

# Papéis Avulsos de Zoologia

## STUDIES ON ELATERIDAE (COLEOPTERA). BIOLOGICAL NOTES ON NEOTROPICAL LARVAE

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### INTRODUCTION

Miscellaneous biological notes on larvae of Neotropical Agrypninae and Elaterinae have been assembled by collecting and rearing over a number of years. In spite of the considerable amount of data on elaterid larvae, little is known about them in the Neotropical Region. Studies of immature stages are very important from the systematic point of view or for the establishment of relationships between the groups and their evolution.

The following genera and species are herein studied: Agrypninae: *Dilobitarsus quadrituberculatus* Candèze, 1857; Elaterinae: Dicropodiini: *Ischiodontus brasilianus* Germar, 1824, *I. nigrita* Candèze, 1859, *I. obscurus* Candèze, 1859, *I. puncticollis* Fabricius, 1801, *Crepidius flabellifer* (Erichson, 1847); Megapenthini: *Megapenthes brasilianus* Candèze, 1881; Physorhinini: *Physorhinus erythrocephalus* Fabricius, 1801 and *P. xanthocephalus* Germar, 1840.

Drawings were made from the last exuviae. Photographs were taken by Giro Pastore.

My best thanks are due to the colleagues who provided some of the larvae.

All larvae were collected in rotten wood, many being developed. They were placed in individual Petri dishes, with pieces of rotten wood on wet sand. The larva of *Dilobitarsus* was fed with larvae of *Tenebrio*. Larvae of Dicropodiini are probably predaceous, but refused all kinds of larvae offered; once I have observed cannibalism between larvae of *Ischiodontus*.

### SUBFAMILY AGRYPNINAE

This subfamily contains about 12 genera and 900 species (Hayek, 1973). Larvae of 4 genera and 10 species are known but up to now nothing was known about larvae of the Neotropical Region.

**Dilobitarsus quadrituberculatus** Candèze, 1857

(Figs. 1-6 and 47-48)

One well-developed larva was collected at Minas Gerais, Santa Bárbara (Serra do Caraça), 6.III.1972 by U. R. Martins.

This larva is closely related to that of *Lacon parallelus* (Lewis, 1894), described by Ohira (1962), differing in the number of tubercles and setae of the 9th abdominal segment and also by the general number and position of the setae on the body, especially those of the head and mouthparts.

**MATURE LARVA**

Body surface yellowish; head, pronotum and prosternum darker. Head and body dorsoventrally compressed. Head slightly rounded laterally. Cranial sutures widely separated in front, converging behind. Antennae (fig. 3) 3-segmented, second segment with two pairs of setae and with a small triangular sensory appendix; third segment, the smallest, with one long hair-like seta apically. Nasale (fig. 4) tridentate, with three setae between adjacent teeth. Mandibles (fig. 2) arcuate and stout, without retinaculum, penicillum formed by a small tuft of short and thin hairs. Maxilla (fig. 5) with elongate stipites, which are very close at the base; cardo reduced. Pronotum as long as the meso- and the metanotum together. Coxae separated. Legs with several stout setae, associated with long hairs. Prosternum triangular, with a pair of median basal setae and several setae anteriorly. Ninth abdominal tergite (fig. 1) slightly concave, with five pairs of lateral tubercles diminishing in length from the tip to the base, the apical tubercle bifurcate, all of these tubercles with several hairy points; surface of tergite with five small hairy tubercles. Tenth abdominal segment (fig. 1) of moderate size, tubular and with two stout spines on the lateral margin of the anal region.

**PUPA (figs. 47-48)**

Sides of pronotum with three pairs of cuticular prolongations, one on the anterior margin, one on the posterior angles and the last on the basal region. Last abdominal segment with one pair of urogomphi with small lateral ramifications.

**SUBFAMILY ELATERINAE**

This subfamily contains about 52 genera and 1000 species.

Gurjeva (1974) has considered 7 tribes in the Elaterinae: Phororhinini, Megapenthini, Ampedini, Elaterini, Melanotini, Agriotini and Dicrepidini. Up to now larvae from the Holarctic and Oriental Regions belonging to at least five of these tribes were known, but none from the Neotropics.

Hyslop (1917) characterized the larvae of this subfamily as: "cylindrical or subcylindrical in general form, the ninth abdominal

segment never emarginate and the pleural areas always concealed or decidedly reduced." He studied larvae of five tribes. Ohira (1962) characterized several larvae of Elaterinae from Japan.

