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Descriptions of the Larvae of *Chlorota cincticollis* Blanchard and *Chasmodia collaris* (Blanchard) (Scarabaeidae: Rutelinae: Rutelini) with a Key to the Larvae of the American Genera of Rutelini

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DESCRIPTIONS OF THE LARVAE OF *CHLOROTA CINCTICOLLIS*
BLANCHARD AND *CHASMEDIA COLLARIS* (BLANCHARD)
(SCARABAEIDAE: RUTELINAE: RUTELINI) WITH A KEY TO
THE LARVAE OF THE AMERICAN GENERA OF RUTELINI

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Abstract

Larvae of the genera *Chlorota* Burmeister and *Chasmodia* Macleay (Scarabaeidae: Rutelinae: Rutelini) are described for the first time based on the larvae of *Chlorota cincticollis* Blanchard and *Chasmodia collaris* (Blanchard). The pupa of *C. cincticollis* is also described. A key to the larvae of 19 American genera of Rutelini and a list of the described species are provided.

Resúmen

Se describen por primera vez las larvas de los géneros *Chlorota* Burmeister y *Chasmodia* Macleay (Scarabaeidae: Rutelinae: Rutelini) con base en las larvas de *Chlorota cincticollis* Blanchard y *Chasmodia collaris* (Blanchard). También se describe la pupa de *C. cincticollis*, se presenta una clave para identificar las larvas de 19 géneros americanos de Rutelini y una lista de las especies cuyas larvas han sido descritas.

In the New World, there are approximately 75 genera and 650 species of scarab beetles in the tribe Rutelini (Scarabaeidae: Rutelinae [*sensu* Ohaus 1934] or Melolonthidae: Rutelinae [*sensu* Machatschke 1972]), a group that includes leaf-feeding beetles such as *Plusiotis* Burmeister, *Pelidnota* Macleay, and *Cotalpa* Burmeister. Larvae of 17 genera in the tribe Rutelini have been described previously, and we supplement the knowledge of Rutelini larvae by describing two species from previously undescribed genera, *Chlorota* Burmeister and *Chasmodia* Macleay (Table 1). Pupae of American Rutelini are less well known than are the larvae. Six genera and seven species have been described (Table 1), and we describe the pupa of *C. cincticollis* Blanchard in this work. We further the knowledge of American Rutelini larvae by providing a key to the 19 known genera.

Larvae of the American genera of Rutelini are characterized as follows (after Jameson *et al.* 1994; Jameson 1996, 1999; Monné 1969; Morón 1976a, b, 1983; Morón and Deloya 1991; Morón and Noguiera in press; Ritcher 1966; Vanin and Costa 1980): stipes of the maxilla with a dorsal row of 5–14 sharp, conical, or recurved stridulatory teeth and with an anterior process; lacinia with 1–2 unci (reduced or vestigial); epipharynx with haptomerum mound-like

Table 1. Described Larvae and Pupae of New World Rutelini (Scarabaeidae: Rutelinae)

Species	Stages(s)	Publication
<i>Calomacropsis concinna</i> (Blanchard)	larva	Jameson <i>et al.</i> 1994
<i>Chasmodia collaris</i> (Blanchard)	larva	(this publication)
<i>Chlorota cincticollis</i> Blanchard	larva and pupa	(this publication)
<i>Chrysina macropus</i> Francillon	larva	Morón 1976a
<i>Cnemida intermedia</i> Bates	larva	Jameson 1996
<i>Cotalpa lanigera</i> (Linn.)	larva	Ritcher 1966
<i>Heterosternus buprestoides</i> Dupont	larva (pupa figured)	Morón 1983
<i>Macraspis dichroa cribrata</i> Waterhouse	larva	Monné 1969
<i>Macraspis cincta</i> (Drury)	larva and pupa	Vanin & Costa 1980
	larva	Costa <i>et al.</i> 1988
<i>Macraspis lucida</i> (Olivier)*	larva	Morón 1976b
<i>Microrutela viridiaurata</i> (Bates)	larva	Jameson 1999
<i>Macropoides nietoi</i> Guérin	larva	Morón 1983
<i>Macropoides crassipes</i> (Horn)	larva	Morón 1983
<i>Paracotalpa ursina</i> (Horn)	larva	Ritcher 1966
<i>Paraheterosternus luedeckei</i> (Becker)	larva and pupa	Morón & Noguiera (in press)
<i>Parastasia brevipes</i> Westwood	larva	Ritcher 1966
<i>Parisolea pallida</i> (Candèze)	larva	Morón 1983
<i>Pelidnota virescens</i> Burmeister	larva	Morón 1976a
<i>Pelidnota punctata</i> (Linn.)	larva	Ritcher 1966
<i>Platyrutela cribrata</i> Bates	larva	Solís & Morón 1998
<i>Platyrutela arenicola</i> Solís & Morón	larva	Solís & Morón 1998
<i>Plustiotis adelaida</i> Hope	larva	Morón 1976a
<i>Plustiotis woodi</i> Horn	larva	Ritcher 1966
<i>Rutela formosa</i> Burmeister	larva	Ritcher 1966
<i>Rutela dorcyi</i> (Olivier)	larva and pupa	Jameson 1998
<i>Rutelisca durangoana</i> Ohaus	larva and pupa	Morón & Deloya 1991

* Published as *Macraspis rufonitida* Burmeister.

or beak-like and with a group of 15 or more spine-like setae; epipharynx with 1 or 2 nesia present; proplegmata absent; plegmata present or absent; dorsal surface of last antennal segment with 2 or more dorsal sensory spots; raster with or without palidia; palidia polystrichous (if present).

