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Description of the larva of *Eucallia boussingaultii* (GUÉRIN, 1843)
(Coleoptera: Cicindelidae: Cicindelini)

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The last instar larva of *Eucallia boussingaultii* (GUÉRIN, 1843) is described and figured in detail. Larval morphological characters confirm the transfer of the genus *Eucallia* from the tribe Megacephalini to the Cicindelini (subtribe Iresina). The T-shaped gular suture, the pronotum with the distinct semi-circular impressions on the disk, the spines of the first labial palpomere, and the 3 sclerotized hooks on the abdominal tergite V are typical characters of Iresina including *Eucallia*.

Keywords: Cicindelidae, *Eucallia*, larva, taxonomy.

INTRODUCTION

The cicindelid genus *Eucallia* GUÉRIN comprising only one species, *E. boussingaultii*, is distributed from the province of Santander del Norte in northeastern Colombia across Ecuador to the province of Cajamarca in northern Peru. The species inhabits humid mountain forests; adults stay along forest roads on moss covered stones (RODRIGUEZ *et al.*, 1994). Larvae are found on red clay banks with lichens.

Originally, *Eucallia* was placed in the tribe Megacephalini near the genus *Oxycheila* DEJEAN (HORN, 1926). RIVALIER (1971) transferred the genus to the Cicindelini (subtribe Iresina) because of adult characters. Since both tribes are also clearly characterized by larval characters, larval morphology could confirm the present taxonomic position. Moreover, recent studies of the larval morphology strongly suggest that the genus *Oxycheila* should also be transferred to the Cicindelini (Iresina) (PUTCHKOV & ARNDT, in press).

Larval characters of *Eucallia* were already mentioned by GUÉRIN-MÉNEVILLE (1843, 1844) and CHAPUIS & CANDEZE (1853). However, these papers contain only few and superficial details. The larva of *Eucallia* is compared with those of *Cicindela campestris* and *C. hybrida*. Characters which clarify the taxonomical position are not mentioned.

Here, we want to describe the *Eucallia* larva in detail and to discuss the taxonomic position of the genus.

MATERIALS & METHODS

The description is based on the following larval material (all specimens last instar): 4 specimens Ecuador, Loja Prov., Cordillera Cordoncillo, 11 km South of Saraguro, 3130 m; collected by C. YOUNG, R. DAVIDSON, and J. RAWLINS on red clay banks with lichens on October 27, 1987. 22 specimens from the same region, Mamauma, 2650 m, collected by G. ONORE on December 29, 1994. The larvae were col-

lected together with adults. The habitat near Saraguro was unusual because there were hundreds of horizontal burrows in vertical or slightly inclined red clay cliffs that varied from 3 to 10 metres in height, mostly covered with lichens (R. D. DAVIDSON, pers. commun.). Only 6 adults of *E. boussingaultii* but no other cicindelid species were found in the area, so doubtless the larvae belong to this species.

Larvae of 25 further Cicindelidae genera (including all tribes) were available for comparison (PUTCHKOV & ARNDT, 1994). The larvae of *E. boussingaultii* are deposited at the Carnegie Museum of Natural History, Pittsburgh, in the collection of Pontificia Universidad Catolica of Quito and (single specimens) in the collections of the authors.

The nomenclature follows RIVALIER (1971); terms of morphology and chaetotaxy follow KNISLEY & PEARSON (1984).

DESCRIPTION OF THE LAST INSTAR LARVA

Measurements: Head width 2.92–3.33 (av. 3.20) mm; frontal width 1.74–2.04 (av. 1.92) mm; pronotal width 3.25–3.74 (av. 3.52) mm; pronotal length 2.03–2.33 (av. 2.19) mm, n = 15.

Coloration: Head blackish brown, pronotum dark brown with discal area darker than sides, rest of sclerites paler brown.