I have tried to compare the Neotropical larvae here described with those of the Holartic and Oriental Regions.

#### TRIBE DICREPIDIINI

The larva of *Ischiodontus simplex* Leconte, 1853 was figured by Hyslop (1917). It is closely related to *Ischiodontus brasilianus* Germar, 1824 and *Crepidius flabellifer* (Erichson, 1847) in the form of the muscular impressions of the abdominal tergites.

#### *Ischiodontus brasilianus* Germar, 1824

(Figs. 9-14, 17-19)

This species is very common in the forests near São Paulo. I have been able to follow metamorphosis of 4 larvae, 3 from São Paulo, Salesópolis (Estação Biológica de Boracéia) and 1 from São Paulo, Caraguatatuba.

#### MATURE LARVA

Cylindric, reddish-brown. Abdominal segments with punctures large and homogenous, abdominal tergites with muscular impressions conspicuous and oblique in relation to anterior margin. Antenna (fig. 12) fitted perfectly in a groove on the dorsal part of the mandibles, 3-segmented, sensory appendix well developed, third segment minute. Nasale (fig. 14) tridentate, the median teeth greater than the others. Mandible (figs. 10-13) with retinaculum and penicillum conspicuous; dorsal region with peculiar grooves to receive the antenna. Maxilla (fig. 9) with elongate stipites, separated at the base; cardo well developed. Leg (fig. 19) with stout and short setae associated with a few long hairs. Ninth abdominal tergite not emarginated with the tip bluntly pointed and punctuation stronger than on the other tergites.

#### *Ischiodontus nigrita* Candèze, 1859

(Figs. 20-21)

Larva collected at São Paulo, SP, 20. VII. 1965 by C. Costa.

Very closely related to *I. brasilianus*, differing in the finer general punctures; muscular impressions of abdominal segment not striate and parallel to the anterior margin; 9th tergite abruptly pointed, with several small tubercles on the lateral and dorsal regions.

#### *Ischiodontus obscurus* Candèze, 1859

(Figs. 6-8)

Larva collected at São Paulo, Km 26 Rodovia Raposo Tavares, 18. I. 1973, by C. Costa.

Very close to *I. nigrita*, differing in the dark-brown general color; muscular impressions of the abdominal segments denser; 9th tergite with a few small lateral tubercles and dorsal surface heterogeneously punctulate, i.e., fine punctures associated with a few larger and impressed ones.

***Ischiodontus puncticollis* Fabricius, 1801**

(Figs. 15-16)

I have been able to follow metamorphosis of two larvae of *I. puncticollis*, one collected at São Paulo, Tabatinga (Fazenda Itaquere), 21.VI.1965, by K. Lenko; the other at São Paulo, Salesópolis (Estação Biológica de Boracéia), 24.IX.1969, by C. Costa.

Very closely related to *I. brasilianus*, differing in the muscular impressions of the abdominal segments and the punctuation of the abdominal sternites which are much less impressed.

***Crepidius flabellifer* (Erichson, 1847)**

(Figs. 22-23)

Larva collected at São Paulo, SP, 14.X.1975, by C. Costa.

Very closely related to *Ischiodontus brasilianus* differing in the punctures of the abdominal sternites which are finer and by the 9th tergite with several small tubercles associated to some very large punctures.

**TRIBE MEGAPENTHINI**

This tribe contains about 10 genera. The genus *Megapenthes* includes about 196 species, 21 of which from the Neotropical Region. Nothing was known about the larvae of this tribe.

***Megapenthes brasilianus* Candèze, 1881**

(Figs. 24-31)

Larva collected at São Paulo, São José do Rio Preto, 19-23.VII.1965, by C. Costa.

Cylindric, yellowish. Abdominal tergites with shallow, homogenous punctures. Antenna (fig. 28) fitted perfectly in a groove on the dorsal part of the mandibles, 3-segmented, third segment minute and with three short apical setae, sensory appendix well developed. Nasale (fig. 24) unidentate, two pairs of setae on each side. Mandibles (figs. 30-31), dorsal region with peculiar grooves to receive the antennae, with retinaculum and penicillum absent. Maxilla (fig. 26) with elongate stipites, which are separated at the base; cardo well developed. Leg (fig. 25) with a few stout and short setae and long hairs. Ninth tergite not emarginate, its tip bluntly 3-pointed, dorsal surface with 4 impressions.