**Key to the American Genera of Rutelini Based on Third-Instar Larvae
(Modified from Jameson 1999)**

- | | | |
|-----|---|-----------------------------|
| 1 | Left mandible with 2 teeth in scissorial region (including sharp tip) ... | 4 |
| 1' | Left mandible with 3 well-defined teeth in scissorial region | 2 |
| 2 | Lacinia of maxilla with 1 uncus (well-developed or reduced) | 12 |
| 2' | Lacinia of maxilla with 2 or 3 unci | 3 |
| 3 | Lacinia of maxilla with 2 unci (subequal or 1 reduced and represented by a short, stout seta) | 9 |
| 3' | Lacinia of maxilla with 3 unci, subequal. | <i>Platyrutela</i> Bates |
| 4 | Epipharynx with plegmata well developed. Septula present | 5 |
| 4' | Epipharynx without plegmata. Septula absent | 6 |
| 5 | Septula short, ovate. Lacinia of maxilla with 2 unci, subequal. Maximum width of cranium 3.6 mm | <i>Calomacrapis</i> Bates |
| 5' | Septula elongate, extended across venter of last segment and lower anal lip. Lacinia of maxilla with 1 reduced uncus. Maximum width of cranium 4.9 mm | <i>Parastasia</i> Westwood |
| 6 | Abdominal spiracles 1–6 subequal to abdominal spiracles 7–8 | 7 |
| 6' | Abdominal spiracles 1–6 smaller or larger than abdominal spiracles 7–8 | 8 |
| 7 | Stridulatory area of mandibles with approximately 7 stridulatory ridges in basal two-thirds | <i>Rutela</i> Latreille |
| 7' | Stridulatory area of mandibles with approximately 20 stridulatory ridges in basal two-thirds | <i>Microrutela</i> Bates |
| 8 | Spiracles of abdominal segments VII and VIII noticeably larger than preceding spiracles. Maximum width of cranium 5.8 mm. | <i>Paracotalpa</i> Ohaus |
| 8' | Spiracles of abdominal segments VI, VII, and VIII noticeably smaller than preceding spiracles. Maximum width of cranium 6.9 mm | <i>Cotalpa</i> Burmeister |
| 9 | Septula irregularly defined on lower anal lip. Lacinia with apical uncus well developed; basal uncus reduced, truncate, and with a short, stout seta | <i>Rutelisca</i> Bates |
| 9' | Septula absent. Lacinia with unci subequal; basal uncus not reduced, not truncate, and without a short, stout seta | 10 |
| 10 | Epipharynx with epizygom. Spiracles of abdominal segments VII and VIII similar in size to preceding spiracles. Maximum width of cranium variable | 11 |
| 10' | Epipharynx without epizygom. Spiracles of abdominal segments VII and VIII noticeably larger than preceding spiracles. Maximum width of cranium 7.0 mm | <i>Pelidnota</i> Macleay |
| 11 | Last antennal segment with 7–13 dorsal sensory spots. Maximum width of cranium 10.0 mm | <i>Chrysina</i> Kirby |
| 11' | Last antennal segment with 2–5 dorsal sensory spots. Maximum width of cranium 6.0–7.2 mm. | <i>Plusiotis</i> Burmeister |
| 12 | Clythra of epipharynx present, symmetrical. | <i>Cnemida</i> Kirby |
| 12' | Clythra of epipharynx absent | 13 |

- 13 Last antennal segment with 4–6 dorsal sensory spots 17
 13' Last antennal segment with 2 dorsal sensory spots 14
 14 Lobes of respiratory plate separated 15
 14' Lobes of respiratory plate contiguous 16
 15 Maxillary stridulatory area with row of 6 teeth. Pro- and mesotarsal claws with 2–5 long, stout setae *Macropoides* Guérin
 15' Maxillary stridulatory area with row of 8–9 teeth. Pro- and mesotarsal claws with a rounded, apical process and 1 externobasal seta and 1 anterior preapical seta. *Paraheterosternus* Morón
 16 Metathoracic tarsal claws reduced relative to pro- and mesothoracic claws. Spiracles of abdominal segments I–VIII progressively smaller. Head capsule dark reddish-brown. Maximum width of cranium 9.0 mm *Heterosternus* Dupont
 16' Metathoracic tarsal/claws not reduced relative to pro- and mesothoracic claws. Spiracles of abdominal segments I–V progressively smaller and segments VI–VIII progressively larger. Head capsule bicolored, dark brown to reddish-yellow. Maximum width of cranium 5.0 mm *Parisolea* Bates
 17 Metathoracic tarsal claws reduced and weakly sclerotized relative to pro- and mesothoracic claws *Macrapsis* Macleay
 17' Metathoracic tarsal claws subequal and similarly sclerotized relative to pro- and mesothoracic claws 18
 18 Head with 1 lateral ocellus *Chasmodia* Macleay
 18' Head lacking lateral ocellus *Chlorota* Burmeister