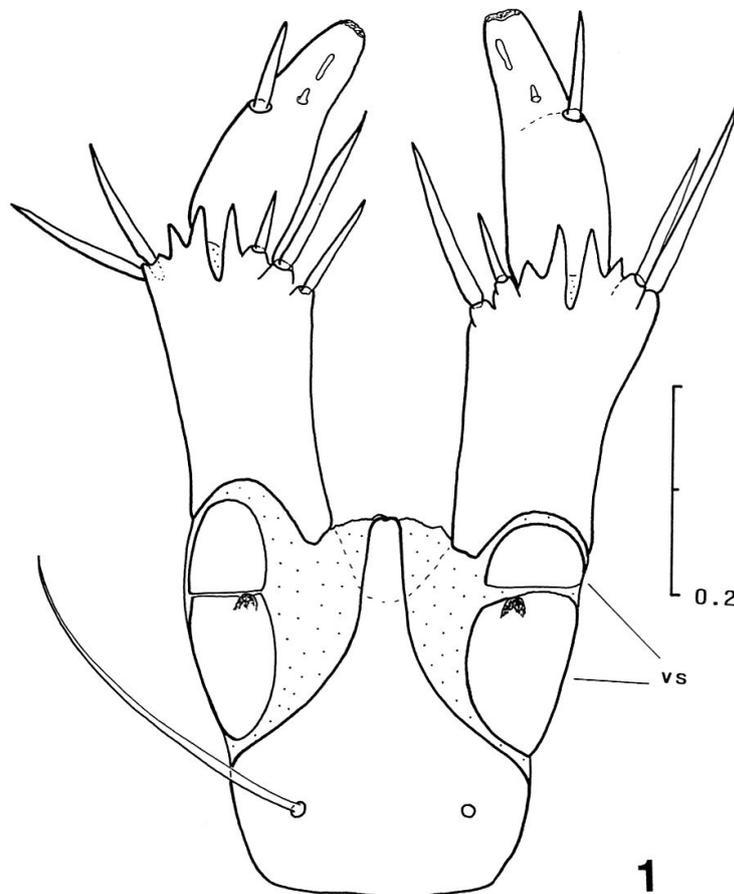


Fig. 1. *Eucallia boussingaultii*: Prementum and labium, ventral aspect; vs – ventral double sclerite.

Head: Six stemmata of characteristic size and position (see KNISLEY & PEARSON, 1984). Small tubercles, each with 2 long setae, are near the large stemmata I and II. The rest of the setae without or with indistinct tubercles; most setae of the head capsule thin, not flattened; some lateral setae near the eyes slightly flattened. Coronal suture very short, indistinct. Ridge on the posterodorsal part of the parietale weakly separated from the slightly U-shaped ridge of the posterior part of the frontale. Nasale produced, wide, anterior margin nearly straight, terminating in 2 large teeth at the sides. Antenna 4-segmented; antennomeres I–III of nearly the same length, last antennomere 1.4 times shorter and thinner than the other segments; antennomere I with 4–5 setae, 3 of them subapical on outer margin, antennomere II with 4 setae, antennomere III with 2 large setae; sensorial appendage of antennomere III lacking, replaced by a group of very small setae. Maxilla with 2-segmented cardo, dorsal part of cardo slender and ring-shaped, ventral part triangular with 1 seta, stipes slender with 2–3 spikes and a small group of short setae mediobasally; setal group gMX on inner side of stipes situated in a less sclerotized field with 24–28 setae in two rows, setae of the inner row long, those of the lateral row short. Lacinia lacking, between stipes and maxillary palpus a sclerotized segment with 3 setae present; palpus and galea of about equal length or palpus slightly shorter, first segments of palpomere and galea fused, galeomere I with 3 typical setae on inner margin, galeomere II with 4 strong bristles. Hypopharynx of typical structure, large, overlapping the prementum, dorsally densely covered with small hairs, laterally and ventrally with numerous long setae. Labium (Fig. 1) with a longish oval double sclerite on the ventral side between prementum and labial palpomere I; labial palpomere I with 4–5 strong setae and 3–4 spines apically, palpomere II with 1 strong bristle ventrally near middle.

Thorax: Pronotum (Fig. 2) with distinct relief-like structures, anteriorly with distinct semicircular impressions; anterolateral angles sharp, triangular; 16–24 setae

