

## Kleine Mitteilung

The larva of *Calamoceras marsupus* BRAUER, 1865

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With 9 figures and 1 table in the text

## Abstract

The larva of *Calamoceras marsupus* BRAUER is described. The presence of a transversal row of 30 setae across the labrum and the shape of the ventral apotome covering most of the ecdysial line are the most remarkable morphological characteristics of this larva.

## Introduction

The Calamoceratidae is a family with a main tropical and subtropical distribution, being represented in Europe only by the genus *Calamoceras*. This genus has been solely found in Europe and has two described species, *C. marsupus* BRAUER, 1865, which lives in the Iberian Peninsula and France, and *C. iliesi* KUMANSKY & MALICKY, 1974, found in the Balkanic Peninsula.

*C. marsupus* BRAUER (synonym *C. volxemi* McLACHLAN, 1877) is a rather common species widely distributed in Spain and Portugal as the imago collections often show (NAVAS, 1917; TERRA, 1981).

The larva of *C. marsupus* was partially described by COINEAU & JACQUEMART (1963). Their description is restricted to the chaetotaxia of head and thorax, and our view is that is insufficient for a correct determination of the larva.

During a biological study of the river systems around Vila Real (Portugal), one of us has found in different localities several larval specimens whose morphological characteristics generally fitted the descriptions of the larva of *Calamoceras* made by LEPNEVA (1966) and WIGGINS (1978). Specially the presence of a transversal row of setae across the central part of the labrum is a unique feature of this family.

We have not correlated the larva and the adult to check our species determination. However, we assume that the correlation should be accepted taking into account that *C. marsupus* is the only species of Calamoceratidae that lives in Western Europe and has been repeatedly collected near Vila Real in adult stages (McLACHLAN 1884; TERRA, 1981). Also, the characters described by COINEAU & JACQUEMART (1963) are present in our specimens.

### Description of the full-grown larva

Body length: 16–17 mm.

**Head:** Ovoidal shaped and longitudinally elongated (1.8 mm long  $\times$  1.1 mm wide). Chestnut brown coloured, with characteristic whitish dots pattern. Frontoclypeus elongated, with the anterior margin uncoloured; there are three large white marks in the medial line of the frontoclypeus: the anterior one is square-shaped, the central one is irregular and subdivided, and the posterior one is elongated; besides, there are two lateral marks round-shaped at the eye level. In dorsal view (Fig. 2) the parietal region incloses 8 pairs of ovoidal white dots and 2 pairs of large white marks. In lateral view (Fig. 4) the head presents an anterior part uncoloured that also surrounds the eyes; the rest of head is brown coloured, with 22–24 white dots. Ventrally (Fig. 3) the anterior margin of the head is also uncoloured and the rest is brown-chestnut, with several (6–8) white dots.

The ventral apotome, "gular sclerite" after LEPNEVA (1966), is triangular, with the posterior end long and narrow, covering almost the ecdysial line. In earlier laral stages the ventral apotome has not this posterior elongation.

Maxillae with the cardo very sclerotized. Labium with submental sclerites fused into a single one. Mandibles short, massive, black, with the internal surface deeply concave, provided with a long brush of yellow hairs; each mandible has four tooth-like points at the end of its blades.