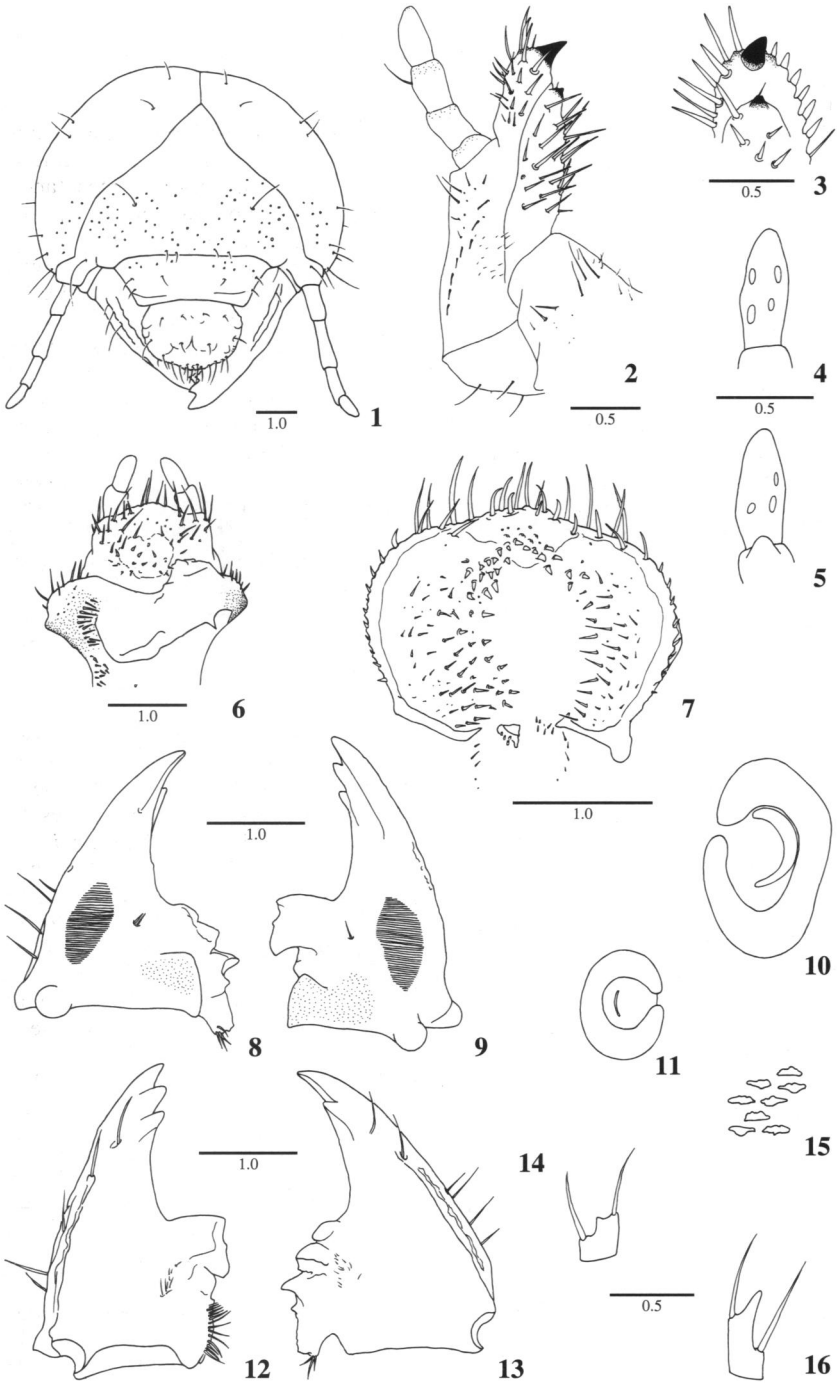
Larva and Pupa of *Chlorota* Burmeister

We describe the first known larva and pupa for the genus *Chlorota* based on *Chlorota cincticollis*. Based on *Chlorota cincticollis*, larvae in the genus *Chlorota* are most similar to those of *Macrapsis* and *Chasmodia*. Larvae of *Chlorota* and *Macrapsis* are separated based on the metathoracic claws (in *Chlorota* all claws are subequal and similarly sclerotized; in *Macrapsis* the metathoracic claw is greatly reduced and poorly sclerotized in comparison to the pro- and mesothoracic legs), and epipharynx (without a septula in *Chlorota*; with a septula in *Macrapsis*). Larvae of *Chlorota* and *Chasmodia* are separated based on the ocellus (lacking in *Chlorota*; present in *Chasmodia*), setae of the disc of the labium (with short, stout setae in *Chlorota*; with slender, moderately long setae in *Chasmodia*), and the lateral lobe of the labium (with a line of setae on the discal region in *Chlorota*; with a random field of setae in *Chasmodia*).