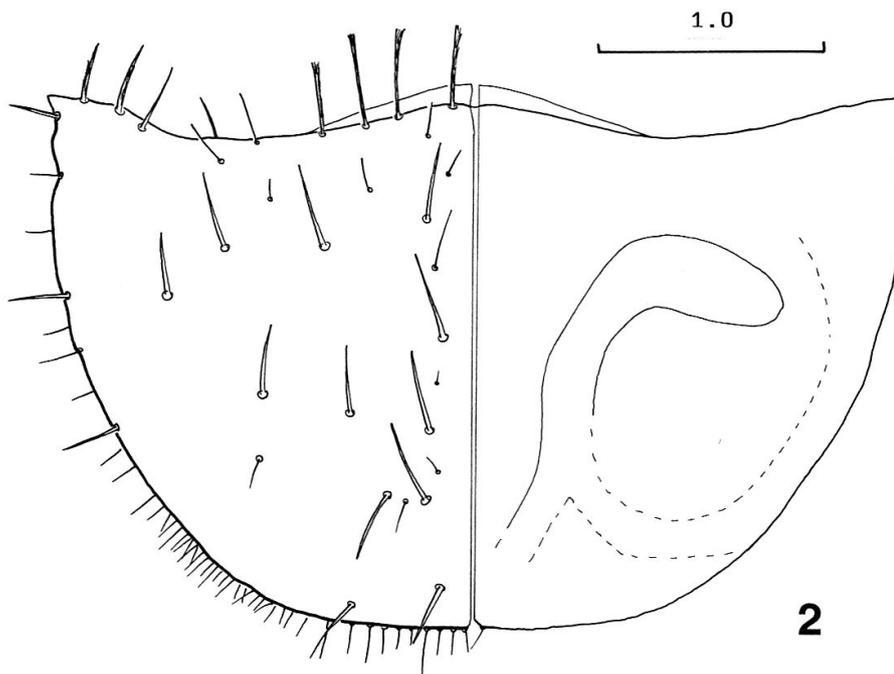


Fig. 2. Pronotum.

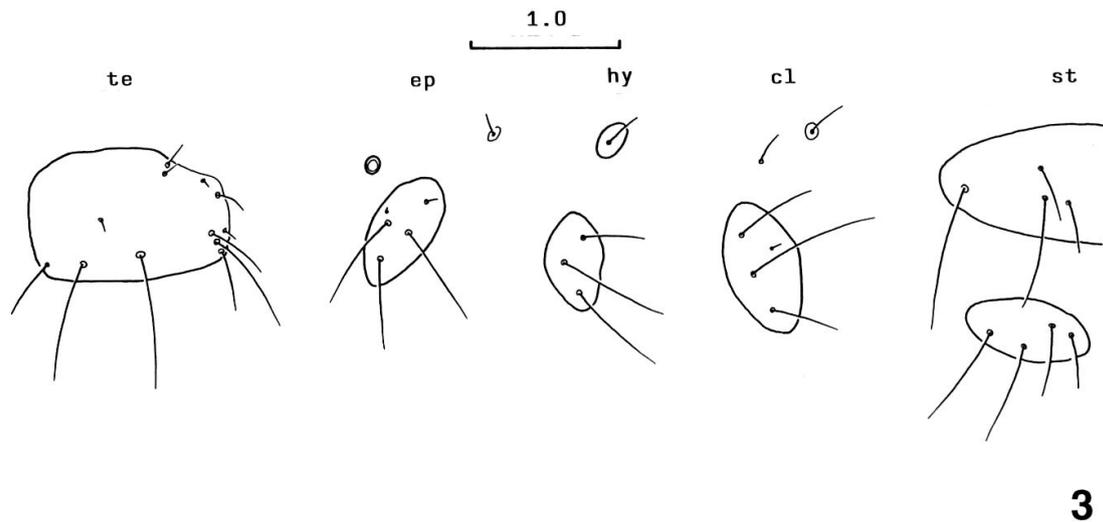


Fig. 3. Sclerites of abdominal segment III, right side; cl – coxal lobe (= laterosternite), ep – epipleuron, hy – hypopleuron, st – sternites, te – tergite.

on each pronotal half, 6–10 setae along median suture. Ridges of anterolateral angles weakly defined. Legs 5-segmented of typical cicindeloid shape, each with two separated claws, the anterior one longer.

Abdomen: Abdominal tergites I–IV with about 7 long and 6 very short and thin setae. Hypopleuron consisting of 1 large and 1 small sclerite (Fig. 3). Abdominal tergite V with anterior part separated, caudolateral and caudal parts fused; anterior part with 8–10 long setae, lateral part with 4–6 setae, the first of which inserts on the outer margin of the lateral hook, caudal part of tergite with 12–15 strong setae; 3 pairs of hooks present, median and inner hook comparatively straight and slender, each with 1–2 setae medially, median hook slightly curved outside, inner hook with 2 setae in its middle part (Fig. 4). Tergite IX with 7 pairs of long setae, pygopod conical, with 5–7 pairs of setae dorsally and dorsolaterally, apical margin of pygopod with 16–20 setae, 12 of them visible from dorsal side, ventral part without setae. Sternite IX with 6, rarely 7 long setae on posterior margin.

