

SHORT COMMUNICATION

Description of immature stages of *Ablabesmyia cordeiroi* Neubern, 2013 (Diptera: Chironomidae: Tanypodinae)

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ABSTRACT

Ablabesmyia cordeiroi Neubern was originally described based on adult males collected in the Amazon region; therefore, females and immatures of this species are unknown. In the present study, the pupal and larval stages of *A. cordeiroi* are described and illustrated. In addition, an amendment to the larval diagnosis of *Ablabesmyia* is provided.

KEYWORDS: aquatic insects, non-biting midges, Pentaneurini, Brazil

Descrição dos estágios imaturos de *Ablabesmyia cordeiroi* Neubern, 2013 (Diptera: Chironomidae: Tanypodinae)

RESUMO

Ablabesmyia cordeiroi Neubern foi descrita originalmente com base em machos coletados na região amazônica, portanto, a fêmea e os imaturos desta espécie são desconhecidos. No presente estudo, os estágios de pupa e larva de *A. cordeiroi* são descritos e ilustrados. Além disso, uma emenda à diagnose da larva de *Ablabesmyia* é fornecida.

PALAVRAS-CHAVE: insetos aquáticos, chironomídeos, Pentaneurini, Brasil

Ablabesmyia Johannsen is the most diverse genus in Tanypodinae, with about 90 species distributed worldwide (Fittkau and Murray 1986; Ashe and O'Connor 2009; Neubern *et al.* 2013). Although *Ablabesmyia* is common and diverse in the Neotropical region, in about 50% of the species the immature stages are unknown, and most of them were described based only on males, which have a conspicuous coloration pattern and complex hypopygial structures. Larvae of the genus are predatory, feeding on smaller chironomid larvae and oligochaetes. They live in a wide variety of aquatic habitats, both lentic and lotic, including at least one species with larva associated with freshwater sponges (Fusari *et al.* 2012) and one living symbiotically with Unionidae mussels (Roback 1982). *Ablabesmyia cordeiroi* Neubern, 2013 was described based only on males collected in Amazonia (Neubern *et al.* 2013). The objectives of this study were to describe the pupal and larval stages of this species. In addition, an amendment to the larval diagnosis of *Ablabesmyia* is provided.

A larva of *A. cordeiroi* was collected associated with aquatic vegetation using a hand net. In the laboratory, the larva was individually reared in a plastic vial and was fed on Chironominae and Orthocladiinae larvae. For further details

on rearing techniques, see Mendes (2002). The emerged adult was kept alive for at least 24 hours to adequately preserve the coloration. It was then fixed in 80% alcohol, together with the pupal and larval exuviae. The specimen examined was slide-mounted in Euparal[®] following the procedures outlined by Pinder (1983, 1986, 1989). The terminology follows Sæther (1980). The types of *A. cordeiroi* in the reference collection of the aquatic entomology laboratory (Laboratório de Entomologia Aquática – LEA) of Universidade Federal de São Carlos – UFSCar (São Carlos, São Paulo, Brazil) were examined to certify the identification of the reared specimen. The reared male specimen and its larval and pupal exuviae are deposited in the Invertebrate Collection of Instituto Nacional de Pesquisas da Amazônia – INPA, Manaus, Amazonas, Brazil (INPA.DIP001955).

Taxonomic treatment

Family: Chironomidae Newman, 1834

Subfamily: Tanypodinae Skuse, 1889

Tribe: Pentaneurini Fittkau, 1962

Genus: *Ablabesmyia* Johannsen, 1905

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Amended diagnosis. The following addition is provided to the generic diagnosis reviewed by Neubern *et al.* (2013):

Larva. At least one species has one bifid claw at apex of posterior parapods.