The genus *Chlorota* includes approximately 22 species (Machatschke 1972) distributed from southern Mexico to the Amazon Region and southeastern Brazil. Only one member of the genus, *C. cincticollis*, occurs in Mexico. *Chlo-*

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Figs. 1–16. *Chlorota cincticollis*, third-instar larva. 1) Head, frontal view; 2) left maxilla, frontal view; 3) apex of left maxilla; 4) last antennal segment, dorsal view; 5) same, ventral view; 6) labium and hypopharynx, frontal view; 7) epipharynx; 8) right mandible, posterior view; 9) left mandible, posterior view; 10) prothoracic spiracle; 11) 4th abdominal spiracle; 12) left mandible, anterior view; 13) right mandible, anterior view; 14) mesotarsungulus; 15) metatarsungulus; 16) detail, holes of respiratory plate.



rota cincticollis is distributed from southern Mexico to Venezuela where it inhabits tropical perennial forests and secondary forests at elevations between 100–700 m (Morón *et al.* 1997). In Mexico, adults of *C. cincticollis* have been observed feeding in the inflorescences of *Astrocaryum mexicanum* Liebm. (Palmaceae) and have been collected at rotting plantain and bananas (Morón *et al.* 1997).

Third-Instar Larva of *Chlorota cincticollis* Blanchard
Figs. 1–16

Specimens Studied. Four third-instar larvae, one cast skin of third-instar larva, one prepupa, one pupa, and one adult with the following data: MEXICO: Oaxaca, 1.5 km de Puerto Eligio, Carr. Tuxtepec-Cerro Pelón, 1-III-1988, 680 m, coffee plantation, P. Reyes-Castillo and C. Castillo, moist rotten stump with many larvae and pupae. One prepupa, one pupa, one cast skin, and three larvae are housed at the Instituto de Ecología (Xalapa, Mexico) and one at the University of Nebraska State Museum.

Description. Head. *Cranium* (Fig. 1): Widest width of head capsule 6.5–6.6 mm, width from external edges of scape 5.6–5.7 mm. Epicranium reddish-yellow; mandibles, base of labrum, and base of clypeus piceous; apex of frons reddish-brown. Surface finely alutaceous (base to middle) and punctate (middle to apex); punctures moderately large and moderate in size, moderate in density. Frontal suture and clypeofrontal suture distinct. Epicranium with 2 dorsoepicranial setae on each side; frons with 1 long posterior frontal seta on each side and 2 small anterior frontal setae on each side at middle; anterior frontal angle with 1 moderately long seta on each side. Ocellus absent. *Clypeus*: Form trapezoidal. Surface of postclypeus moderately densely punctate; punctures moderate in size, moderate in density; surface of preclypeus finely alutaceous. Lateral margin of postclypeus with 1 long and 1 moderately long, robust seta on each side. *Labrum*: Form subovate, symmetrical. Surface weakly tuberculate; 1 weak tubercle basolaterally on each side, 4 weak tubercles at margin of subapex. Base and disc sparsely, setigerously punctate; punctures shallow; setae robust, moderately long and long. Subapical margin with 4 evenly spaced, large, shallow, setigerous punctures; setae moderately long, brown. Apex densely punctate; punctures moderately large, setigerous; setae thick, short. *Epipharynx* (Fig. 7): Form suboval, symmetrical. Haptomerum weakly raised with about 10 irregular, short heli. Zygum and epizygum absent. Acanthoparia with 10–11 stout, short, recurved spines. Plegmatia lacking. Gymnoparia narrowed. Each chaetoparia with about 50 setae; lateral setae moderately long and short, setae progressively more short, stout, and spine-like toward middle. Pedium well defined. Haptolachus with well-developed sensory cone and 3–4 nesia; crepis lacking. Dexiotorma elongate. Laeotorma with broad, rounded, posteriorly produced pternotorma. *Right Mandible* (Figs. 8, 13): Scissorial region with 2 scissorial teeth (second tooth reduced). Lateral face with 4–5 long setae. Dorsal surface with row of about 15 feeble, dorsomolar setae. Ventral surface with elongate-oval stridulatory area comprised of approximately 37 parallel, equally spaced ridges; ridges progressively shorter at apex and base; molar area broad, poorly defined, calx produced, brustia with 4 moderately long setae; ventral process broad, well developed, with asperities. *Left mandible* (Figs. 9, 12): Scissorial region with 3 scissorial teeth (third tooth reduced). Lateral face with 5 long setae. Dorsal surface with about 10 dorsomolar setae. Ventral surface with elongate-oval stridulatory area comprised of about 40 parallel, equally spaced ridges; ridges progressively shorter at apex and base; molar area with 1 broad, inverted V-shaped lobe and 1 broad, weakly concave lobe; brustia composed of a U-shaped row of about 30 setae. *Maxilla* (Fig. 2): Cardo subtriangular. Stipes larger than wide. Lacinia with many stout setae, heli, and 1 vestigial uncus at subapex with apical seta. Galea with numerous stout setae, heli and 1 well-developed uncus (Fig. 3). Palpus 4-segmented, segment 1 half length of segment 2, segments 2–3 subequal. Stridulatory area with 7 narrowed, curved spines and anterior truncate process. *Labium* (Fig. 6): Surface with moderately long and short setae. Internal surface of glossa