## TRIBE PHYSORHININI

This tribe contains about 4 genera and 170 species. The larva of *Anchastus aquilus* Candèze, 1873 was described by Ohira (1962). Nothing was known about the *Physorhinus* larvae.

Comparing the larvae of *Physorhinus* with that of *Anchastus* I have observed the same type of antenna and a greater or lesser variation of the remaining characters.

**Physorhinus erythrocephalus** Germar, 1840

(Figs. 32-42 and 45-46)

Larva collected at Rondônia, Guajará-Mirim, near Cabixi River, 15-17.IV.1976, by S. A. Vanin.

Cylindric, reddish-brown. Abdominal tergites with well impressed punctures of variable size, localized mainly on the median region, abdominal sternites finely punctured. Antenna (fig. 33) 3-segmented, first segment with one latero-apical seta, third segment minute and sensorial appendix absent. Nasale (fig. 32) unidentate, with dorsal part adapted to receive the antennae, with retinaculum and penicillum formed by thin hairs. Maxilla (fig. 34) with elongate stipes; cardo conspicuous. Leg (fig. 36) with stout lanceolate setae and a few long hairs. Ninth tergite with 4 small tubercles on the median region, the entire surface covered by variable well impressed punctures, its tip crenulate and with one pair of lateral tubercles near apex.

PUPA (figs. 45-46)

Covered with thin and dense hairs, posterior angles of pronotum with one recurved cuticular prolongation. Last abdominal segment with two pairs of densely hairy urogomphi.

**Physorhinus xanthocephalus** Germar, 1840

(Figs. 43-44)

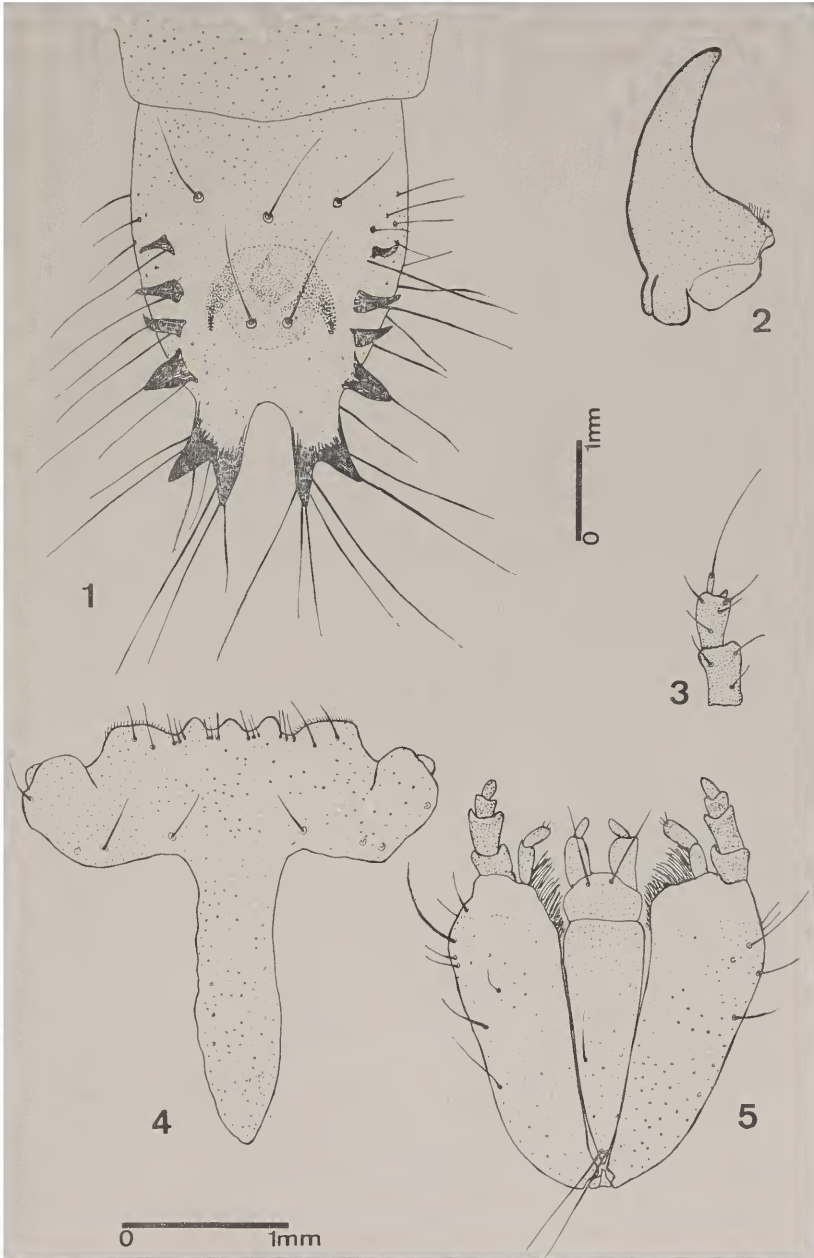
Larva collected at São Paulo, Salesópolis (Casa Grande), 1.XI. 1975, by M. G. Lima.

