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Description of the puparium of *Cyphomyia aurifrons* Wiedemann and *Cyphomyia picta* Schiner (Diptera, Stratiomyidae, Clitellariinae) from Ilha da Marambaia, Rio de Janeiro, Brazil

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ABSTRACT. The puparia of *Cyphomyia aurifrons* Wiedemann, 1830, and *Cyphomyia picta* Schiner, 1868 are described for the first time. The larvae were collected under the bark of fallen trees in a tropical rain forest at Ilha da Marambaia, State of Rio de Janeiro, Brazil, (23°04'15"S, 43°53'59"W, sea level, approximately 42 Km²). Some biological notes are also presented.

KEY WORDS. Soldier flies, taxonomy, tropical rain forest.

RESUMO. Os pupários de *Cyphomyia aurifrons* Wiedemann, 1830 e *Cyphomyia picta* Schiner, 1868 são descritos pela primeira vez. As larvas foram coletadas sob a casca de árvores caídas em uma floresta tropical situada na Ilha da Marambaia, Estado do Rio de Janeiro, Brasil, (23°04'15"S, 43°53'59"W, nível do mar, aproximadamente 42 Km²). Notas biológicas são fornecidas.

PALAVRAS CHAVE. Floresta tropical, moscas soldado, taxonomia.

The Clitellariinae genus *Cyphomyia* Wiedemann, 1819, is widespread in the Neotropics, from Mexico to Argentina with 72 species (WOODLEY 2001). Thirty one species are known from Brazil (WOODLEY 2001) and from these only four species occur in Rio de Janeiro (PUJOL-LUZ 2002).

WIEDEMANN (1819) recognized *Cyphomyia* based on the following characters: face convex, eyes contiguous (rarely separated) in the males, broadly separated in the females, flagellum cylindrical, without a style, thorax rather elongated, scutellum rather large, trapezoidal, with two prominent spines set at the outer angles, abdomen circular oblong-ovate in outline, rather flattened, sometimes with pale markings but more often uniformly unicolorous, metallic black or blue, frequently ornamented with patches of apressed silvery pile.

Clitellariinae larvae from the Neotropics are poorly described. IIDE (1963a, b, 1967, 1968) (*Cyphomyia leucocephala* Hoffmannsegg in WIEDEMANN (1830); *Chordonota inermis* Wiedemann, 1830; *Cyphomyia souzalopesi* IIDE, 1967; *Euryneura robusta* Kertész, 1908, respectively) and VIANA *et al.* (2003) (*Auloceromyia vespiformis* Lindner, 1969) furnished the last records for Neotropical larvae in this subfamily. Larvae of other three species of Clitellariinae were registered to the south of the United States (Mexico). JAMES (1957, 1962) described the larva of *Cyphomyia pilosissima* Gerstaecker, 1857 and *Dicyphoma schaefferi* Coquillett, 1904, respectively and MCFADDEN (1967)

described the larva of *Cyphomyia marginata* Loew, 1866.