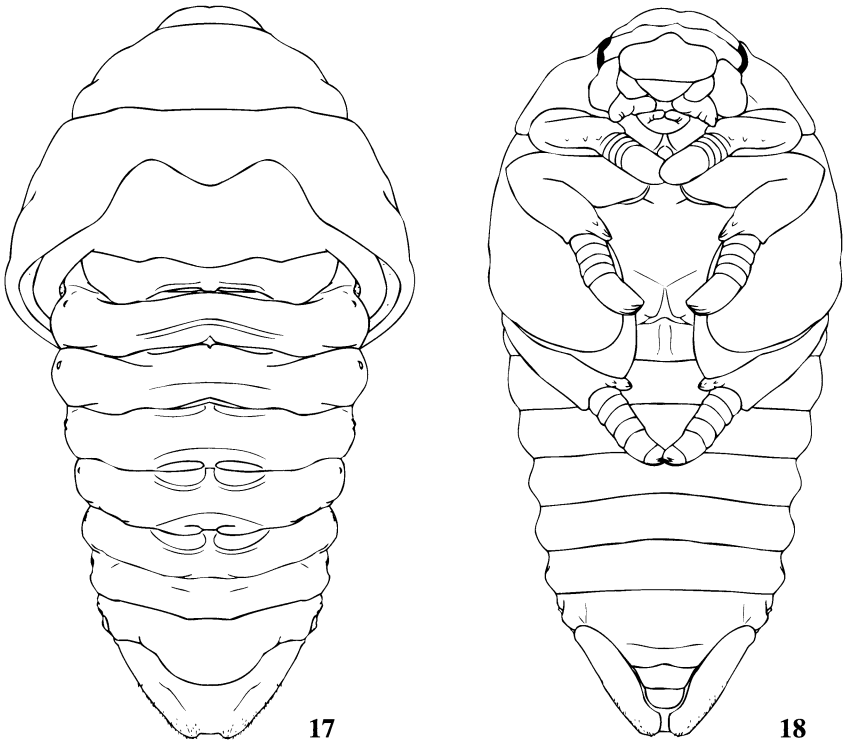
with moderately dense, moderately long and short setae; disc with robust, short, spine-like setae, setae moderately dense. Hypopharyngeal sclerome asymmetrical, concave, right side with raised truncate process, lateral lobe with line of stout setae at margin and on discal region. *Antennae* (Figs. 4–5): 4-segmented, with well-defined scape; scape two-thirds length of antennal segment 1, segments 1 and 3 subequal in length, segment 2 about 0.25 times longer than segment 1, segment 4 about 0.25 times shorter than segment 3. Apical segment oval with 4 dorsal sensory spots (Fig. 4) and 3 ventral sensory spots (Fig. 5). Thorax. Surface sparsely setose. Prescutum of meso- and metathorax with 18–20 short and moderately long setae on disc. Scutellum of pro-, meso-, and metathorax with 10–12 short to moderately long setae. Prothoracic spiracle (1.14 mm high, .71 mm wide) about 2 times larger than abdominal spiracles; respiratory plates C-shaped and surrounding flattened bulla (Fig. 10); respiratory holes (Fig. 15) elongate-oval with irregular margin, 27–34 holes fit across diameter of plate; distance between lobes of plate less than dorsoventral diameter of bulla. *Legs*: Prothoracic leg slightly shorter than meso- or metathoracic legs. Trochanter, femur, and tibiotarsus with numerous, stout, moderately long setae. Pro- and mesothoracic tarsunguli (Fig. 16) yellowish-brown, falcate, with 2 proximal setae; 1 seta near base, 1 seta near apex. Metathoracic tarsugulus (Fig. 14) short, weakly falcate, with 2 proximal setae; 1 seta near base, 1 seta at apex, sparsely setose. **Abdomen.** Spiracles of segments 1–8 similar in size (0.61–0.66 mm high, 0.47–0.57 mm wide) (Fig. 11). Segments 1–7 with moderately dense, robust setae; abdominal segments 8–10 sparsely setose. Segments 1–7 divided into annulets; prescutum with 60–80 short, stout setae and 4 long setae near posterior margin; scutum with 80–100 short, stout setae and 4 long setae near posterior margin; scutellum with 100–120 short, stout setae and 10–14 long setae near posterior margin. Abdominal segment 7 divided into prescutum and scutum + scutellum; prescutum with about 100 short, stout setae and 6 long setae near posterior border; scutum + scutellum with sparse, minute setae and about 10 long setae near posterior border. Abdominal segment 8–9 not divided into annulets, each with sparse, minute setae and sparse long setae. Abdominal segment 10 with sparse to moderately dense setae; dorsal impressed line absent; raster with palidia moderately long, formed by about 20 slender, moderately long pali in each row; septula mainly defined on lower anal lip, with 16–22 moderately dense, moderately long setae at each side. Anal slit slightly curved.