Very closely related to *P. erythrocephalus*, differing by the homogeneous punctures of the abdominal tergites, and 9th tergite with two small dorsal tubercles and the apex with two rows of small denticles.

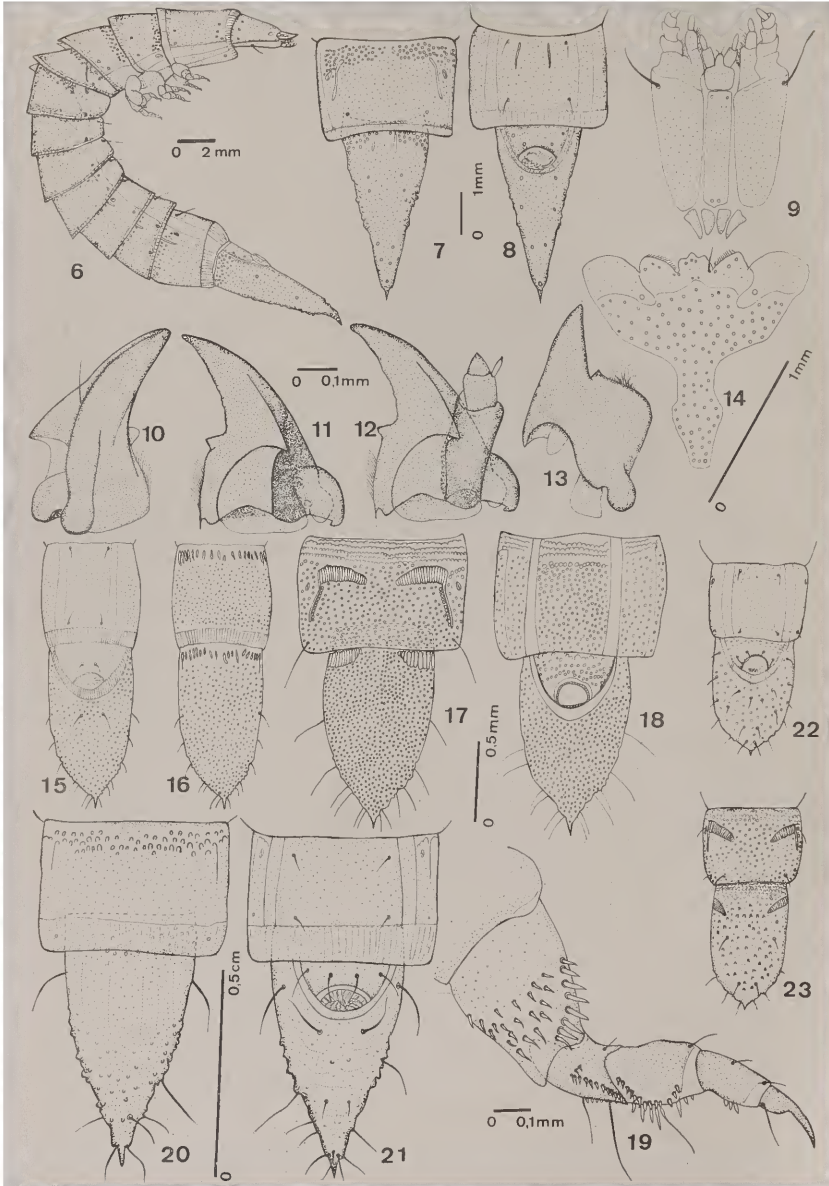
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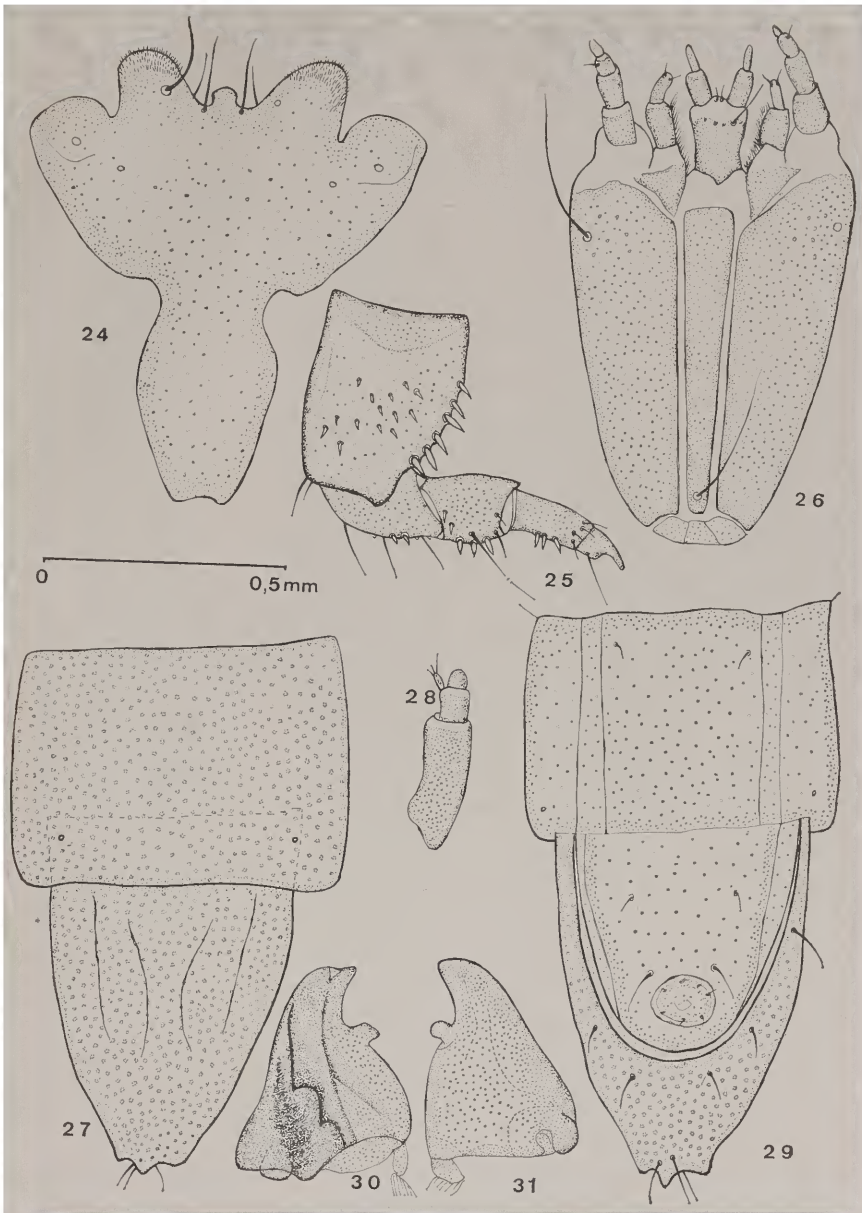