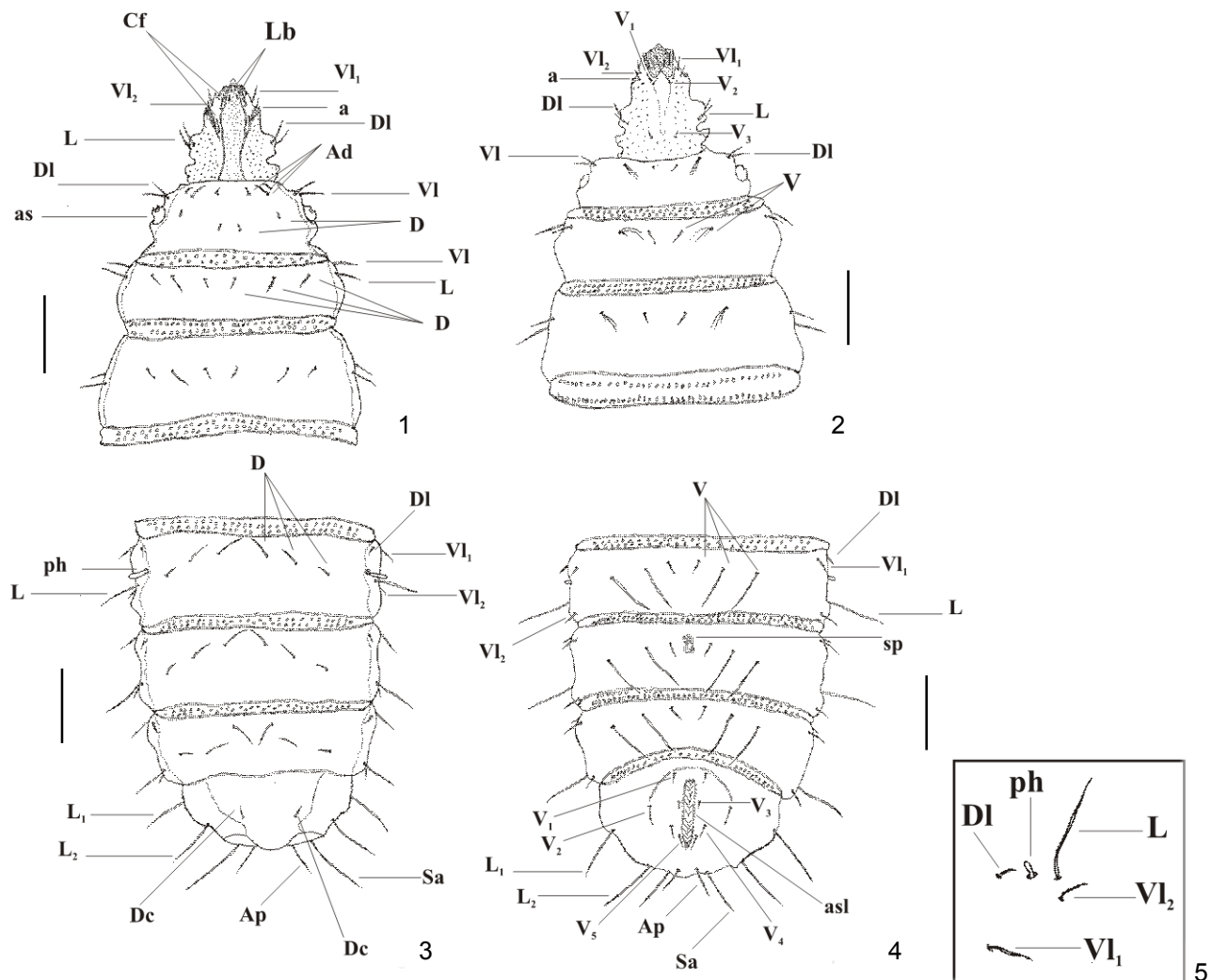
Herein the puparia of *Cyphomyia aurifrons* Wiedemann, 1830, based on twelve puparia and *Cyphomyia picta* Schiner, 1868, based on one puparium are described for the first time. The larval features studied in this work are the same used by VIANA *et al.* (2003).

Larvae of *Cyphomyia aurifrons* and *Cyphomyia picta* were collected under unidentified bark of fallen trees in a tropical rain forest at Ilha da Marambaia (23°04'15"S, 43°53'59"W, sea level), State of Rio de Janeiro, Brazil, outside and inside the forest behind a dam.

The larvae of *C. aurifrons* and *C. picta* were reared in laboratory as the methodology described in PUJOL-LUZ & XEREZ (1999) and VIANA *et al.* (2003). It seems that oviposition occurs in the moist substance, through crevices in the bark, because a large number of the smallest larvae of *C. aurifrons* and *C. picta* were found there.

Field and laboratory observations suggest that larvae of *C. aurifrons* and *C. picta* feed on microorganisms occurring in the moist areas beneath the bark of trees.

The adopted terminology follows JAMES (1981) and ROZKOŠNÝ & KOVAC (1994). The specimens upon which this study was based were deposited in the Coleção Entomológica Costa Lima (CECL), Universidade Federal Rural do Rio de Janeiro (UFRRJ), Instituto de Biologia, Seropédica, Brazil.



