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LARVAE OF NEOTROPICAL COLEOPTERA. III: SCARABAEIDAE, RUTELINAE

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ABSTRACT

The third instar larva and the pupa of Macraspis cincta (Drury, 1782) are described and illustrated. Larvae were collected from decayed logs in southern Brazil (São Paulo and Santa Catarina). Larvae reared to adults made possible the identification. A comparison with M. dichroa cribata Waterhouse, 1881, the only previously described larva of the genus Macraspis, is given.

INTRODUCTION

Larvae of Scarabaeidae in general are very well known, specially that of many genera of crop pests. However, non-economic forms are poorly studied.

The subfamily Rutelinae includes more than 1000 species (Blackwelder, 1944) and the majority of them are in the Neotropical Region. There is little information about larvae from this region and many genera are completely unknown or undescribed.

Ritcher (1948, 1968) characterized the larvae of the subfamily Rutelinae from North America and presented keys to tribes and genera. He stated that "comparatively few larvae of the tribe Rutelini have been studied".

The Neotropical genus *Macraspis* (Rutelini) includes approximately 42 species (Blackwelder, 1944). Only the larva of *Macraspis dichroa cribata* Waterhouse, 1881 has been described (Monné, 1969). Ritcher (1948, 1966) illustrated two characters of *Macraspis lucida*: the scissorial area of the mandibles and the raster, giving no description.

This paper includes descriptions of the third instar larva and of the pupa of *Macraspis cincta* (Drury, 1782), and a comparison with the larva of *M. dichroa cribata* and *M. lucida* Olivier, 1789.

DESCRIPTION OF LARVA (Figs. 1-16)

Larva C-shaped (fig. 16). Maximum width of head capsule of the third instar larva (fig. 1) 5.6 to 6.2 mm; fairly smooth, only anterior region of frons and postclypeus punctured; reddish-brown, with clypeus, labrum and antennal socket darkened; mandibles nearly black. Epicranial stem 1:4.4 as long as head; frontal arms V-shaped, anteriorly convex outwards, posteriorly almost straight.

