



Description of the larva of *Oulimnius echinatus* Berthélemy (Coleoptera: Elmidae: Elminae)

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The mature larva of *Oulimnius echinatus* Berthélemy is described for the first time, based on material from Mallorca (Spain). Morphologically the larva of *O. echinatus* resembles those of *O. jaechi* Hernando, Ribera & Aguilera and *O. fuscipes* (Reiche, 1879), from which it differs in the distinctly denser dorsal granulation, the less prominent setiferous tubercle on posterior angles of tergites and the absence of mesal setiferous tubercle on tergites and ventrites. We used for the first time scanning electron microscopy to describe the morphology of an *Oulimnius* larva.

The genus *Oulimnius* Gozis occurs in Europe, North Africa and North America (Kodada & Jäch 2005; Jäch *et al.* 2006). To date, 16 species and subspecies have been described, although the systematic position of the two American species within the genus is open to question.

The morphology and diagnostic features of adults have been described in all species, but the knowledge of the larva is still incomplete (Hernando *et al.* 1998). Until now, only the larva of five species have been described: *O. tuberculatus* (Müller), *O. troglodytes* (Gyllenhal), *O. rivularis* (Rosenhauer), *O. latiusculus* (LeConte) and *O. jaechi*.

Oulimnius echinatus was described from eastern Mallorca (Berthélemy 1979). It is the only Elmidae species known from the Balearic Islands, occurring only in Mallorca and Menorca (Rico 1996; Rico & García-Avilés 1998). According to Sánchez-Fernández *et al.* (2008), this species is highly vulnerable, and so any information about its adult or larval stages can contribute to conservation efforts.

This paper provides a detailed description of mature larva of *O. echinatus* and its comparison with known larva. SEM was used to provide detailed information on the larval morphology, and to allow the comparison of the larva of *Oulimnius* with that of other elmid genera.

For the description, two mature larva were available, collected in the western part of Mallorca (Banyalbufar, tn. s'Alga C710, km90, 146m a.s.l., N39°40'29.5" E2°29'52.4"). The larva were cleaned of dirt, dissected and examined with a Nikon SMZ-1B stereo-microscope under diffuse lighting at magnifications up to 140×. For scanning electron microscopy, larva were dehydrated in a graded ethanol series, air-dried from absolute ethanol, mounted on stubs using double-faced tape, sputter-coated with gold and viewed in a Hitachi S800 at 15 kV. Metric characters were measured to the nearest 0.05 mm using a Nikon stereo-microscope with an ocular scale. Larval morphological nomenclature follows Lawrence (1991). Material examined is deposited in the CCB–Collection (F. Čiampor), Bratislava, Slovakia.

Oulimnius echinatus Berthélemy

(Figs 1–11)

Description of the larva. Habitus (Fig. 1). Length 2.80–2.90 mm, greatest width 0.70 mm. Dorsal side dark gray, ventral side paler; areas around eyes, antennae and legs except coxae pale yellow, mouth parts and apex of ninth abdominal segment darkened to brown. Body elongate, tapering posteriorly; moderately convex dorsally, almost flat ventrally, subtriangular in cross-section. Biforous spiracles present laterally on mesothorax and abdominal segments 2–8. Integument with dense setose granules and sparse longer pale hairs (Figs 8, 14).

Head (Fig. 2) dorsoventrally flattened, sides subparallel in posterior portion, prognathous, partially retracted into prothorax; frontoclypeal plate without granules, epicranial plates and genae granulated, granules with small scales.