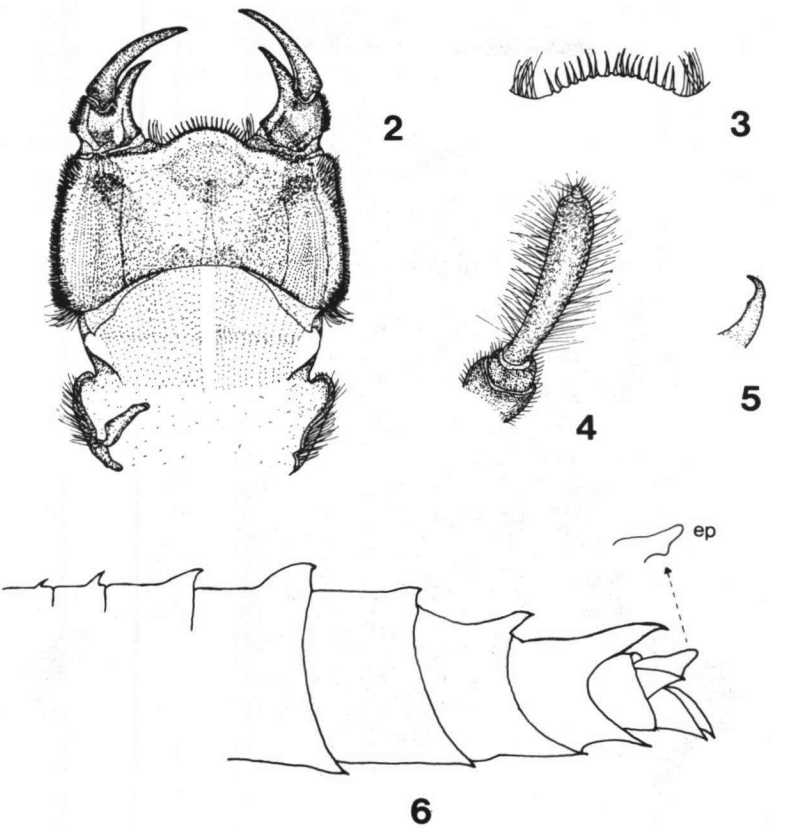


Fig. 1. General aspect of larva of *Agriogomphus tumens* Calvert (♀, ultimate instar), in dorsal view. — [Bar = 5 mm].

Novelo leg. — COSTA RICA: Prov. Limón, Río Hondo, km 10 Rt Siquerres-Pto. Limón, 27-IV-1984, 1 ♀ (ultimate instar), J. Bueno leg.; deposited at Colección de Insectos Acuáticos del Insectario-CBS, Universidad Autónoma Metropolitana-Xochimilco, México, D.F.

DESCRIPTION. — Larvae brown, broadly depressed, plentifully covered by short, scale-like setae. Head wider than long, with eight protuberances arranged in the following manner (Fig. 1): one above the base of each antenna forming a ridge between the antenna and compound eye and directed anteriorly; one on internal margin of each lateral ocellus; one on each cephalic lobe (last two sets of protuberances directed dorsally); one subgenal protuberance on each side of labium, near bases of maxillae directed ventrally. Posterior margin of head concave. Antennae rather long and very prominent with third joint distinctly clavate (Fig. 4), thinly fringed along sides with long, white, soft hairs; fourth joint



Figs 2-6. Details of the morphology of larva of *A. tumens*, not to same scale: (2) Labium, dorsal view; — (3) Anterior margin of median lobe showing spiniform setae and tufts of hair-like setae; — (4) Right antenna, dorsal view; — (5) Lateral view of the tarsal claw showing ventral subapical projection; — (6) Lateral view of abdominal segments 3-10, showing the dorsal hooks and caudal appendages (ep = epiproct).

a conic rudiment. Labium short and thick (Fig. 2): prementum wider than long; its lateral margins fuzzy rather than merely pubescent; front margin of median lobe moderately convex and slightly crenulate (Fig. 3), armed with long, sharp tapering spiniform setae in a single open series, flanked by tufts of long hair-like setae; hinge does not reach mesosternum; palpi short, bare and toothless on inner side (Fig. 2): palpal lobe and movable hook sharp.

