

THE IMMATURE STAGES OF *Paramallocera hirta* KIRBY, 1818 (COLEOPTERA: CERAMBYCIDAE: ELAPHIDIONINI)

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ABSTRACT

Last instar larva and pupa of *Paramallocera hirta* Kirby, 1818 are described and illustrated based on specimens reared in the laboratory from neonate larvae on *Eucalyptus globulus ssp. globulus* logs and on an artificial diet. Characteristics of possible diagnostic value are also presented in this paper.

Keywords: Coleoptera, Cerambycidae, Elaphidionini, *Paramallocera*, larva, pupa, taxonomy, morphology, Uruguay.

RESUMO

Estágios imaturos de *Paramallocera hirta* Kirby, 1818

Neste trabalho, se descrevem a larva do último instar e a pupa do *Paramallocera hirta* Kirby, 1818, com base em espécimes criados em laboratório a partir de larvas neonatas em toras de *Eucalyptus globulus ssp. globulus* e com uma dieta artificial. Apresentam-se, também, características com possível valor diagnóstico.

Palavras-chave: Coleoptera, Cerambycidae, Elaphidionini, *Paramallocera*, larva, pupa, taxonomia, morfologia, Uruguai.

INTRODUCTION

Paramallocera hirta is a native cerambycid which was first detected attacking *Scutia buxifolia* Reissek (Rhamnaceae) “coronilla” in 1941, and was recently found attacking *Eucalyptus grandis* W. Hill ex Maiden in Tacuarembó and Rivera Departments (Uruguay). This beetle was also found to cause damage in *E. globulus* Labillardiere *ssp. globulus* Kirk in Lavalleja Department (Zajciw & Ruffinelli, 1962; Ruffinelli, 1967; Monné, 1970; Monné *et al.*, 2002). In Brazil, this species was detected on branches and logs of *Eucalyptus spp.* L' Herit (Myrtaceae) (Moraes & Berti Filho, 1974; Berti Filho, 1985). Females generally lay isolated eggs on the bark surface. Neonate larvae burrow

through the bark and begin to feed subcortically. As they develop, the larvae burrow wider, deeper and irregular galleries. Mature larvae are approximately 21 mm in length, with an elongated subcylindrical shape, a milky white tegument and head deeply invaginated into the prothorax. The upper third of the pronotum presents bands of ferruginous setae; the abdomen is extended, having dorsally and ventrally whitish glabrous ampullae. The mature larvae bore obliquely into the xylem, where they pupate at a depth of several centimeters from the surface. Pupa exarate with milky white tegument, ventrally glabrous, dorsal surface of the prothorax and abdominal segments have spiniform setae. Finally, the adult emerges from a hole it bores through the bark.

This study contributes to the body of knowledge about a group of boring larvae that attack *Eucalyptus spp.* in Uruguay.

MATERIAL AND METHODS

P. hirta was reared in the laboratory on *E. globulus ssp. globulus* logs. Neonate larvae were inoculated on logs, which were kept in an environmentally controlled chamber ($25 \pm 2^\circ\text{C}$, photoperiod 12:12 h. L:D) to obtain mature larvae. The pupal stage was very difficult to obtain following this method, so some neonate larvae were reared on a modified artificial diet (Iglesias *et al.*, 1989; Bianchi *et al.*, 2003).

The characteristics used to describe mature larva and pupa were based on Duffy (1960); Pentead-Dias (1982); Costa *et al.* (1988) and Stehr (1991).

RESULTS

Description of the last instar larva (Figs. 1-11)

Extended body with parallel borders and milky white tegument (Fig. 1). Total length 21 ± 1.5 mm, $n = 8$. Head in dorsal view rather broad (Fig. 2). Maximum head width 4.38 ± 0.2 mm $n = 8$. Front margin shorter and rather sinuous, with long slender light brown setae, with 4 very long conspicuous central setae, two on each side of the median suture. Epicraneal area smooth, front region regular with white, coarse, slightly transversal area, with a clear dark brown band bearing a row of median setae. Antennae with 3 segments. Under the antennae there are 2 ventral-lateral ocelli on each side. Clypeus narrow and light brown. Labrum (Fig. 4) quadrangular with round external margin, with a row of long setae, 4 – 6 short thick setae in the central area; tegument transversally and slightly striated, with abundant striation on anterior 2/3.

Epipharynx (Fig. 5) with a group of 12-14 very long thin setae which extend from the middle of the epipharynx to the external margin. Hypostoma (Fig. 3) laterally and slightly striated, anterior and lateral margins ferruginous brown and weakly sclerotized. Mandible (Figs. 9, 10) symmetric, massive, cuneiform with broad base; 6 slender external setae developed at the base of the mandible; incisive region very strong, broad with