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Dorso-epicranial setae 4 on each side. Frons with 3 anterior frontal setae on each side, 1 exterior frontal setae, 3 posterior frontal setae on each side and 1 seta in each exterior angle of frons. Ocelli present. Clypeus trapezoidal, bearing 6 long setae on preclypeus; short setae absent. Labrum subtrapezoidal, nearly 1.5x longer than clypeus, with 4 tubercles near the anterior margin; with 6 posterior setae, 1 lateral seta, 1 seta on each tubercle and a row of short setae on the anterior margin. Epipharynx (fig. 12) without plegmata and epizygum; zygum forming a transverse, curved, sclerotized tubercle; haptomerum with heli disposed in 2 curved, transverse rows; sensillum with a row of 8 short sensilla; chetopariae with medially directed setae, the setae increasing in size towards the pedium; laetorma with pternotormal process well sclerotized and less sclerotized apotormal process; dextortorma curved; nesium present; acanthoparia with 9 short, curved, spine-like setae. Mandibles (figs. 6 and 7, dorsal view; figs. 8 and 9, ventral view). Left mandible: scissorial area with 3 teeth well separated by 2 notches; outer margin with 2 sulci and a longitudinal carina, bearing 5 long, slender setae. Right mandible: scissorial area with 2 teeth; molar area with 4 lobes, transversely ridged, and a long truncate acia; with brustia; outer carina with 5 long setae. Dorso-molar area of mandibles with a short row of short, slender setae. Ventro-molar area of mandibles with a small brush of short setae near the stridulatory area; stridulatory area of each mandible well marked by fine, transversely arranged striae. Maxilla (fig. 5 dorsal view; fig. 10, ventral view) with galea and lacinia completely fused-but limited on the dorsum by a distinct suture forming mala; mala with 2 unci, one apical and one pre-apical, and with a longitudinal row of 8 stout teeth near the inner margin (ventral view); maxillary stridulatory area (dorsal view) with a row of 9 short and sharp teeth and a wide truncate anterior process; palp 4-segmented. Labium (fig. 11). Antenna 4-segmented, as long as mandible; third segment extended into an obtuse process at distal end; last segment with 5-6 dorsal sensory spots (fig. 3). Thorax: prothorax with a single dorsal lobe; meso- and metathorax with 3 dorsal lobes each (prescutum, scutum and scutellum); prescutum and scutum of meso- and metathorax with a double transverse row of elongated setae; scutellum of meso- and metathorax with a single transverse row of long setae. Legs (figs. 13, 15) 4 segmented. Pro- and mesothoracic legs with sharp pointed falcate claws; claws of metathoracic legs much smaller; each claw with 2 prominent setae. Abdomen: abdominal segments 1-6 each with 3 dorsal lobes covered with numerous short, spine-like setae and a few scattered, long, slender setae; segment 7 with 2 dorsal lobes; short setae only on anterior lobe; posterior lobe with scattered short and long, slender setae; segments 8, 9 and 10 without lobes, enlarged, smooth; segment 8 and 9 with 2 transverse rows of short and long slender setae; segment 10 with short and long setae scattered. Raster (fig. 4) with 2 palidia; palidium consisting of an irregular and sinuous row of short, spine-like, mesally directed setae; septula long and narrow; tegillum placed laterad of palidia, with several posteriorly directed short setae and with numerous long setae laterally directed. Anal slit transversely curved; lower anal lobes covered with many slender setae and few short stout setae. Spiracles (fig. 2): respiratory plate reniform, lobes not contiguous, with irregular rows of "holes"; bulla circular, respiratory slit curved, longitudinal; mesothoracic (1) and abdominal (8) spiracles of the same size; mesothoracic spiracle with posterior emargination in respiratory plate; each abdominal spiracle with anterior emargination.

DESCRIPTION OF PUPA
(Figs. 17-19)

Length 23 mm. Color cream-white; gin-traps reddish-brown. Completely glabrous, smooth. Scutellum very large, triangular, reaching the second

abdominal segment. Elytra closely appressed to body, extending posteriorly to the third abdominal segment. Abdomen with 5 pairs of spiracles, the first 4 larger, with well sclerotized, ring-shaped, respiratory plates; first abdominal pair concealed by the elytra. Abdomen with 4 pairs of similar, equally developed gin-traps in the mid-dorsal edge of segments 2/3, 3/4, 4/5 and 5/6. Last abdominal segment with an apical notch. Mesosternal process very long, conical, with rounded apex reaching labium.

Material examined. BRAZIL. *São Paulo*: Caraguatatuba, 23.XI.1976, Cylo Torres col., 2 sets of larval and pupal skins associated with reared adults; Cotia, km 26 1/2 Rodovia Raposo Tavares, 15.X.1976, C. Costa & M. Simões col., 8 last instar larvae (2 fixed, 5 reared to adult, 1 pupa fixed); São Paulo, Cidade Universitária, 12.VII.1978, L. Fontes col., 5 last instar larvae reared to adult; idem, Itanhaém, 1.VIII.1978, L. Fontes col., 1 last instar larvae reared to adult. *Santa Catarina*: Tijucas, 18.VII.1978, L. Fontes col., 1 last instar larvae reared to adult.