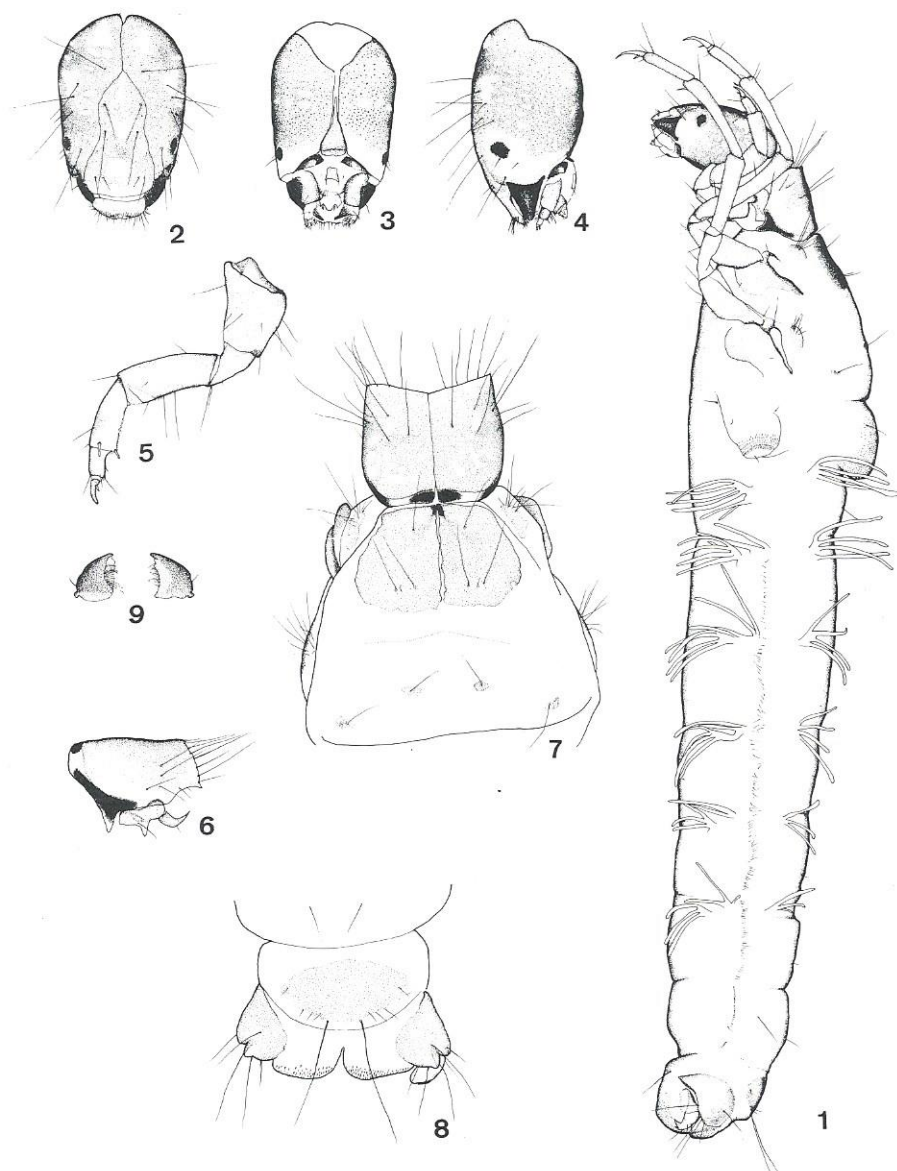
Labrum dorsally characterized by a transversal row of short dark and stout setae (28 to 32) in the central part of it (Fig. 2). Anterior margin with rounded corners, ventrally provided with dense whitish soft hairs and with a membranous projection in the central part.

**Thorax:** Pronotum slightly produced anteriorly, with small projecting tips in the anterolateral corners (Fig. 7); posterior black margin with two unsclerotized zones.

Propleuron (Fig. 6) with an anterior horn-like processes, upward directed. Prosternite represented by two pairs of small sclerites; the posterior one is long and narrow, transverse-obliquely located; the anterior pair is round and provided with a small brown seta on each sclerite.

Mesonotum incompletely sclerotized, with a large central sclerite and two small ones in the anterior corners. The central sclerite is trapezoidal shaped with the anterior margin smaller than the posterior one. The small sclerites are elongated and have 7–9 dark setae each one.

Metanotum divided in three pairs of very small sclerites; the median one bears a single seta ( $s_1$ ) in each sclerite; the posterior one includes a long seta and two short ones ( $s_2$ ) in each sclerite; the anterolateral sclerites are the largest and each one has 9–11 setae ( $s_3$ ) (Fig. 7). Meso- and metasternites are represented by two pairs of transversal sclerites located behind each respective leg.



Figs. 1-9. The larva of *Calamoceras marsupus* BRAUER.

Fig. 1. Lateral view of the larva. - Fig. 2. Head in dorsal view. - Fig. 3. Head in ventral view. - Fig. 4. Head in lateral view. - Fig. 5. Prothoracic leg. - Fig. 6. Prothoracic sclerites in lateral view. - Fig. 7. Thorax in dorsal view. - Fig. 8. 9th abdominal segment tergite and anal legs. - Fig. 9. Mandibles.



Forelegs (Fig. 5) are short and strong, with their tibia provided with a row of large spinules along the ventral side, with two terminal spines, one in the ventral face and the other in the internal face, and with a small fan-like brush of 5 mini-spines.