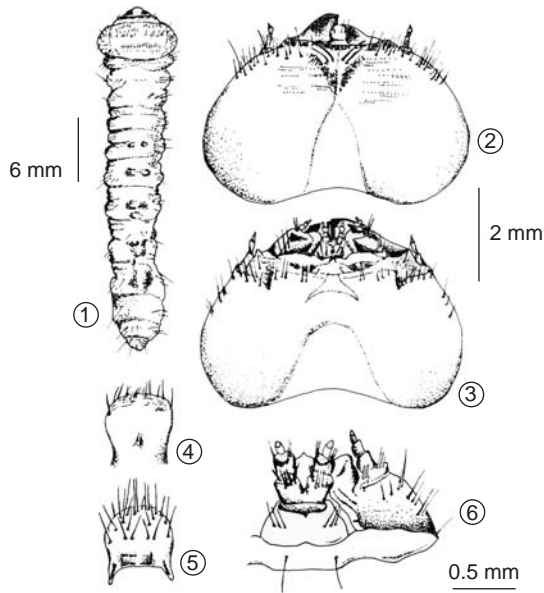
sharp edges; molar region with smooth border and large rough surface that arises on the incisive molar edge. Maxilla (Fig. 8) with transversal cardo and stipe very broad and setose. Maxillar trapezoidal lobe with a row of long setae on the upper border. Labium (Fig. 6) with mentum broad and short, with 3 ventral setae on each side, submentum setose. Labial palpi bi-segmented, pubescent and the last palp thinner and longer than the other. Prothorax more conspicuous than the other thoracic segments. Pronotum (Fig. 7) width 7.5 mm and length 2.5 mm, with round margins. Upper and lateral margins pubescent. Anterior setae of the pronotum short and arranged in 1 or 2 intercalated rows, setae of the lateral margins longer and scattered. These setose areas are located in regions where the tegument is light brown, but interrupted by characteristic discolored areas and they are followed by a broad band of large setae. Abdomen with ten segments, quadrangular, sub-equal with irregular margins. General abdominal chaetotaxy slight and long. Ampullae whitish, glabrous, rugged and irregularly located dorsally on segments III-VII and ventrally on segments III-VIII. Spiracles with peritreme thin, pale and broadly oval; mesothoracic spiracle larger than the abdominal ones; abdominal spiracles present on segments I-VIII. Last segment smaller, semi-quadrangular with 3 very long, conspicuous brown setae located at each side (Fig. 11).

Description of the pupa (Figs. 12, 13)

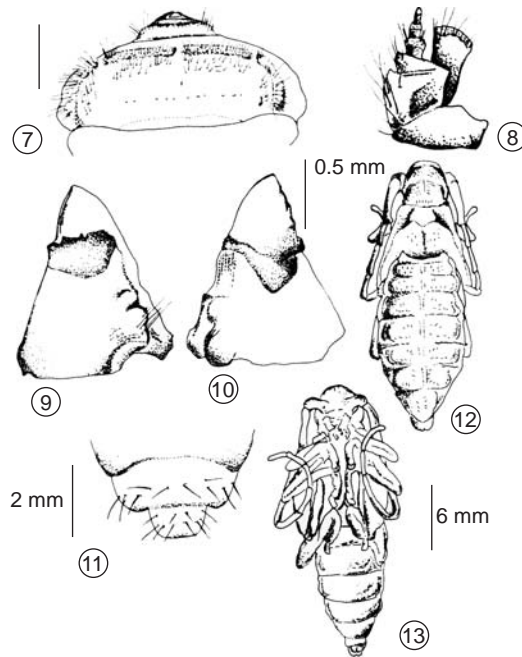
Pupa exarate, milky white. Total length about 20 mm. Pronotum quadrangular, maximum width 4.0 mm and maximum length 4.9 mm; tegument transversally striated with two important lateral tubercles. Central region of the metanotum with a group of 6-8 spiniform setae. Mesothoracic podotecas protected behind the pterotecas. Dorsal surface of the I-VI segments with distinctive short spiniform setae arranged in a C-shaped line and dorsal surface of the segments VII-VIII with irregularly distributed spiniform setae. Surface of the ventral tegument glabrous (Fig. 13).

DISCUSSION

The Elaphidionini is one of the most generically diverse tribes in the family and ranges from Canada to South America and the West Indies. This group has had a long, confusing taxonomic



Figs. 1-6 — *Paramallocera hirta*: 1) larva, dorsal view; 2) head, dorsal view; 3) head, ventral view; 4) Labrum; 5) epipharynx; and 6) Labium, ventral view and left maxilla.



Figs. 7-13 — *Paramallocera hirta*: 7) Pronotum; 8) left maxilla, dorsal view; 9) Mandible, dorsal view; 10) Mandible, ventral view; 11) Last abdominal segments, ventral view; 12) pupa, dorsal view; and 13) pupa, ventral view. Scale line in mm.

history, and generic concepts and identity have been unstable (Lingafalter, 1997).

Knowledge about the ontogeny of the *Paramallocera* species is equally scarce (Fonseca-

Gessner, 1990). Thus, the number and location of the larval abdominal ampullae, ocellar design and pupa chaetotaxy described here are features that may help to characterize the genus. Table 1 compares

TABLE 1
Larval and pupal anatomical characteristics of *Phoracantha recurva*, *Phoracantha semipunctata*, *Eurymerus eburioides* and *Paramallocera hirta*.

Larval charact.	Cerambycid species			
	<i>P. recurva</i>	<i>P. semipunctata</i>	<i>E. eburioides</i>	<i>P. hirta</i>
Supraocelar chaetotaxy	5 setae	7 setae	8 setae	12-14 setae
Ocelli	single	single	single	Double
Abdominal ampullae	absent	absent	absent	Present
Distinctive setae on segment X	4 slender setae	2 setae	24-28 setae	6 setae

Pupa characteristics				
Abdominal dorsal chaetotaxy	I-IV irregular rows of spinifor setae. V-VIII single row.	I-III irregular rows of spinifor setae. IV-V pair of irregular rows. VI-VIII single row.	Irregular rows of spinifor setae on segments I-VII	I-VI spiniform setae on a C-shaped line. VII-VIII spiniform setae irregularly distributed

the main larval and pupal characteristics of 3 other species of cerambycids that attack *Eucalyptus* in Uruguay (Morelli *et al.*, 2002; Morelli *et al.*, in press) with *P. hirta*.

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