Pronotum bordered anteriorly by straight, raised ridge-like margin; lateral margins raised and divergent, posterior margin straight, not raised. Synthorax stout with broadly sloping sides; metanotum with pair of rounded tubercles

densely covered by deep brown scale-like setae, one at each base of hind wing pads at level of wing anal region; wing pads parallel, reaching backward well upon the fifth abdominal segment. Legs flattened laterally and densely covered with scale-like setae; front legs shortest, hind legs longest (Fig. 1); hind femora almost three times as long as front femora. Front and middle tibiae lack usual Gomphidae burrowing hooks; tarsi slender; claws have a small subapical projection on the inferior border (Fig. 5); there is a small pad-like empodium on all tarsi.

Abdomen short, wide and greatly depressed, widest on segments 5 and 6, quickly tapering thereafter to the end. Lateral spines on segments 3-9 (Fig. 1), increasing in size from front to rear as far as 8, slightly shortened on 9 and reduced and appressed on 10. Dorsal hooks on segments 3-9, small on 3-4, moderately developed on 5, and very conspicuous on 6-9; they are laterally flattened, blunt-tipped on 5-7 but rather sharp on 3-4 and 8-9; that on 9 reaches as far as half of epiproct. Caudal appendages short and very wide at bases; epiproct narrows abruptly at apical half, ending bluntly; its inferior margin has a subapical lobe (Fig. 6); paraprocts pyramidal with a rather sharp tip; cerci triangular with a very sharp tip; epiproct 0.72 and cerci 0.55 of length of paraprocts. There are abundant, short, closely-packed setae on the lateral margins of each abdominal segment, including the spines. Dorsally and ventrally there are small, shining areas without setae which give the abdomen a very peculiar mottled aspect, because in these areas particles of sand and silt do not closely adhere as they do on areas provided with setae. Ventrally two parallel sutures along the abdomen diverge at both ends. Female gonapophyses rudimentary, scarcely reaching 0.10 the length of sternite 9; they are not visible in the male.

Measurements (mm). — Total length, including caudal appendages 16.5-17.7; width of head across eyes 4.1; front femora 2.5-2.6; front tibiae 3.2-3.3; middle femora 3.9-4.0; middle tibiae 3.3-3.5; hind femora 6.0-6.3; hind tibiae 4.0-4.6.

DISCUSSION

Comparing the descriptions of NEEDHAM (1944), BELLE (1966) and my own, larvae of *A. tumens* are more similar to those of *A. ericae* than those of *A. sylvicola.* The most outstanding differences between *A. tumens* and *A. ericae* are: the premental hinge does not reach the mesosternum in *tumens;* the maximum development of lateral spines of abdomen is on segment 8 in *tumens* and on 7 in *ericae;* the caudal appendages are blunt-tipped on *ericae* but only the epiproct end is blunt in *tumens.* Nevertheless, they show a notable resemblance in measurements and in shape and size of abdominal dorsal hooks, especially in the shape of the hook on segment 9.

The larva of *A. sylvicola* is the smallest of the three species and its abdominal dorsal hooks are remarkably different from those of *tumens* and *ericae,* mainly in

the length and shape of the hook on segment 9. The inferior border of tarsal claws, empodia, tubercles of metanotum, and inferior subapical lobe of epiproct that I describe for *A. tumens,* were not mentioned by NEEDHAM (1944) or BELLE (1966). However, I think that the main features to separate the species of *Agriogomphus* are the shape and size of the abdominal lateral spines and dorsal hooks. In view of the available information on the morphology of *Agriogomphus* larvae, I share the opinion expressed by Fraser in 1943 (cited by BELLE, 1966), based on the adults, and by BELLE (1975), that the genus *Ischnogomphus* was correctly synonymized with *Agriogomphus.*

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