

A distinctive new species of *Apobaetis* (Ephemeroptera: Baetidae) from Mato Grosso and Minas Gerais, Brazil

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Abstract

Apobaetis fiuzai (Ephemeroptera: Baetidae), new species, is described based on larvae collected from Mato Grosso and Minas Gerais, Brazil. The new species is distinguished by the lack of robust setae on the anteromedial margin of the labrum; long, three-segmented maxillary palps; basally broad distomedial process of labial palp segment 2; narrow and truncate labial palp segment 3; abundant long, fine, simple setae on outer margin of labial palps segments 2 and 3; and complex abdominal color pattern. The report of *A. fiuzai* extends the range of *Apobaetis* within Brazil.

Key words: Ephemeroptera, Baetidae, *Apobaetis fiuzai*, new species, Mato Grosso, Minas Gerais, Brazil.

Introduction

The Panamerican genus *Apobaetis* Day (Ephemeroptera: Baetidae) is currently known from four species: *A. indepressus* Day, *A. etowah* (Traver), *A. lakota* McCafferty, and *A. signifer* Lugo-Ortiz & McCafferty. Only *A. indepressus* is known from larvae and adults, whereas *A. etowah* is known from adults only and *A. lakota* and *A. signifer* are known from larvae only (Day 1955; Waltz & McCafferty 1986; Lugo-Ortiz & McCafferty 1997; McCafferty 2000). Although it has been hypothesized that *Apobaetis* has a Neotropical origin (Lugo-Ortiz & McCafferty 1997; McCafferty 1998), *A. signifer* is the only species reported from the Neotropics, while *A. indepressus*, *A. etowah*, and *A. lakota* are known only from North America north of Mexico. Little is known about the biology of *Apobaetis*, except that larvae of *A. indepressus* are found in swift currents on sandy substrates and can tolerate relatively poor water quality and high temperatures (Day 1955).

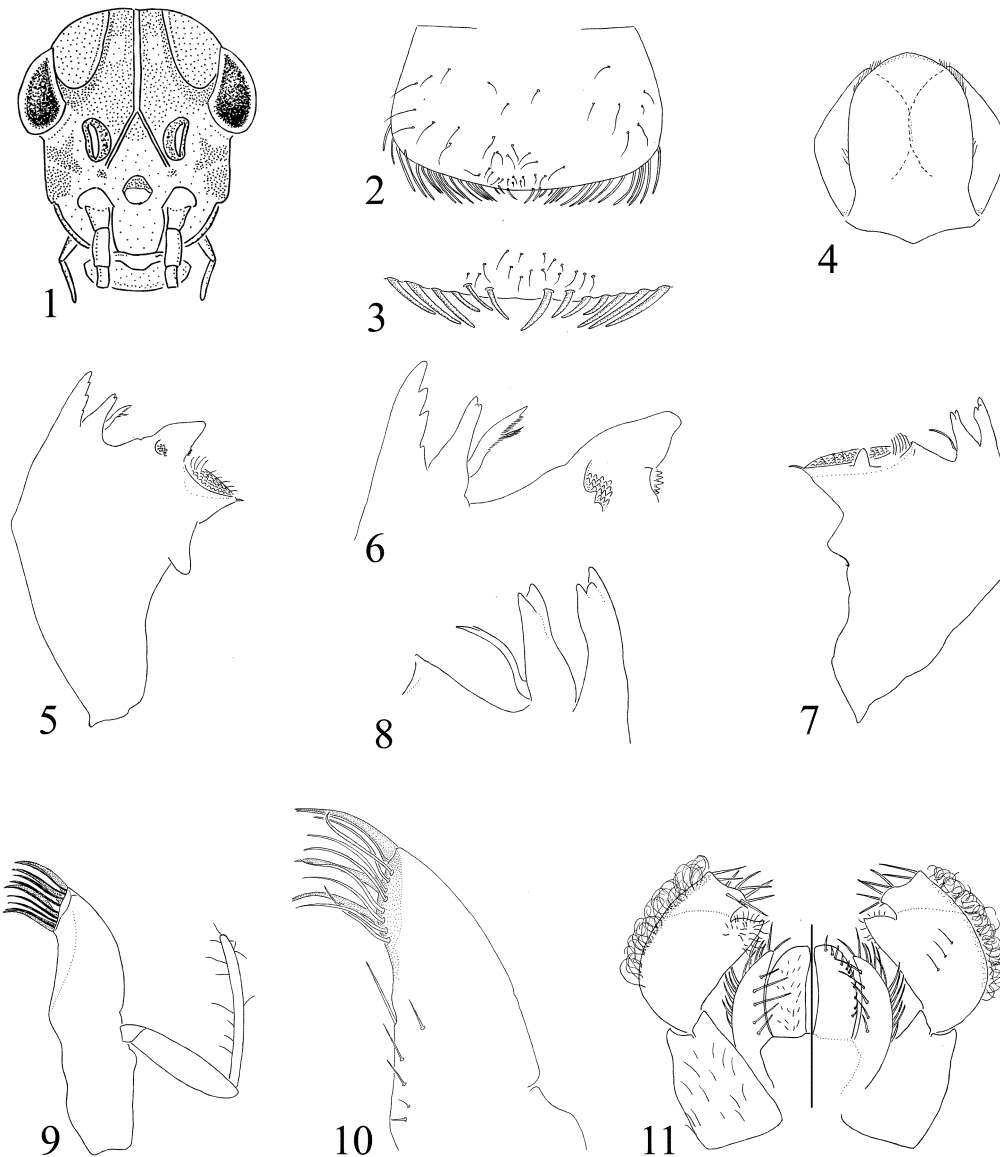
In this study, we describe a distinct new species of *Apobaetis* based on larvae collected from Mato Grosso and Minas Gerais, West-central and Southwest Brazil, respectively. The report of the new species is important because it constitutes the second representative of *Apobaetis* described from the Neotropical region and significantly extends the range of the genus to the south-southeast within Brazil.