*Dilobitarsus quadrituberculatus*: 1, abdominal segments 9-10; 2, mandible; 3, antenna; 4, front and nasale; 5, hypostoma.

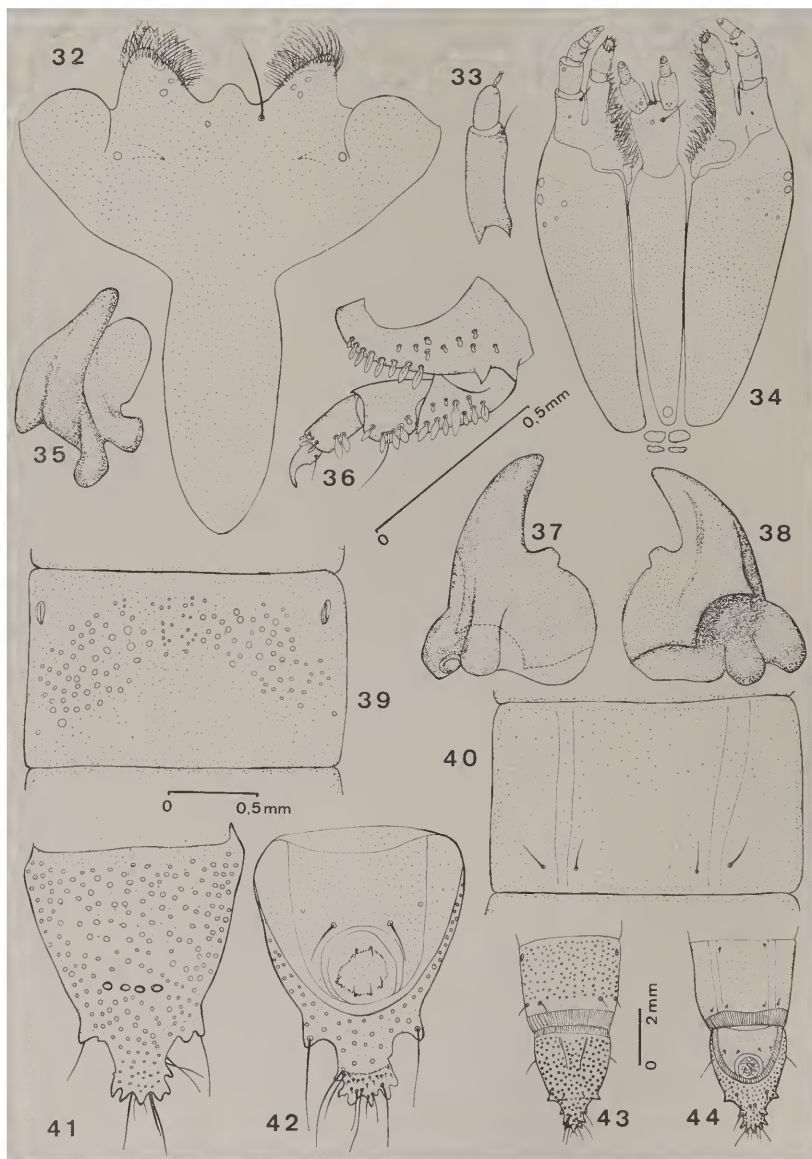


*Ischiodontus obscurus*: 6, general lateral view; 7, tergites 8-9; 8, abdominal sternites 8-10. *I. brasilianus*: 9, hypostoma; 10, mandible (ventral view); 11-12, mandible (dorsal view); 13, mandible (apical view); 14, front and nasale; 17, abdominal tergites 8-9; 18, abdominal sternites 8-10; 19, leg. *I. puncticollis*: 15, abdominal sternites 8-10; 16, abdominal tergites 8-9. *I. nigrita*: 20, tergites 8-9; 21, abdominal sternites 8-10. *Crepidius flabelifer*: 22, abdominal sternites 8-10; 23, abdominal tergites 8-9.

