New species of *Ablabesmyia* Johannsen (Diptera, Chironomidae, Tanypodinae) from the Neotropical Region, with description of male adults and immature stages

Caroline S. N. Oliveira & Alaíde A. Fonseca-Gessner

Departamento de Hidrobiologia, Centro de Ciências Biológicas e da Saúde, Universidade Federal de São Carlos. Caixa Postal 676, 13565-905 São Carlos, São Paulo, Brasil. Email: cneubern@yahoo.com.br; gessner@power.ufscar.br

ABSTRACT. A new species of genus *Ablabesmyia* is described. The larvae were collected associated with aquatic macrophytes in ponds from the Southeast of Brazil. In laboratory, the larvae were reared to obtain pupae and adults.
KEY WORDS. *Ablabesmyia oliveirai* **sp. nov.**; Brazil; taxonomy.

RESUMO. **Nova espécie de *Ablabesmyia* Johannsen (Diptera, Chironomidae, Tanypodinae) da região Neotropical, com descrição do adulto macho e estágios imaturos.** É descrita uma nova espécie do gênero *Ablabesmyia*. As larvas foram coletadas associadas a macrófitas aquáticas de lagoas no Sudeste do Brasil. No laboratório, foram criadas para a obtenção das pupas e adultos.
PALAVRAS-CHAVE. *Ablabesmyia oliveirai* **sp. nov.**; Brasil; taxonomia.

The genus *Ablabesmyia* Johannsen, 1905 is cosmopolitan, except for Antarctica. The genus was established by Johannsen (1905), based on *Tipula monilis* Linnaeus, 1758. It was first treated as a subgenus of *Pentaneura* Philippi, 1865 by Edwards (1927) and Johannsen (1946), called Group A; posteriorly, Freeman (1955) and Roback (1959) yet considering it as a subgenus of *Pentaneura*, but then already bearing the name *Ablabesmyia*. Fittkau (1962) recognized the generic status, thus elevating the subgenus to genus (see also Roback 1971).

None of the eight species described to Neotropics have been recorded from Brazil (see Spies & Reiss 1996, for the catalogue). However the larvae have been recorded from many ecological studies (Trivinho-Strixino & Strixino 1995, Takeda *et al.* 1997, Fonseca-Gessner & Guereschi 2000, Roque *et al*. 2003). Recently, *Ablabesmyia reissi* Paggi & Suarez, 2000 was described from Argentina and *Ablabesmyia electrohispaniolana* Grund, 2005 was described from amber of the Dominican Republic.

Due to the lack of information an all life stages, the identification to species level of the *Ablabesmyia* material is very difficult. The present paper describes and figures all life stages of a new species, *Ablabesmyia oliveirai*.

MATERIAL AND METHODS

The larvae of *Ablabesmyia oliveirai* **sp. nov.** were collected in small body waters of lentic systems in the São Paulo State, Brazil. They were brought to the laboratory and isolated in small vials with water from the place of collection, in order to obtain the associations between larva, pupa and adults as suggested by Mendes (2002).

The material was mounted in Euparal following the procedures outlined by Pinder (1983, 1986, 1989). The thorax and abdomen of the adults were cleared in a 10% KOH solution. The terminology follows those proposed by Saether (1980), Roback (1985), Kowalyk (1985) and Langton (1994); the measurements follow Epler (1988), except for the length of the cephalic capsule of the larva, which was determined by measuring the ventral length from the anterior margin to the post-occipital margin.

The measurements are given as ranges followed by mean when four or more specimens were measured. Measurements are given in µm except when otherwise stated. The type material is deposited at Museu de Zoologia da Universidade de São Paulo (MZSP), São Paulo, Brazil, except for one paratype which is kept at Laboratório de Entomologia Aquática (LEA-UFSCar), Departamento de Hidrobiologia, Universidade Federal de São Carlos, São Paulo, Brazil.

Ablabesmyia oliveirai, sp. nov.