***Ablabesmyia cordeiroi* Neubern, 2013**

Material examined. Holotype: male, Brazil, Amazonas, Manaus, Cuieiras ZF02, (60°06'55"W, 02°35'22"S), 14.vii.2008, C.S.N. Oliveira (LEIA). Paratypes: two males, same data as holotype. Additional material: one male with pupal and larval exuviae, Presidente Figueiredo, Igarapé da Onça, Recanto da Pantera, (02°00'52"S, 60°01'43"W), 10.xii.2012, G.P.S. Dantas (INPA).

Diagnostic characters. *Pupa:* wing sheath smooth, with brown pigmentation restricted to the edges and some veins; thoracic horn lumen with hexagonal pattern, spines present on the base, aeropyle membranous with a simple tube; genital sac apex rounded beyond the insertion of the second macroseta of the anal lobe. *Larva:* postoccipital margin without projections; basal segment of maxillary palp subdivided into two parts; ligula with anterior row of teeth strongly concave; posterior parapods with one short, bifid claw; all claws of the posterior parapods light yellow.

Pupa (n = 1).

Total length = 2.95 mm (abdomen of male).

Coloration. Thoracic horn dark-brown (Figure 1A); wing sheath whitish, with brown pigmentation restricted to the edges and some veins as in Figure 1B. Abdomen light brown, without distinct spots (Figure 1C).

Cephalothorax. Frontal apotome apically truncated. Wing sheath smooth (Figure 1B), 1088 µm long, 370 µm maximum width. Thoracic horn (Figure 1A) 431 µm long, 198 µm maximum width, lumen with hexagonal pattern, spines present on the base, aeropyle membranous, 25 µm long, 38 µm wide, with a simple tube, outer membrane with spines on the dorsal margin; thoracic comb with 16 teeth.

Abdomen (Figure 1C). TI–VII with large field of shagreen, composed of small spines arranged in transverse rows; TVIII with large field of shagreen formed by small scattered spines; anal lobe with shagreen. TI with a distinct elongated scar, 86 µm long. Segment VII with 4 LS setae. Segment VIII with 5 lateral filaments. Anal lobe as in Figure 1D, 400 µm long, 340 µm wide at base, spiniform at apex; two lateral macrosetae, with adhesive sheath; outer margins with four spines, inner margin without spines. Genital sac 254 µm long, 235 µm wide at base, apex beyond the insertion of the second macroseta of the anal lobe. GS/AL 0.63.

Larva (n = 1).

Coloration. Head capsule yellow; post-occipital margin brown; antenna and maxillary palp yellowish; mandible yellow with brown apex; ligula brown at apex. Abdomen yellowish;



Figure 1. *Ablabesmyia cordeiroi* Neubern, pupa. (A) thoracic horn; (B) wing sheath; (C) abdomen; (D) anal lobe. This figure is in color in the electronic version.

procercus and anal setae yellowish; all claws of posterior parapods light yellow.

Head (Figure 2A). Head capsule oval in shape; total length 715 µm, 473 µm wide, cephalic index 0.66. Chaetotaxy as in Figure 2A. Ventrally, VP closer to S10 than to S9, located posterior to S9, mesial to S10. Ventral scars slender, 60 µm long, distant from each other by 90 µm, distant from the occipital margin by 76 µm. Postoccipital margin without projections (Figure 2A).

Antenna. A₁ 350 µm long, 19 µm maximum width, ring organ placed 205 µm from base.

Maxilla. Basal segment of maxillary palp (Figure 2B) subdivided into 2 parts, basal (P₁) 36 µm long and 12 wide, apical (P₂) 37 µm long and 10 µm wide; ring organ placed 30 µm from base; palpiger small, 16 µm long and 14 µm wide. A₁/P₁ 9.72.

Mandible (Figures 2C–D). Gradually curved and tapered towards apex, 144 µm long; with three lateral setae, ring organ placed 30 µm from base. Apical tooth 47 µm long, mola projection large, blunt-ended and directed apically; inner tooth large, bluntly rounded (Figure 2C), partly overlying seta subdentalis. Seta subdentalis 41 µm long. A₁/MD 2.43.