Remarks. The following characters will separate *C. cincticollis* from other known Rutelini larvae: metatarsal claws (metatarsunguli) shorter than the preceding claws, septula and palidia mainly defined on the lower anal lip, frons finely punctate, and last antennal segment with four dorsal sensory spots. Larvae of *C. cincticollis* are xylophagous and have been found in rotting logs in association with adults and pupae at the end of the winter season (January to April).

Pupa of *Chlorota cincticollis* Blanchard
Figs. 17–18

Morón (1993) characterized the pupae in the tribe Rutelini as possessing 5–6 pairs of dioneiform organs (occasionally weakly sclerotized); primary stigma (I–IV) generally darkened, stigmata V–VIII conspicuous but closed, last stigma closed, prominent or collapsed; urogomphi absent; tergo-lateral tubercles absent; tergites VII–VIII separated. The ecydsial opening of Rutelini larvae is nearly always along the entire dorsum (from head to raster) and the exuvium remains below the pupa, protecting the dorsal and lateral regions of the pupa (Morón 1993). Pupation in the Rutelini generally occurs in a pupal cell in soil or inside rotting wood (Morón 1993).

Specimens Studied. One pupa of *C. cincticollis* was collected with larvae and a teneral adult. The specimen is housed at the Instituto de Ecología (Xalapa, Mexico) with the following data: MEXICO: Oaxaca, 1.5 km de Puerto Eligio, Carr. Tuxtepec, Cerro Pelón, 1-III-88, 680 m, coffee plantation, P.



Figs. 17–18. *Chlorota cincticollis*, pupa ($\times 6.3$). **17)** dorsal view; **18)** ventral view.

Reyes-Castillo and C. Castillo colls., moist rotten stump with many larvae and pupae.

Description (Figs. 17–18). Length 32.4 mm. Widest width 16.4 mm. Shape oval, stout, exarate. Cream-yellowish. Surface glabrous (except at apex of abdomen). *Head*: Bent ventrally; clypeus inflated, clypeofrontal suture clearly sinuated; labrum, mandibles, maxillae, and palps, discernible, antennal tecae expanded, rounded. *Thorax*: Pronotum convex, with irregular lateral borders. Mesonotum at base weakly arcuate posteriomediaally. Elytral and hind wing tecae closely appressed, curved ventrally around body; elytral tecae extending to 1st abdominal segment; hind wing tecae extending to 2nd abdominal segment; legs with distinct, shortened, stout tarsomeres, meso- and metatibial apical spurs evident. *Abdomen*: Segments 1–7 (ventral view) well defined; segment 8–9 coalesced, subequal to segments 5–7 combined. Segments 1–6 (dorsal view) with well defined dioneiform organs at mid-base and mid-apex between segments 1–2, 2–3, 3–4, 4–5, 5–6; segments 8–9 coalesced; apex (except at middle) with dense, short, brown setae. Spiracles 2–4 oval and with sclerotized, piceous spiracular ring; spiracles 5–8 round, rosette-form, without sclerotized, piceous spiracular ring. Urogomphi lacking, but with latero-distal lobes well defined, with rounded apex; genital ampulla small, rounded, slightly prominent.

Remarks. The pupa of *C. cincticollis* is similar to that of *Macraspis* species, but the posterior border of the mesonotum and the tarsi are more elongated in *Macraspis* species.

Larva of *Chasmodia* Macleay

Based on *C. collaris*, the larvae of *Chasmodia* are most similar to those of *Macraspis* and *Chlorota*. Larvae of *Chasmodia* and *Macraspis* are separated based on the metathoracic claws (in *Chasmodia* the metatarsal claws have a shortened apical process, in *Macraspis* the metatarsungulus is greatly reduced and poorly sclerotized in comparison to the tarsunguli of the pro- and mesothoracic legs), and the width of the septula (clearly defined on the lower anal lip of *Macraspis* larva, vaguely defined in the same area of *Chasmodia* larva). Larvae of *Chlorota* are separated from larvae of *Chasmodia* based on the ocellus (lacking in *Chlorota*); number of dorsal sensory spots of the last antennal segment (six in *Chasmodia*, four in *Chlorota*); number of maxillary stridulatory teeth (five in *Chasmodia*, seven in *Chlorota*); setae of the disc of the labium that are moderately long and slender (short and stout setae in *Chlorota*), and the disc of the lateral lobe of the labium which has a random field of setae in *Chasmodia* (with a line of setae on the discal region in *Chlorota*).

The genus *Chasmodia* is exclusively Neotropical and includes approximately 31 species (Machatschke 1972; Delgado 1997) distributed from southern Mexico to Paraguay, middle Argentina, and southern Brazil. Two species of *Chasmodia* occur in Mexico: *C. collaris* Blanchard and *C. jamesonae* Delgado. *Chasmodia collaris* is distributed from southern Mexico to Panama where it inhabits tropical perennial forests and subperennial forests at elevations between 100–1,400 m (Morón *et al.* 1997). Adults have been observed feeding on *Piper* spp. (Piperaceae) and have been found in the soil in May and September (Morón *et al.* 1997).