***Apobaetis fiuzai* Salles & Lugo-Ortiz, sp. n.**

Larvae. Body length: 3.5-4.8 mm. Caudal filaments length: 1.8-2.2 mm.

Head (Fig. 1) cream, with medium to dark brown markings. Lateral ocelli medium brown, medial ocellus dark brown. Compound eyes black, protruding; turbinate portion yellow, with brown borders. Frontal keel absent. Labrum (Figs. 2, 3) without anteromedial excavation; anterior margin with row of long, robust, simple, pointed setae, progressively diminishing in length and disappearing towards midregion; dorsal surface covered with short, fine and long, fine simple setae. Hypopharynx as in Figure 4. Left mandible (Figs. 5, 6) with basally cleft incisors; outer and inner incisors respectively with four and three denticles; protheca robust, bifid, both prongs apically pointed, with minute setae medially; triangular process at base of mola well developed, with small denticles near base of mola. Right mandible (Figs. 7, 8) with incisors basally cleft; outer and inner incisors respectively with three and two denticles; protheca single, elongate and robust; triangular process at base of mola poorly developed; robust, apically rounded process in midregion of mola. Maxillae (Figs. 9, 10) with four falcate denticles and row of approximately eight long, robust, pointed, simple setae on apex of galealaciniae; apical half of medial margin with approximately six pointed setae of different lengths; palps three-segmented; segment 1 short; segment 3 narrow, nearly 1.3x length of segment 2, sparsely covered with long, fine, simple setae marginally. Labium (Fig. 11) with palp segment 1 approximately 0.80x length of segments 2 and 3 combined, with sparse long, fine, simple setae; segment 2 with acute distomedial process, basally broad, covered with fine, simple setae of various lengths, and with dorsal row of three long, robust, simple, pointed setae; segment 3 narrow, apically truncate, covered with long, robust, pointed, simple setae; outer margin of segments 3 and apical 3/4 of outer margin of segment 2 densely covered with long, fine, simple setae; paraglossae narrower than glossae, apically narrow, outer margin and mediodorsal and ventral surfaces respectively with one row of long, robust, pointed setae; glossae dorsally with row of short, robust, pointed, simple setae on outer margin, slightly increasing in length towards apex, ventrally with short, fine, simple setae.

Thorax cream, with medium and dark brown markings, without distinct pattern. Hind-wing pads absent. Legs (Fig. 12) pale cream, long and narrow; femur anteriorly with round pale brown marking; femur, tibia, and tarsi without markings, ventrally with robust, pointed setae of various lengths, dorsally with sparse short, fine, simple setae; foretarsal claws nearly 0.65x length of foretarsi.