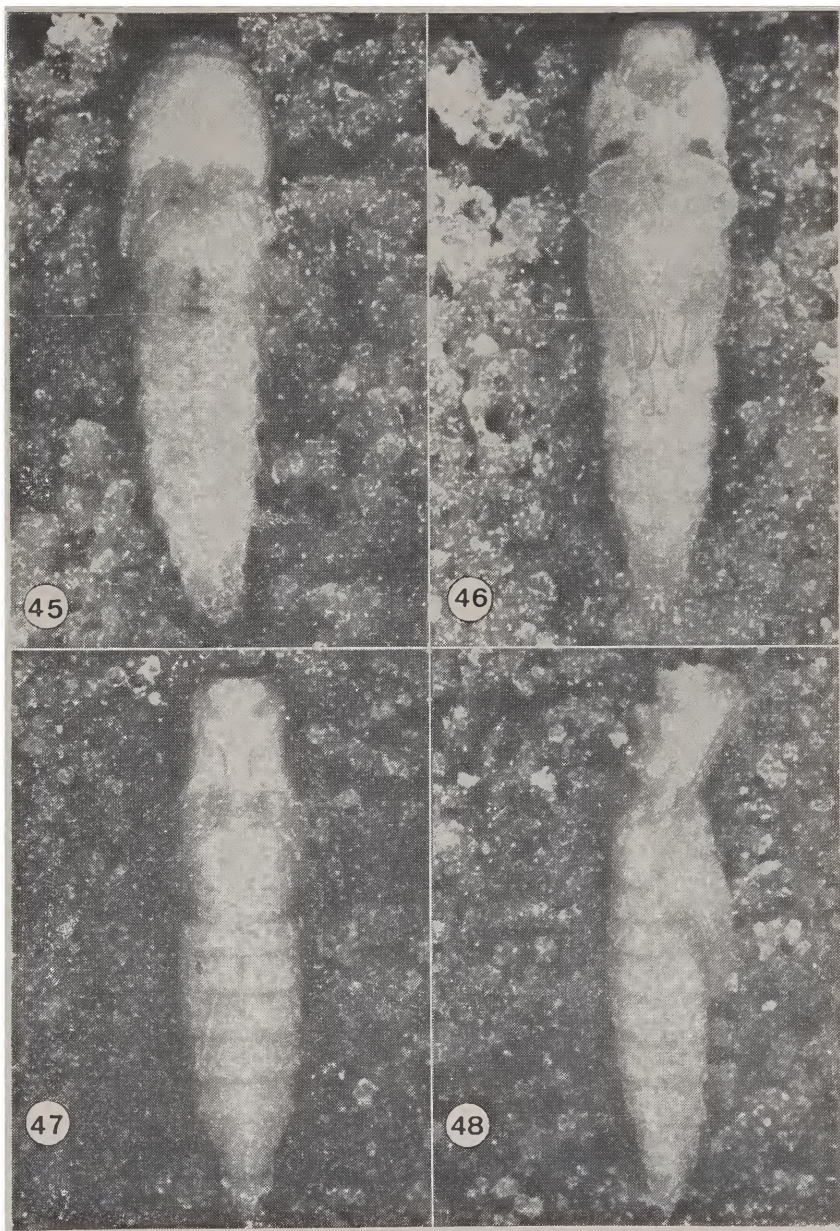




*Megapenthes brasilianus*: 24, front and nasale; 25, leg; 26, hypostoma; 27, abdominal tergites 8-9; 28, antenna; 29, abdominal sternites 8-10; 30, mandible (dorsal view); 31, mandible (ventral view).



*Physorhinus erythrocephalus*: 32, front and nasale; 33, antenna; 34, hypostoma; 35, mandible (apical view); 36, leg; 37, mandible (ventral view); 38, mandible (dorsal view); 39, tergite 7; 40, sternite 7; 41, tergite 9; 42, sternites 9-10. *P. xanthocephalus*: 43, tergites 8-9; 44, sternites 8-10.



Pupae. *Physorhinus erythrocephalus*: 45, dorsal view; 46, ventral view.  
*Dilobitarsus quadrituberculatus*: 47, dorsal view; 48, lateral view.

Species	Locality	Date Collector	Pupa	Adult sex
<i>Dilobitarsus quadrituberculatus</i>	Serra do Caraça Sta.Barbara, MG	6.III.1972 U.R. Martins	-	♂ -
<i>Ischiodontus brasilianus</i>	Estação Biológica Boracéia, Salesópolis, SP	16-19.VIII.66 C. Costa	-	♀ -
		27.XI.1969 C. Costa	27.I.1970	♀ 3.II.1970
		12.XI.1970 C. Costa	11.XI.1970	♂ 14.XII.70
	Caraguatatuba S. Paulo	28.VII.1965 K. Lenko	22.X.1965	o 8.XI.1965
<i>Ischiodontus nigrita</i>	Ipiranga S.Paulo, SP	20.VIII.1965 C. Costa	-	♀ -
<i>Ischiodontus obscurus</i>	Km 26 Rodovia Raposo Tavares S. Paulo	18.I.1973 C. Costa	-	♂ -
<i>Ischiodontus puncticaollis</i>	Tabatinga Faz. Itaquere	21.VI.1965 K. Lenko	18.X.1965	♂ 25.X.1965
	Estação Biológica Boracéia, Salesópolis, SP	24.IX.1969 C. Costa	25.IX.1969	♂ 21.X.1969
<i>Crepidius flabellifer</i>	Parque da Água Funda, S.Paulo	14.X.1975 C. Costa	-	♂ -
<i>Megapenthes brasilianus</i>	S. José Rio Preto, S. Paulo	19-23.VII.65 C. Costa	25.X.1965	♀ 8.XI.1965
<i>Physorhinus erythrocephalus</i>	Guajarã Mirim Rio Cabixi, RO	15-17.IV.1976 S.A. Vanin	30.V.1976	♀ 16.VI.76
<i>Physorhinus xanthocephalus</i>	Casa Grande Salesópolis, SP	1.XI.1965 M.G. Lima	-	♂ -