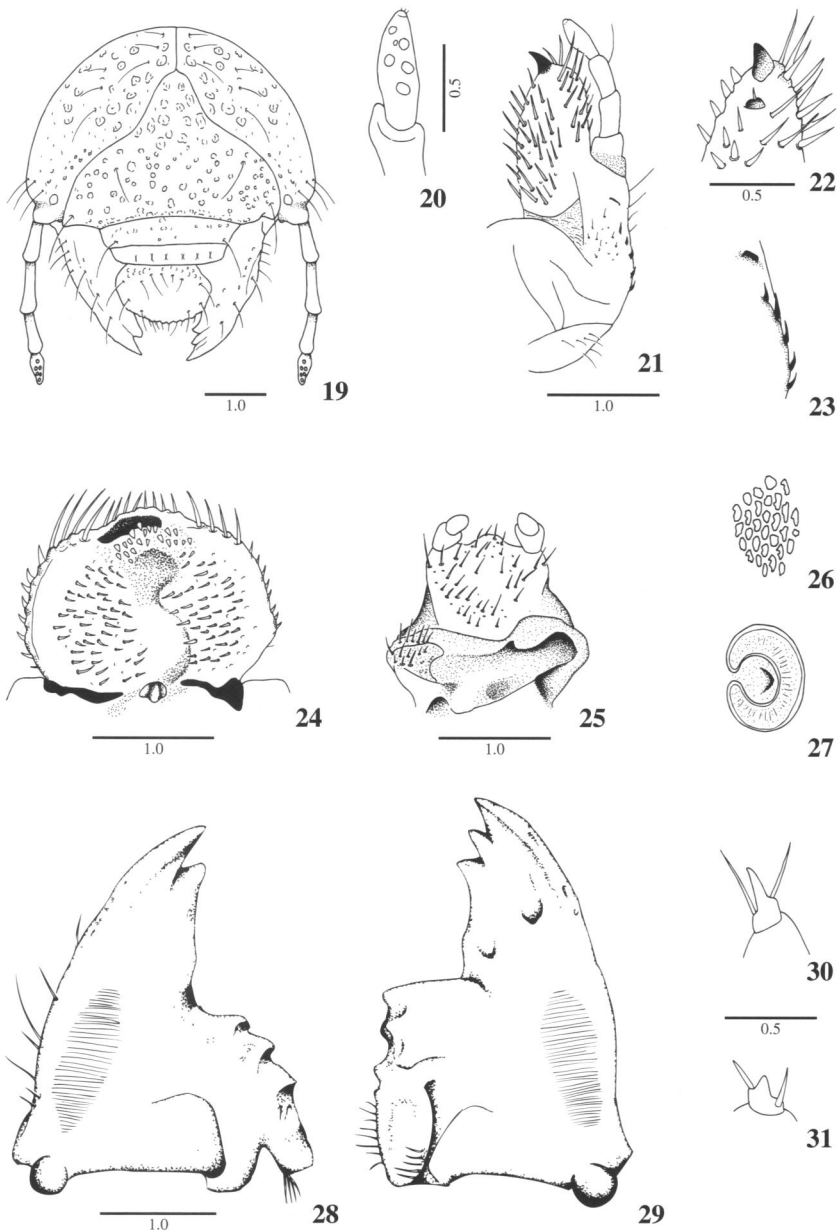
The description of *C. collaris* larva is based on one cast skin that is broken and partially distorted. Thus, some characters were not easily observable.

Third-Instar Larva of *Chasmodia collaris* Blanchard

Figs. 19–31

Specimens studied. One cast skin of a third-instar larva and associated adult with the following data: MEXICO: Chiapas, Montes Azules, Najá, 18-I-1979, unidentified rotten log, 700 m, J. Valenzuela. The cast skin was obtained by rearing the third-instar larva in rotting wood. The pupal stage lasted 35 days at 24°C, and the adult was collected immediately. Specimens housed at the Instituto de Ecología, Xalapa, México.

Description. Head. *Cranium* (Fig. 19): Maximum width of head capsule 4.7 mm. Surface of cranium unicolorous, yellowish-orange. Surface of cranium deeply punctate near clypeus, shallowly punctate-reticulate near epicranium, shallow and randomly punctate on base of clypeus, and rugopunctate on borders of labrum and anterior face of mandibles. *Frons* (Fig. 19) without anterior frontal setae and exterior frontal setae and with 1 long, posterior frontal seta on each side; each anterior angle of frons with 1 long seta; remaining cranial surface with 3 dorso-epicranial setae, 3 epicranial setae and 3 para-ocellar setae on each side. *Ocelli* small, poorly defined. *Anterior tentorial pits* not apparent. *Clypeus*: 1 long, lateral seta present on each side. *Labrum*: Form slightly asymmetrical, left lateral margin widely angulate; 5 setae near base; without central setae; 3 lateral setae at each side. *Epipharynx* (Fig. 24): Haptomerum entire, prominent, with 2 irregular rows of short, conical heli; each row with 10 heli. *Zygom* wide, not extended at sides. *Epizygom* absent. *Chaetoparia* with sparse sensilla; right chaetoparia with 54 spine-like setae; left chaetoparia with 51 spine-like setae; left acanthoparia with 9 short, spine-like setae; right acanthoparia with 8 short, spine-like setae; acroparia with 8 thick, long setae; pedium clear, wide; gymnoparia narrow, without plegmatia; dextiotorma sinuose; sclerotized plate poorly sclerotized; sensory cone surrounded by strongly scler-