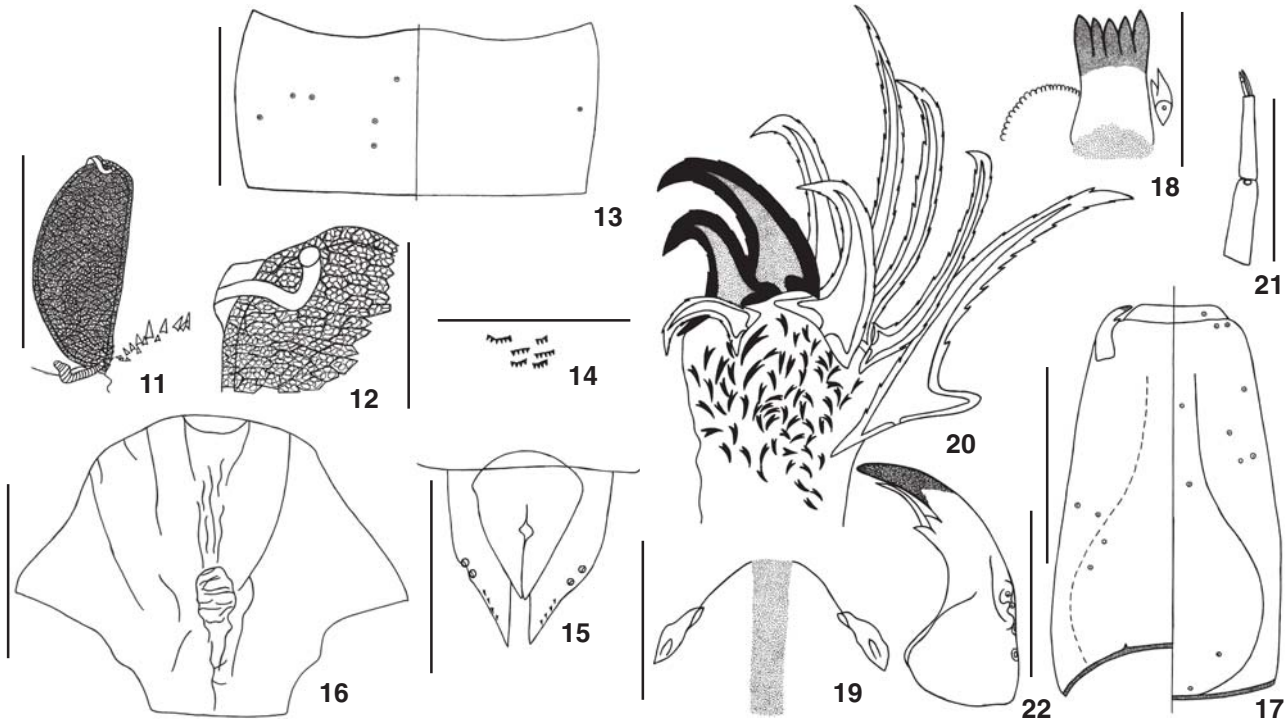
Figs 1-22

Type Material. Holotype (male): Brazil, *São Paulo State*: Luís Antônio (Estação Ecológica de Jataí, Lagoa Piaba), 30/VIII/1995, S. Trivinho-Strixino *leg*. Paratypes: 1 male, same data as holotype; 1 male, same data as holotype except for (Lagoa do Óleo), 25/VII/2003; 1 male, Brotas (Lagoa Dourada), 04/III/2004, L. Correia *leg*.; 1 male with pupal and larval exuviae, São Carlos (represa do Monjolinho), 18/X/2000, L. Correia *leg*. The paratype with the immature stages associated is deposited in the collection of LEA-UFSCar, the rest of the types are deposited in the MZSP.

Figures 1-10. Male adult: (1) thorax; (2) abdomen; (3) wing; (4) spur and three pseudospurs, fore leg; (5) spur, middle leg; (6) spur, hind leg; (7) pigmentation pattern of legs; (8) gonostylus with megaseta and pre-apical seta; (9) hypopygium, ventral left half and dorsal right half; (10) volsellas. (a) fore leg; (b) middle leg; (c) hind leg. The drawing thorax, abdomen, wing and legs are design. Scale: 4-6 and 8-10 = 0.1 mm.