Figures 1-5. *Cyphomyia aurifrons*: (1) head and thoracic segments, dorsal view, (2) head and thoracic segments, ventral view, (3) 5th to 8th abdominals segments, dorsal view, (4) 5th to 8th abdominals segments, ventral view, (5) lateral view of 5th abdominal segment. (a) Antenna, (Ad) anterodorsal seta, (Ap) apical seta, (as) anterior spiracle, (asl) anal slit, (Cf) clypeofrontal seta, (D) dorsal seta, (Dc) dorsocentral seta, (DI) dorsal seta, (L) lateral seta, (Lb) labral seta, (ph) pupal respiratory horn, (Sa) subapical seta, (sp) sternal patch, (V) ventral seta, (VI) ventrolateral seta. Scale = 1 mm.

Cyphomyia aurifrons Wiedemann, 1830

Figs 1-5

Cyphomyia aurifrons Wiedemann, 1830: 56 (original description); James, 1973: 25 (catalogue); Woodley, 2001: 159 (catalogue).

Distribution. Neotropical: Argentina, Brasil: Rio de Janeiro (new record), Ecuador.

Material examined. BRAZIL, Rio de Janeiro: Ilha da Marambaia, 17.II.1998, R. de Xerez leg., 12 puparia (emerged:

30.III.1998, 02.IV.1998, 01.IV.1998, 10.IV.1998, 15.IV.1998, 18.IV.1998, 21.IV.1998, 24.IV.1998, 05.V.1998, 09.V.1998, 16.V.1998 and 20.V.1998 – 11 females and 1 male).

Puparium. Length 13.0 to 15.0 mm, dorsoventrally flattened, lateral margin of body segments strongly arched. Cuticle with the usual mosaic appearance, some cells forming characteristic patches and plaques on abdominal segments 6 and 8. Chromatic pattern yellowish brown, with some dark punctuations. As with other stratiomyids the puparium is developed from the last larval skin and retains many larval features.

Head. Short, moderately flat; mandibular-maxillary complex with well-developed, cylindrical brushes almost as long as the labrum, in dorsal view; labrum triangular. Antenna short bisegmented, rising at the anterior part of head. Eyes prominent, rounded, arising at the posterior part of the head. Two pairs of clypeofrontal setae (Cf), one pair of dorsolateral setae (DI) inserted above the eyes and one pair of lateral setae (L) inserted below eyes; two pairs of ventrolateral setae (VI) and three pairs of ventral setae (V) (Figs 1-2).

Thorax. First segment shorter than the others. Spiracle (as) prominent in lateral view ornated by one dorsolateral setae (DI) and one ventrolateral setae (VI) (Figs 1-2). First segment with one row of three anterodorsal setae (Ad), inner and outer smaller and two pairs of dorsal setae (D) (Fig. 1), in ventral view two pairs of ventral setae (V), outer trifurcated. Second and third segments with three pairs of dorsal setae (D), inner and outer smaller, in ventral view like first segment. Laterally both with one pair of lateral setae (L) and one pair of ventrolateral setae (VI) (Fig. 1).

Abdomen. Segments 1-7 with the same shape, in dorsal view (Fig. 3) with three pairs of dorsal setae, in decrease size from the inner to outer one, in ventral view (Fig. 4) three pairs of ventral setae, the inner shorter, the others at same size. In lateral view (Fig. 5) one pair of dorsolateral setae, one pair of lateral setae and two pairs of ventrolateral setae anterior longer than posterior. A conspicuous pupal respiratory horn (ph) in segments 2-5 (Fig. 5); ventromedial line of segment 6 with an elliptical sternal patch (sp) with a little constriction in the middle (Fig. 4). Segment 8 rounded with one pair of dorsocentral setae (Dc) (Fig. 3), in ventral view five pairs of ventral setae; in lateral view two pair of lateral setae (L), one pair of apical setae (Ap) and one pair of subapical setae (Sa) (Fig. 4).

Cyphomyia picta Schiner, 1868

Figs 6-10

Cyphomyia picta Schiner, 1868: 53 (original description); James, 1973: 27 (catalogue); Woodley, 2001: 162 (catalogue).

Distribution. Neotropical: Brazil, Rio de Janeiro (new record), Costa Rica, Ecuador, Panama.

Material examined. BRAZIL, *Rio de Janeiro*: Ilha da Marambaia, 17.II.1998, R. de Xerez *leg.*, 1 puparium (emerged 26.IV.1998 – 1 female).