Figs. 19–31. *Chasmodia collaris*, third-instar larva. **19)** Head, frontal view; **20)** last antennal segment, dorsal view; **21)** right maxilla, frontal view; **22)** apex of right maxilla; **23)** detail, stridulatory maxillary teeth; **24)** epipharynx; **25)** labium and hypopharynx, frontal view; **26)** detail, holes of respiratory plate; **27)** second abdominal spiracle; **28)** right mandible, posterior view; **29)** left mandible, posterior view; **30)** mesotarsungulus; **31)** metatarsungulus.

otized, wide plate; haptolachus with scattered sensilla; laeotorma sinuous, narrowed toward epitorma, with rounded apex; pternotorma wide, rounded, completely fused with laeotorma; dexiophoba and laeophoba absent. *Right Mandible* (Fig. 28): Scissorial area shortened, with 2 strong acute, apical teeth; molar area with 3 wide convex, ridged lobes; calx truncated; brustia formed by 4 setae; ventral process wide, rounded. *Left Mandible* (Fig. 29): Scissorial area shortened, with 3 shortened acute, apical teeth; molar area with prominent, sharp, distal lobe and ridged basal lobe; acia absent; brustia absent; ventral process slightly narrowed, rounded. Ventral stridulatory area of both mandibles elongated, narrowed toward their ends, formed by microscopic, transverse ridges; without setose punctures near stridulatory area. *Maxilla* (Figs. 21–22): Galea (Figs. 21–22) with 1 well-developed terminal uncus. Lacinia with 1 reduced uncus and a minute seta. Maxillary terminal unci surrounded by 4 long, dorsolateral, stout, sclerotized setae, 3 ventral heli, and 2 mesal heli. Maxillary stridulatory area with regular row of 5 long, sharply pointed teeth and with anterior process (Fig. 23). *Labium* (Fig. 25): Hypopharyngeal sclerome asymmetrical, strongly produced on right side into tooth-like, curved process. Anterior border of labial glossa medially prominent. *Antennae* (Fig. 20): Segments moderately enlarged; ventral process at distal border of 3rd segment weakly developed, with rounded apex. Dorsal surface of last antennal segment with 6 oval or rounded sensory spots (Fig. 3b). Ventral surface of last antennal segment with 7 oval sensory spots. **Thorax.** Thoracic spiracles 0.5 mm long and 0.6 mm wide; respiratory plate reddish brown, regularly shaped as a closed "C", with 16–22 irregularly shaped holes (Fig. 26) across diameter. Spiracular bulla slightly prominent, rounded. Distance between lobes of respiratory plate shorter than dorso-ventral diameter of the bulla. Pronotum with distinct, yellowish, broad, irregularly shaped, lateral scleromes, without setae at each side. Dorsum of prothorax with transverse row of 16 long, slender setae; mesoprescutum with transverse, irregular row of 12 long, slender setae; mesoscutellum with transverse row of 12 long, slender setae; metaprescutum with 6 long, slender setae; metascutellum with 16 long, slender setae. *Legs* (Figs. 30–31): Tarsal claws on pro- and mesothoracic legs with sharply pointed apical process, 1 external preapical seta and 1 internal basal seta (Fig. 30). Tarsal claws on metathoracic legs reduced, with subconical apical process, and with 2 long setae (Fig. 31). **Abdomen.** Spiracles on abdominal segment I 0.39 mm long and 0.52 mm wide; spiracles on segments II–III slightly wider than preceding, 0.42–0.43 mm long and 0.60–0.61 mm wide; spiracles on segments IV–VII slightly narrower than preceding, 0.41–0.50 mm long and 0.51–0.53 mm wide; spiracles on abdominal segment VIII smaller than preceding, 0.42 mm long and 0.43 mm wide. Respiratory plates reddish brown, regularly shaped as a closed "C"; spiracular bulla slightly prominent, rounded; distance between lobes of respiratory plate shorter than dorsoventral diameter of bulla. Dorsa of segments I–VI each with 1 irregular, transverse row of 20–24 long, slender setae and many short, spine-like setae; dorsum of segment VII with transverse row of 20 long, slender setae and sparse, spine-like setae, dorsa of segments VIII–IX with 2 irregular, transverse rows of 12–20 long, slender setae; dorsum of segment X with 2 vaguely defined, transverse rows of 6–10 long, slender setae and 28 scattered, long, slender setae. Raster with 25–28 short and moderately long, mixed setae on campus; tegilla formed by 20–24 long and short mixed setae on each side; barbula formed by 4–5 long setae on each side; lower anal lip with 40–50 long, slender setae at each side of border; with poorly defined septula and irregular palidia formed by 13–16 pali extended on lower anal lip. Anal lip weakly curved. Approximate dorsal body length not measurable.

Remarks. The larva of *C. collaris* is the first larva described in the genus *Chasmodia*. The third-instar larva was collected from rotting logs on 18 January, pupated on 21 February, and the adult emerged on 28 March, 1978.

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