Synopsis of bionomic data

Locality	Larvae caged date	Motionless		Pupa		Adult date
		date	days	date	days	
São Paulo	23.10.1976	-	-	9.01.1977	16	24.01.1977
Caraguatatuba	23.10.1976	29.07.1977	04	1.08.1977	14	14.08.1977
São Paulo	12.07.1978	-	-	30.08.1978	24	22.09.1978
Cid. Universitária	12.07.1978	25.08.1978	09	2.09.1978	22	24.09.1978
	12.07.1978	-	-	25.09.1978	16	09.10.1978
	12.07.1978	-	-	25.09.1978	16	09.10.1978
	12.07.1978	-	-	23.09.1978	10	03.10.1978
São Paulo Itanhaém	01.08.1978	-	-	12.09.1978	18	30.09.1978
Santa Catarina Tijucas	18.07.1978	-	-	23.08.1978	26	17.09.1978

DISCUSSION

Ritcher (1948, 1966) gives as characteristic of Rutelinae: the stridulatory structure of the mandible; the stridulatory teeth of the maxilla; lacinia with 1, 2 or 3 unci; epipharynx without proplegmata; dorsa of abdominal segments 9 and 10 never fused together. And for *Macraspis*: left mandible with 3 scissorial teeth; epipharynx without plegmata; venter of last abdominal segment with septula vague between palidia, anterior to the lower anal lip.

The larva of *Macraspis cincta* is very similar to that of *M. dichroa cribata* and *M. lucida*, and all three have the characters listed above as typical for the genus.

M. cincta and *M. dichroa cribata* also share the following characters: labrum with 4 tubercles near the anterior margin; mandibles and maxillae with stridulatory areas very similar. Some differences are present (data on *dichroa* according to Monné, 1969): in *dichroa* the ocelli are absent (present in *cincta*); maxilla with a single uncus (2 unci in *cincta*); last antennal segment with 3 sensorial spots (5-6 in *cincta*); each antennal segment with an apical process (only the

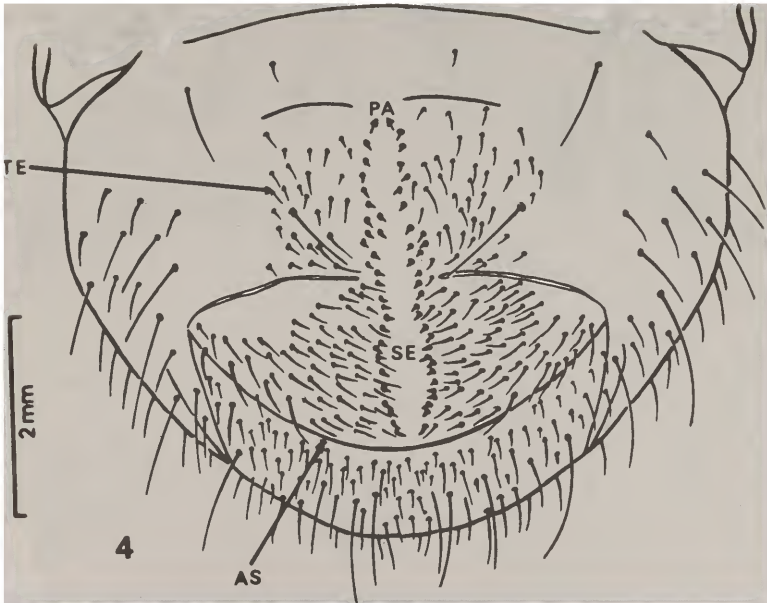
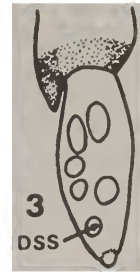
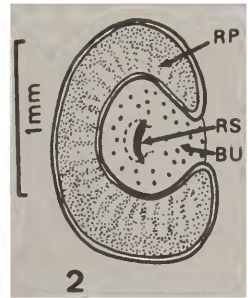
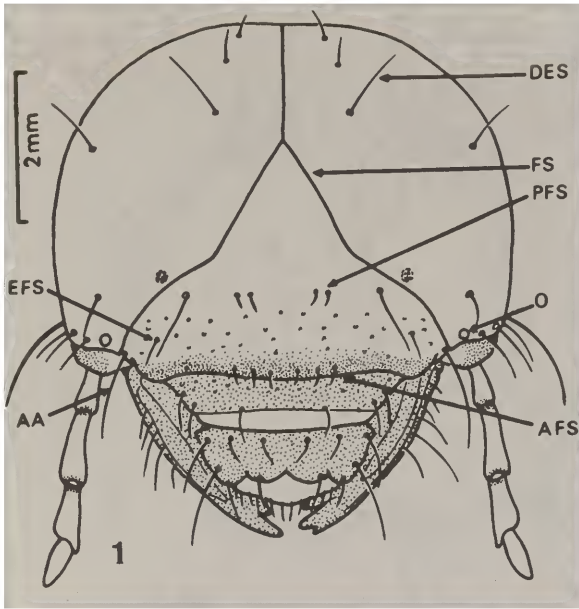
last segment is produced in *cincta*); claws unequal in length, anterior legs with claws shorter (the posterior legs with claws shorter in *cincta*). There are also minor differences regarding the number of the anterior frontal setae in the head capsule (6 in *dichroa*, 4 in *cincta*) and in the number of setae in the clypeus (4 in *dichroa*, 6 in *cincta*).