Puparium. Length 16.0 mm, dorsoventrally flattened, lateral margins of body segments strongly arched. Cuticle with usual mosaic appearance, some cells forming characteristic patches and plaques on abdominal segments 6 and 8. Chromatic pattern yellowish brown. As with other stratiomyids the puparium is developed from the last larval skin and retains many larval features.

Head, Elongated and projected to the front, labrum triangular. Antenna (a) short bisegmented, rising at the anterior part of head with a fast lump of both the sides (Fig. 6). Eyes

prominent with a fast circumvallation in the medium region. Two pairs of clypeofrontal setae (Cf), one pair of dorsolateral setae (DI) inserted above the eyes and one pair of lateral setae (L) inserted below eyes; three pairs of ventrolateral (VI) and ventral setae (V) (Fig 6-7).

Thorax. First segment shorter than others. Spiracle (as) prominent, in lateral view rounded by one dorsolateral setae (DI) and one ventrolateral seta (VI) (Figs 6-7). First segment with one row of three pairs of anterodorsal setae (Ad) outer smaller and two pairs of dorsal setae (D) (Fig. 6), in ventral view two pairs of ventral setae (V), outer trifurcated (Fig. 7). Second and third segments with three pairs of dorsal setae (D), outer smaller, in ventral view similar to the first segment. Laterally both with one pair of lateral setae (L) and one pair of ventrolateral setae (VI) (Figs 6-7).

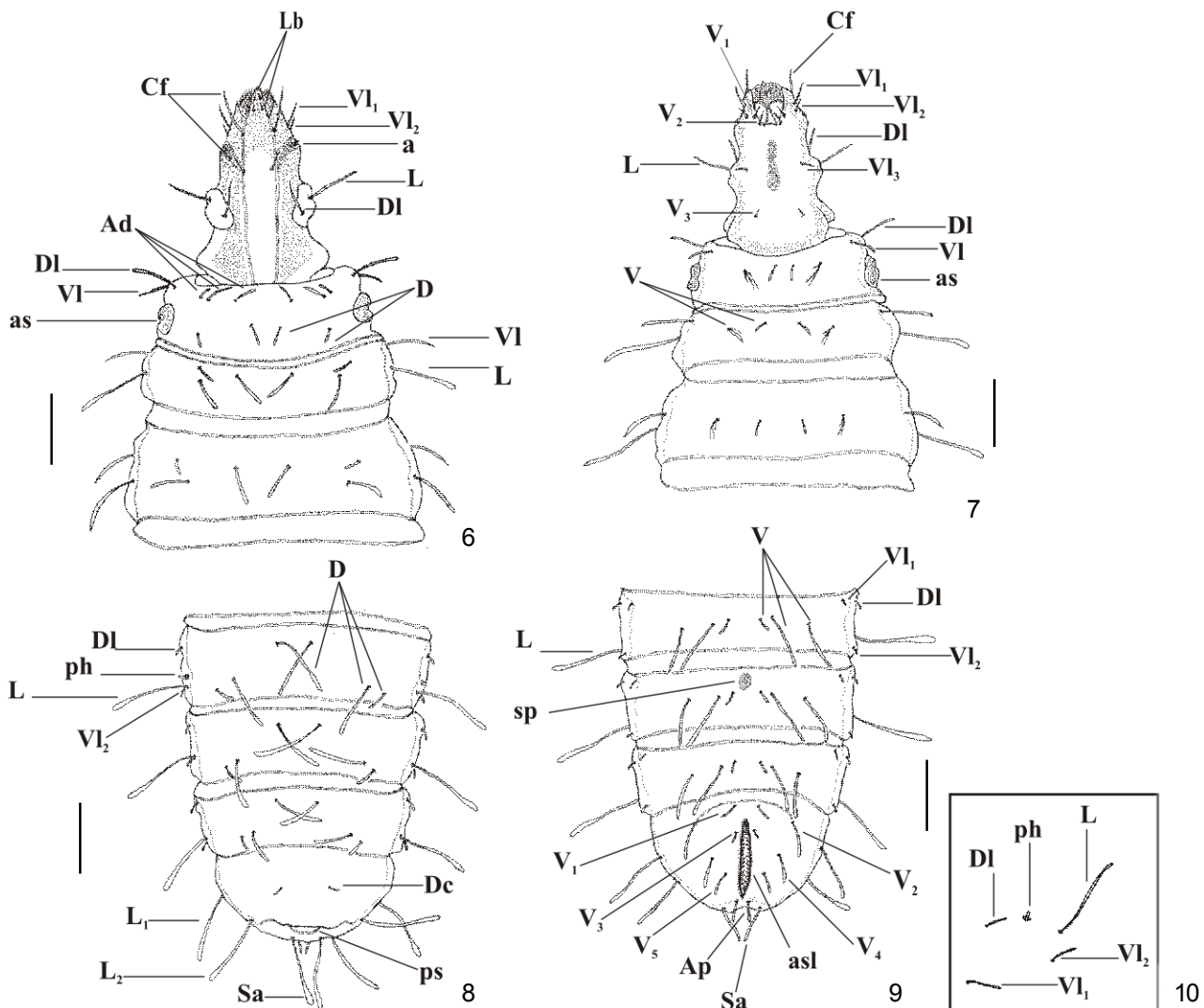
Abdomen. Segments 1-7 with the same shape, in dorsal view three pairs of dorsal setae (D), the inner bigger than others and its point of insertion is located more previously in relation to the others two pairs, the outer smaller (Fig. 8), in ventral view three pairs of ventral setae (V), the inner shorter than others (Fig. 9). In lateral view one pair of dorsolateral setae, one pair of lateral setae and two pairs of ventrolateral setae (Fig. 10). Pupal respiratory horn (ph) short, in segments 2-5. Ventromedial line of segment 6 with a circular sternal patch (sp) (Fig. 9). Segment 8 rounded with one pair of dorsocentral setae (Dc), in ventral view five pairs of ventral setae (V); in lateral view two pair of lateral setae (L), one pair of apical setae (Ap) and one pair of subapical setae (Sa) (Fig. 9).