Etymology. The new species is named in memory and honor of Dr. Sebastião José de Oliveira, *in memoriam*, Fundação Nacional do Instituto Oswaldo Cruz, Rio de Janeiro, Brazil, to acknowledge his important contributions to the study of the Brazilian Chironomidae.

Diagnosis. *Ablabesmyia oliveirai* **sp. nov.**, shares with *Ablabesmyia monilis* (Linnaeus, 1758), *Ablabesmyia metica* Roback, 1983 and *Ablabesmyia reissi* Paggi & Suarez, 2000, the spoon-



Figures 11-22. (11-16) Pupa: (11) thoracic horn with basal lobe and medial row of teeth; (12) apex of thoracic horn showing aeropyle tube; (13) setal arrangement on AIV, dorsal right half and ventral left half; (14) shagreen; (15) anal lobe and genital sac; (16) frontal apotome. Scale: 11, 13 and 15 = 0.5 mm; 12, 14 and 16 = 0.1 mm; 17-22. Larva: (17) head capsule, ventral right half and dorsal left half, showing distribution of cephalic setae and pores; (18) ligula with pecten hypopharyngis and paraligula; (19) dorsomental teeth and pseudoradula; (20) some apical claws of posterior parapods; (21) maxillary palp; (22) mandible. Scale: 17 = 0.5 mm; 18-22 = 0.1 mm.

shaped gonostylo megaseta; and with *Ablabesmyia electrohispaniolana* Grund, 2005, the third palpomere longer than the second; but can it be recognized by the combination of middle leg tibia with three spurs, one pectinated, one lyrate and a third, smooth; tarsomere 1 of hind leg with 6-12 spines linearly set along the inner margin and different volsellae; round superior volsella with abundant long terminal filaments, striated long median volsella with round apex, and inferior volsella in S-shaped.

The pupae can be recognized by the shape of the thoracic horn, with distinct reticulate pattern, sinuous aeropyle tube and club-shaped apex; abdominal setae distribution; and shape and pattern of shagreen.

The larvae can be recognized by the concave apices teeth of the ligula, the two-segmented maxillary palps and the posterior parapods with five hooked and two dark brown claws.

Male imago (n = 5).

Abdominal length 3.26-4.50 mm.

General coloration brown. Head and thorax (Fig. 1) brown. Wings (Fig. 3) membrane transparent, veins darker, with 11-13 brownish spots and five dark brown areas around the arculus, R_2 and R_3 and the tranversal veins r-m and m-cu. Legs yellow with brown bands (Fig. 7). Femur I with three to four bands, one sub-basal, one or two median bands and another pre-apical. Femurs II and III with three bands, one sub-basal, one median and another pre-apical. Tibiae I and II with four bands, one sub-basal, two median and one apical. Tibia III with three bands, one sub-basal, one median and another apical. Tarsomeres 1 with two bands, one median and another apical, tarsomeres 2-4 with one apical band and tarsomeres 5 pale. Abdomen pigmented (Fig. 2). Hypopygium yellow (Fig. 9), gonocoxite in apical region brown and gonostylus in basal region brown.

Head. Antennal flagellum = 1.34-1.49 mm, AR = 0.10. Lengths of palpomeres (in µm): 58-87, 101-136, 161-167, 160-167, 330-362. Thorax. Acrostichals divided into 59-60 anterior and 6-10 posterior; 25-35 dorsocentrals; 1 supra-alar; 1 prealar, 8 humerals. Scutellum with 16-28 setae in a double row. Wing. with macrotrichia, Length 1.70-2.35 mm, width 0.50-0.74 mm, WW = 0.29-0.31, costal extension 1.53-2.18 mm, squama with 28-30 setae. Legs. Fore leg: LR_1 = 0.73; tibia with one pectinated spur of 52-67 µm and with three pseudospurs of 70-89, 150-153 and 159-164 µm (Fig. 4), tarsomeres 1 and 2 with two pseudospurs each of 64-72, 70-76, 64-70, 66-71 µm respectively and tarsomeres 3 with one pseudospur of 60-65 µm. Middle legs: LR_2 = 0.88; tibia with three spurs, one pectinated