BIOLOGICAL DATA

Larvae of *Macraspis cincta* were collected from decayed logs. Laboratory rearing permitted observing the pupation. An oval pupal cell is formed by the larva with fragments of wood prior to pupation. The pupal phase took an average of 19 days.

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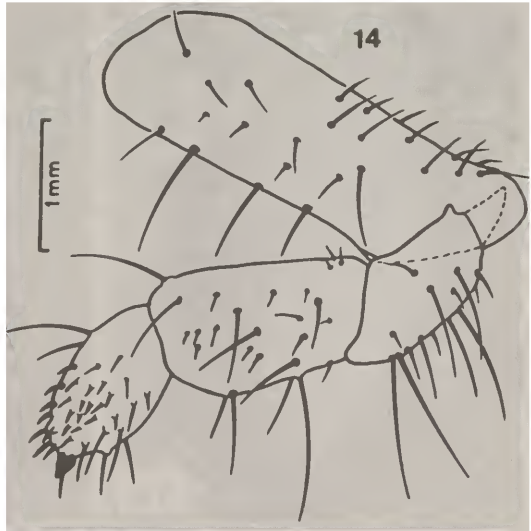
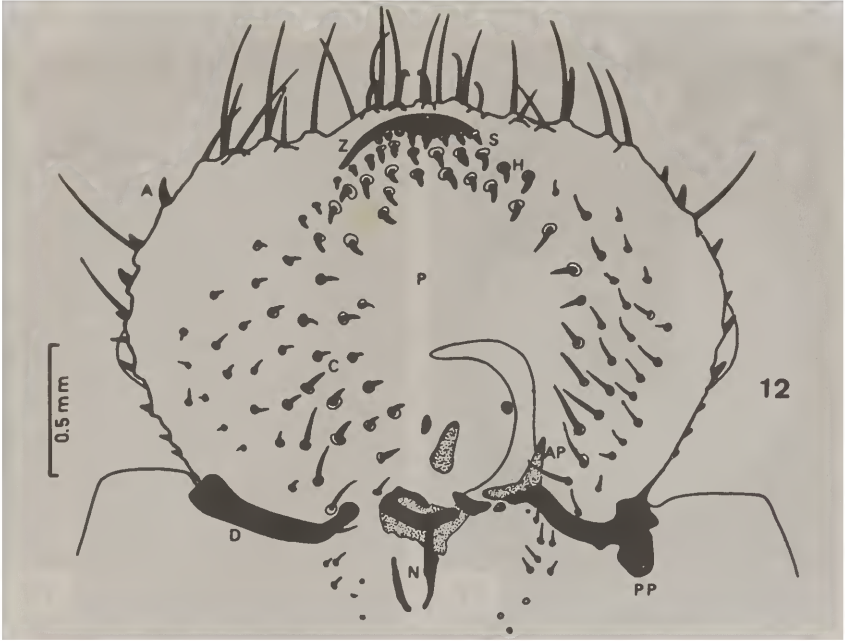
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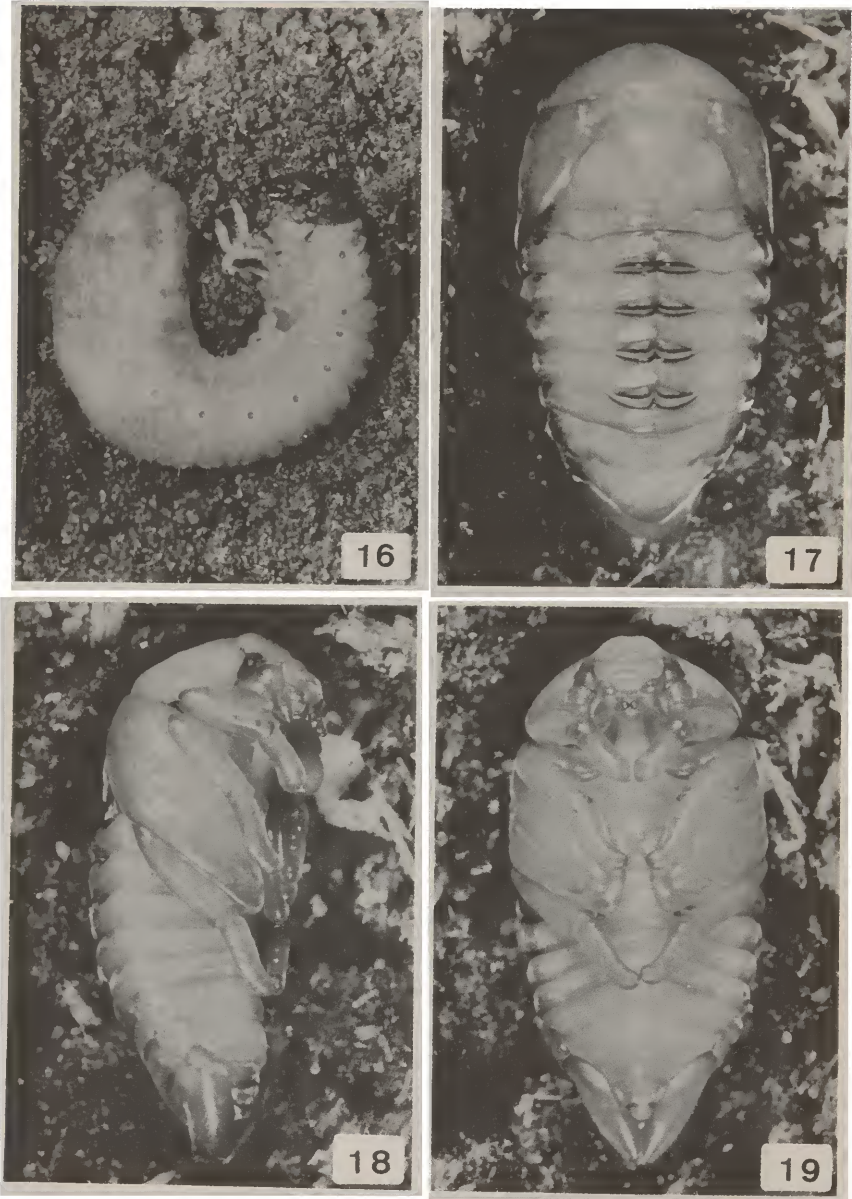
Macraspis cincta. Fig. 1, head and antenna; fig. 2, spiracle; fig. 3, dorsal sensory spots of antenna; fig. 4, raster.



Macraspis cincta. Fig. 5, maxilla, dorsal view; figs. 6-7, mandibles, dorsal view; figs. 8-9, mandibles, ventral view; fig. 10, maxilla, ventral view; fig. 11, labium.



Macraspis cincta. Fig. 12, epipharynx; figs. 13-15, legs.



Macraspis cincta. Fig. 16, larva; figs. 17-19, pupa.