Comments. The larva of *C. pilosissima* was described by JAMES (1957) in details. Differs from *C. aurifrons* and *C. picta* by the position and number of the anterodorsal setae and by the absence of dorsolateral setae in the first toracic segment. It also presents two bulbous tubercles behind each eye, absents in *C. aurifrons* and *C. picta*. The larva of *C. pilosissima* is also longer than the larva of *C. aurifrons* and *C. picta* with the total length reaching more than 18 mm.

The description of the larva of *C. marginata* made by MCFADDEN (1967) is very incomplete. He only illustrates the first abdominal segment. Differs from *C. picta* by presenting the dorsal (DI) and lateral (L) setae shorter and from *C. aurifrons* by presenting the medium dorsal setae of the first abdominal segment shorter, as well as the pupal horns not so visible. It also differs regarding to the total length of the larva, that is longer (20,1 mm) than those of the two other species (13-15 mm and 16 mm respectively).

IDE (1963a) described in details the larva of *C. leucocephala*. It differs from those *C. aurifrons* and *C. picta* by presenting a single pair of dorsal setae in the first toracic segment and external ventral setae bifurcated (trifurcated in the two other species).

IDE (1967) described in details three larval stages of *C. souzalopesi*. They differs from those of *C. aurifrons* and *C. picta* by presenting in the last larval stage all lateral, dorsolateral and ventrolateral plume-like setae.



Figures 6-10. *Cyphomyia picta*: (1) head and thoracic segments, dorsal view, (2) Head and thoracic segments, ventral view, (3) 5th to 8th abdominals segments, dorsal view, (4) 5th to 8th abdominals segments, ventral view, (5) lateral view of 5th abdominal segment. (a) Antenna, (Ad) anterodorsal seta, (Ap) apical seta, (as) anterior spiracle, (asl) anal slit, (Cf) clypeofrontal seta, (D) dorsal seta, (Dc) dorsocentral seta, (DI) dorsal seta, (L) lateral seta, (Lb) labral seta, (ph) pupal respiratory horn, (Sa) subapical seta, (sp) sternal patch, (V) ventral seta, (VI) ventrolateral seta. Scale = 1 mm.

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