DISCUSSION

Larval characters clearly show that the genus *Eucallia* is a representative of the Cicindelini. Typical character states of Cicindelini larvae are the T-shaped anterior end of the gular suture, the pronotum with the distinct semicircular impressions on disk, the presence of spines on the first labial palpomere, and the shape of the hooks of the abdominal segment V (PUTCHKOV & ARNDT, 1994).

In the tribe Cicindelini, the genus *Eucallia* belongs to the Iresina group as proposed by RIVALIER (1971), because of the 3 pairs of hooks on the abdominal tergite V. The larva is similar to that of genus *Euprosopus* DEJEAN, which is distinguished by the large number of flattened setae on the pronotum, fewer setae on the pygopod and abdominal tergites, and a longer coronal suture. The larva of *Eucallia* is distinguished from that of *Oxycheila* DEJEAN (see ARNDT & PUTCHKOV, in press) by the lack of a dorsoapical spine on the first freestanding maxillary palpomere (palpomere I according to VAN EMDEN (1935) who considered the first segment as pal-

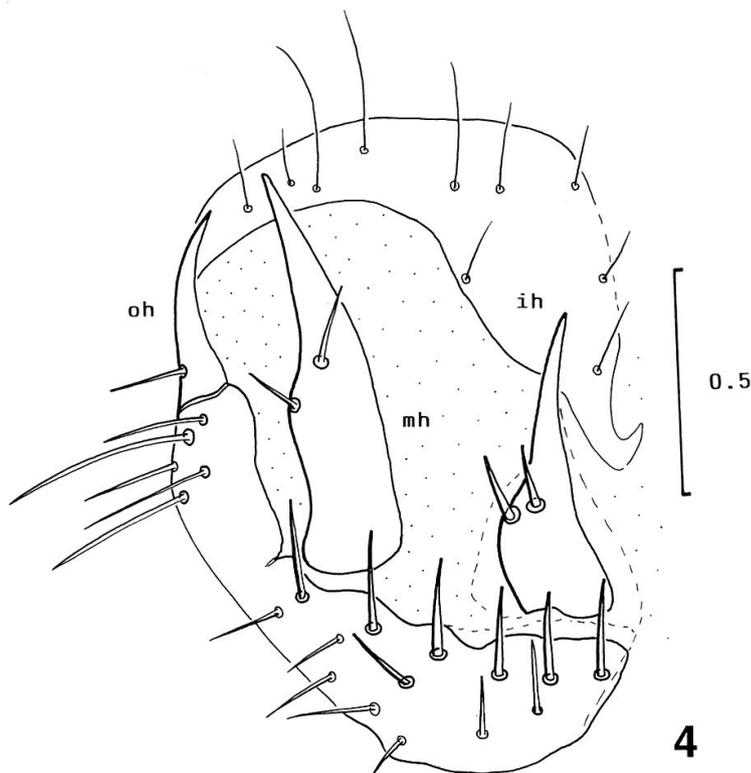


Fig. 4. Tergites and hooks of abdominal segment V, left side; ih – inner hook, mh – median hook, oh – outer hook.

pifer) and large numbers of stout setae on the pygopod. Furthermore, the third instar larva of *Oxycheila* has 3–6 bristles on the median hook, contrary to *Eucallia* with only two bristles on each hook. However, the 2nd instar larva of *Oxycheila* is very similar to *Eucallia* besides the very small spine on the maxillary palpomere. Larvae of *Eucallia* and *Oxycheila* share the form of the ridges on the posterior part of the head, and the very short coronal suture. In our opinion, these character states confirm the close relationship of these genera, and both should be included in the subtribe Iresina.

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ZUSAMMENFASSUNG

Die Larve von *Eucallia boussingaultii* (GUÉRIN, 1843) wird beschrieben und abgebildet. Larvalmorphologische Merkmale bestätigen die Umstellung der Gattung *Eucallia* von den Megacephalini in die Cicindelini (Subtribus Iresina). Die T-förmige Gularsuture, halbkreisförmige Eindrücke am Pronotum, Stacheln am ersten Labialpalpenglied und drei Paare sklerotisierter Haken am Abdominaltergit V sind typische Merkmale der Iresina (einschließlich *Eucallia*).

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