spur of 59-63 µm, other in lyrated of 37-58 µm and one smooth spur of 29-32 µm (Fig. 5), tarsomeres 1 and 2 with two pseudospurs each of 63-73, 62-70 µm and 65-70, 60-69 µm respectively and tarsomeres 3 with one pseudospur of 63-70 µm. Hind legs: LR_3 = 0.90; tibia with two pectinated spurs of 50-67, 65-89 µm (Fig. 6), tarsomeres 1 with two apical pseudospurs of 75-81, 75-83 µm and 6-12 spines linearly set along its inner margin of tarsomeres, tarsomeres 2 with two pseudospurs of 67-73, 60-72 µm and tarsomeres 3 with one pseudospur of 61-69 µm. Leg measurements and ratios (Tab. I).

Table I. leg. measurements (µm) and ratios for holotype *A. oliveirai* **sp. nov**.

	Fe	Ti	Ta1	Ta2	Ta3	Ta4	Ta5	LR
PI	953	956	706	318	225	156	118	0.73
PII	725	750	662	375	275	276	153	0.88
PIII	693	762	687	387	268	212	125	0.90

Hypopygium (Figs 8-10). Tergite IX 84-93 µm and two or three dorsal setae, gonocoxite 140-200 µm, gonostylus 118-193 µm, megaseta 24-35 µm spoon-shaped, slender pre-apical seta, gc/gs = 1.0-1.1, transverse sternapodeme 25-69 µm, phallapodeme 63-80 µm, superior volsella 53-63 µm, median volsella 26-27 µm, inferior volsella 61-41 µm.

Pupa (n = 1)

General coloration yellowish. Thoracic horn with brownish respiratory atrium.

Cephalothorax. Wing sheath = 1.46 mm, oval thoracic horn (Fig. 11), length 537 µm, width 237 µm, reticulation of atrium respiratory distinct and homogeneous lumen, membranous apical nipple, AN_i = 16 µm, AN_i/TH = 0.029, aeropyle tube sinuate and apex club-shaped (Fig. 12), plastron plate present, basal lobe produced as conical evagination of the tegument, thoracic comb with 14-16 conic teeth, frontal apotome (Fig. 16).

Abdomen. Tergites entirely covered with shagreen, consisting of small spinules in convex arc (Fig. 14). All segments with abundant setae irregularly distributed. AIV (Fig. 13) with D_1 median followed posteriorly by D_3 and D_5 respectively; D_2 lateral to D_4; L_1 posterior to L_2. AV-VII with a small prominence at dorsal surface. AVII with four *taeniae,* position LS_1 = 162 mm of basal region, AVIII with five *taeniae*, position LS_1 = 118 µm of basal region. Anal lobe (Fig. 15) elongate, triangular, length 450 µm, with two *taeniae*, position LS_1 = 231 µm of basal region, inner margins with thin spinules. Genital sac (Fig. 15) elongate, conical, length 375 µm.

4th instar larva (n = 1)

General coloration yellow. Apex of mandible, ligula and postoccipital margin dark brown. Posterior parapods with two brown apical claws and the others yellow (Fig. 20).