Median and hind legs long and slender, about the same length, with the tibia provided with a row of light spinules along the ventral side, with a single termino-ventral spine and with a small brush of mini-spines.

**Abdomen:** Long and slender (Fig. 1), with a circular section all along its length. Each abdominal segment is provided with a pair of hairs in the dorsal side. First abdominal segment with one dorsal process and two lateral ones. In the anterior part of the lateral processes there are three black setae and another one arranged at the top of the hump.

Abdominal gills arranged in branches, as indicated in Table 1. The lateral fringe is very dense in segments 3–7. The lateral tubercles are restricted to the 10th segment. 9th segment (Fig. 8) with an ovoidal tergite uniformly brown. There are two posteromedian dark and long setae arranged outside of the tergite; inside of the tergite there are 8 smaller setae.

Anal prolegs short and massive. Lateral sclerite (sclerite "b" after LEPNEVA 1966), dorsally convex, with a crest of the convexity sharp-grooved. Lateral sclerite with a long seta inserted in the middle and 4 long setae inserted in the posterior margin. The ventral sole plate, or sclerite "c", is yellowish with a black anterior margin, having in its posterior margin a dense inserted tuft of yellow hairs. Anal claw sharply curved, with a small denticle of convex curvature.

**Case:** The larval cases are made with vegetable material, generally stem pieces or woody particles, but also grass leaves, longitudinally fastened together, enclosing a central chamber. Sometimes mineral particles are also included in the ventral side, and others the case is composed partially by a hollowed rush stem.

**Similarities:** Among the different calamoceratid species whose larva is described, there is *Ganonema extensum* MARTYNOV, 1935, which larva is the most similar to the *Calamoceras marsupus* larva. Both species live in temperate climates of Eurasia but in opposite localities: *G. extensum* inhabits the river

Table 1. Number and arrangement of gills in *Calamoceras marsupus* BRAUER.

Segment	Dorsal	Pleural	Ventral
2nd	3	3	4
3rd	3–4	3	4
4th	4	2–3	4
5th	4	2–3	4
6th	3–4	2	3
7th	2–3	2	3

Amur, in Oriental Asia, and *C. marsupus* lives in Western Europe. The main differences between them are: the shape of head capsule, much longer in *C. marsupus*; the length of ventral apotome, which covers most of the ecdysial line in *C. marsupus* and extends over a small region only in *G. extensum*; the submentum sclerites, which are fused in *C. marsupus* and separated in *G. extensum*; the number of dorsal seta on labrum, 30 in *C. marsupus* and 22 in *G. extensum*; and the prosternites, different shaped in both species.

**Habitat:** The larva of *C. marsupus* has been found in a wide range of habitats. In what concerns the substrat types of the bed stream, the larvae were collected from grain, between large pebbles and very coarse sand in rivers Pinhao, Raginha and Tinhela, to silt and lutum in river Tentúgal. Altitude varied from about the sea level in the last case till 700 m in Pinhao river (Barrela Station). The chemical composition of the water also showed significative differences: the sampling points located in the North of the country had an alcalinity, hardness and conductivity comprised respectively between 0.2–0.3 meq/l, 0.2–0.4 meq/l and 38–72 uS/cm, which gives a picture of the low mineralization of those granite rock valleys; here the pH was uniformly acid, between 5.8–6.9. In the Tentúgal station the pH was higher (7.0–7.5) and the conductivity was generally above 150 uS/cm (alluvium soils).

As common characteristics we may mention the relatively fast flowing water and the absence of sources of organic pollution.

**Material:** 15 specimens with body length between 6.5 and 17 mm, collected in the following localities:

- River Pinhao: in Barrela and in Balsa (Septembre, 1983).
- Ribeira da Raginha in Vilar de Macada (June and Septembre, 1983). This is a side-stream of river Pinhao.
- River Tinhela in Murca (Septembre, 1983).
- Ribeira de Tentúgal in Tentúgal (October, 1983).
- River Sordo in Relvas (October, 1982).
- River Genal in Ronda (May, 1984).

### Résumé

La larva de *Calamoceras marsupus* Brauer est décrite. L'existence de 30 setae en rang transversal sur le labrum et la forme du apotome ventral qui couvre la grande parte de la ligne ecdysiale sont considérées les principaux characteristics morphologiques des larves.

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