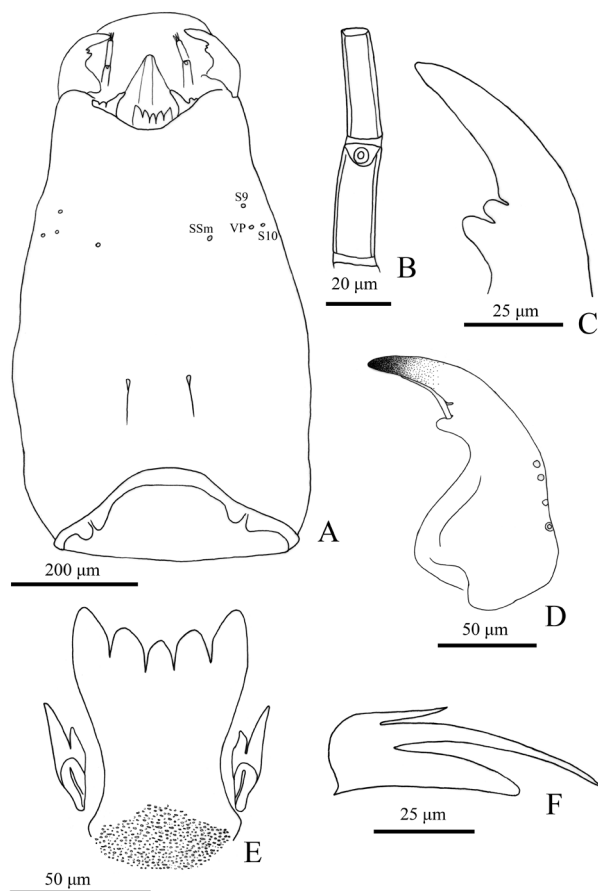


Figure 2. *Ablabesmyia cordeiroi* Neubern, larva. (A) head; (B) maxillary palp; (C) apex of mandible; (D) mandible; (E) ligula and paraligula; (F) bifid claw of posterior parapod.

Mentum and M appendage. Dorsosomal teeth reduced, M appendage rounded apically; pseudoradula 140 µm long, 14 µm wide, uniformly granulated. Labial vesicles 36 µm long, oval-shaped.

Hypopharyngeal complex (Figure 2E). Ligula 91 µm long, 60 µm wide at apex, 41 µm at the middle and 53 µm at the base, with five teeth, anterior row of teeth strongly concave; granulated at base. Paraligula bifid and robust, 37 µm long and 11 µm wide. Pecten hypopharyngis with 13 teeth.

Body. Without fringe of swim-setae. Anterior parapods with simple claws. Procercus 110 µm long, 32 µm wide at base, with seven anal setae, 588 µm long. Supra-anal setae 273 µm long. Sub-basal setae of posterior parapod 200 µm long. Anal tubules not measurable. Posterior parapods with hooklets and 13 simple claws and one shorter claw wide at base and bifid at apex (Figure 2F).

Remarks on systematics

The pupa of *A. cordeiroi* would key to *A. communiba* Neubern in Neubern *et al.* (2013), however, in *A. communiba* the genital

sac is 300-350 µm long and the veins of the wing sheath are complete, while in *A. cordeiroi* the genital sac is about 250 µm long and the veins of the wing sheath are incomplete. In contrast, the larva of *A. cordeiroi* does not key to any couplet in Neubern *et al.* (2013), due to its unique combination of characters, mainly the bifid claw on the posterior parapods (Figure 2F). Considering an initial hypothesis of primary homology, this peculiar character which does not appear in any other known larva of *Ablabesmyia*, should be treated as a plesiomorphy, since it also occurs in all species of *Labrundinia* Fittkau and *Denopelopia* Roback & Rutter, which are genera that were recently recovered as the sister group of *Ablabesmyia* by Krosch *et al.* (2017).

Notes on biology

The larva of *A. cordeiroi* was collected associated with aquatic vegetation in a backwater area of a black-water stream. The species is known only from Amazonas state, Brazil.

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