Head capsule (Fig. 17). Elongate. I/C = 1.27. Chaetotaxy of cephalic setae as follows: DORSAL (S_1-S_5, S_{11}): S_1 located near anterior margin, S_2 and S_3 located in frontoclypeolabral apotome, S_4 anterior to S_5, both located on frontal apotome, seta coronal S_{11} antero-lateral pore coronal. Lateral (S_6-S_8): S_6 postero-lateral to S_3 followed posteriorly by S_7, S_8 postero-lateral to S_7. Ventral (S_9-S_{10}, SS_m): S_9 antero-lateral to S_{10}. Seta sub-mental SS_m posterior S_{10}. Ventral pore located between S_{10} and SS_m. Dorsal pore near to S_8. Coronal pore located near to postoccipital margin. Antenna: A_1 550 µm, ring organ located 306 µm from base. Maxilla (Fig. 21): maxillary palps with two segments, P_1/P_2 = 1.0, ring organ located in P_1 46 µm from base. Mandible (Fig. 22): length 153 µm, with three lateroventrals setae and one sensilium campaniforme located 118 µm at apice, basal tooth bifide with a seta subdentalis, A1/MD = 3.59. Mentum (Fig. 19): dorsomental teeth, pseudoradula uniformly granulate. Hypopharyngeal complex (Fig. 18): ligula 92 µm, with five teeth forming a concave toothed margin, tooth outcurved, basal third granulose, base as width as teeth width, It/O = 0.91, Mt/O = 0.88; paraligula 35 µm, bifid, pecten hypopharyngis with 21 small teeth in an arc. Abdomen: without lateral fringe, procercus 147 µm; with seven anal setae, length 825 µm; supra-anal setae simple, length 443 µm. Posterior parapods (Fig. 20) with apical claws serrated outer margin, five hooked claws and two dark brown and in region apical with hooklets.

DISCUSSION

Roback (1959) divided the subgenus *Ablabesmyia* into two groups, *monilis* and *illinoensis*. The major differences of the groups is the shape of the megaseta, which is spoon-shaped in the *monilis* group and slender in the *illinoensis* group. Later, in 1971, the same author created two subgenera by grouping the species of these groups, the subgenus *Ablabesmyia* for the *monilis* group and the subgenus *Karelia* for the *illinoensis* group. Roback (1983) proposed the subgenus *Sartaia* based only on adults, for the *A. metica* species from the Neotropical region. And in 1985, he proposed the subgenus *Asayia* for *A. annulata* (Say, 1823).

The division proposed by Roback (1959) and confirmed by Murray & Fittkau (1989), states that the species with spoon-shaped megaseta belong in the subgenus *Ablabesmyia*, yet according to Roback (1985), larvae with two-segmented maxillary palps should be placed in the subgenus *Karelia*. The present species fits both subgenera, considering the larval and adult stages.

The pupae of *Ablabesmyia oliveirai* **sp. nov.** does not readily fit into any of the three subgenera proposed by Roback (1985), *Ablabesmyia*, *Karelia* and *Asayia*, as it shares sinuous aeropyle tube and club-shaped apex with *Ablabesmyia* and respiratory atrium with distinct reticulation with *Karelia*.

A similar problem was reported by Paggi & Suarez (2000) for *Ablabesmyia reissi*. Probably *Ablabesmyia oliveirai* **sp. nov.**, could be better included in the "*reissi* group" proposed by these authors, although the larvae of *A. oliveirai* **sp. nov.** lack the palpiger (membranous portion between P_1 and P_2), characteristic that defines this group.

Ecological notes

The specimens were collected in three ponds and in a reservoir, all of them located in three counties in the central São Paulo State, Brazil. The ponds Piaba and Óleo are located in the Ecological Station of Luís Antônio (21°36'S, 47°48'W), the pond Dourada in the county of Brotas and the Monjolinho reservoir in the county of São Carlos (21°53'S, 47°52'W).

The larvae of *Ablabesmyia oliveirai* were collected associated with aquatic macrophytes of the genera: *Eichhornia, Egeria, Myriophyllum, Scirpus*, and *Cabomba* of shallow lakes (0.4-2.9 m) with well-oxygenated water (6.8-7.2 mgL^{-1}).

The larvae of genus *Ablabesmyia* are predators, feeding on small invertebrates, including other Chironomidae larvae. Generalist insectivore fishes can eat these larvae, for example of *Crenicichla britskii* (Perciformes, Cichlidae) (Gibran *et al*. 2001).

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