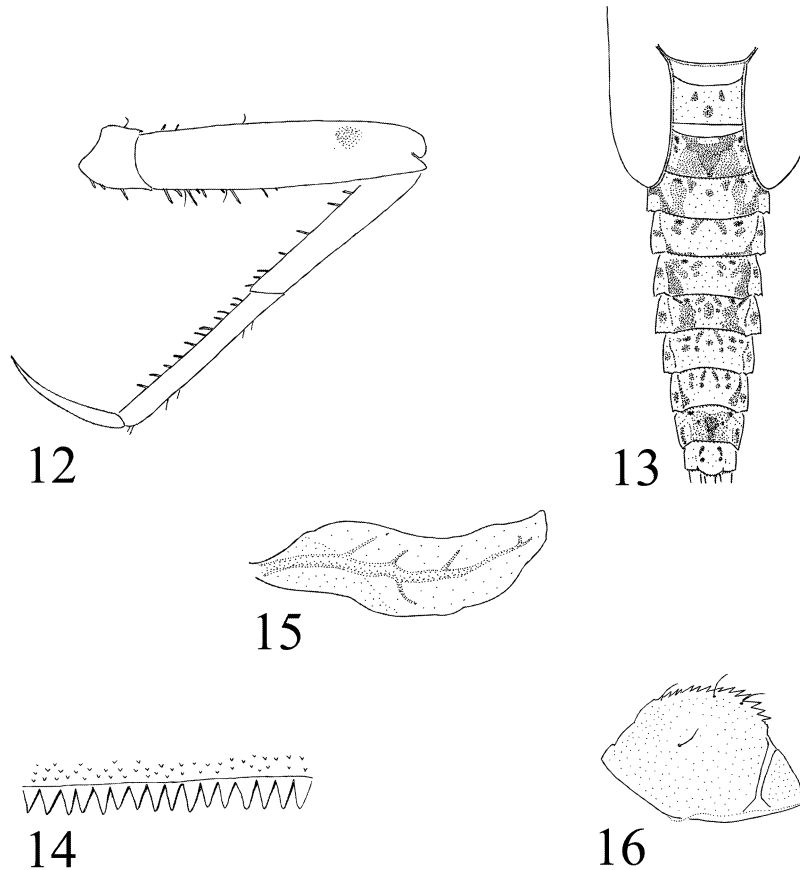


FIGURES 1-11. *Apobaetis fiuzai*, sp. n., larva. 1. Head (frontal). 2. Labrum (dorsal). 3. Labrum (dorsal - detail of anterior margin). 4. Hypopharynx. 5. Left mandible. 6. Left mandible (detail of incisors and triangular process). 7. Right mandible. 8. Right mandible (detail incisors). 9. Maxilla. 10. Maxilla (detail of galealacinia). 11. Labium (left-ventral; right-dorsal).

Abdomen (Fig. 13) cream, with complex medium and dark brown markings. Terga (Fig. 14) densely covered with minute spines, posteriorly with uniform sharp spines. Gills (Fig. 15) narrow-elongate, with conspicuous tracheation, reaching or extending beyond third subsequent tergum. Paraproct (Fig. 16) covered with minute spines and with few

long, fine, simple setae, marginally with 16 spines, progressively increasing in size towards apex. Caudal filaments cream in basal half and medium brown in apical half, apical half with one cream segment every three brown segments.

Adults. Unknown.



FIGURES 12-16. *Apobaetis fiuzai*, sp. n., larva. 12. Foreleg. 13. Abdominal color pattern. 14. Tergum 4 (detail of posterior margin). 15. Gill 4. 16. Paraproct.

Type material. Holotype: Female larva, Brazil, Minas Gerais, Córrego Danta, Fazenda Prata, Rio da Prata, 19° 45.29'S / 46° 5.53'W, small stones near river margin, slow current, shallow, 9/VIII/2001, C. R. Lugo-Ortiz and F. F. Salles. Paratypes: Nine larvae, same data as holotype. All types are housed in the Laboratório de Entomologia da Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil.

Additional material: Larva, Brazil, Minas Gerais, Arinos, Mont Serrat, Rio Paraibúna, sand, 28/VI/2000, N. Ferreira, Jr.; larva, Brazil, Minas Gerais, Descoberto, Cachoeira da Fumaça, marginal vegetation, 2/VIII/1997, C. N. Francischetti; larva, Brazil, Mato Grosso, Chapada dos Guimarães, Cachoeira do Pulo, 21/II/2000, C. N. Francischetti and M. S.

Baptista. All specimens are housed in the Laboratório de Entomologia da Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil.

Etymology. We are honored in naming this species after Paulo Sérgio Fiuza Ferreira, for his considerable help during one of the collecting trips and for his contributions to the field of entomology in Brazil.

Discussion

Apobaetis fiuzai can be distinguished from *A. signifer*, the other species of *Apobaetis* known from South America (Lugo-Ortiz & McCafferty 1997), by the following combination of characteristics: anteromedial region of labrum without robust setae (Figs. 2, 3); long, three-segmented maxillary palps (Fig. 9); labium with distomedial process of palp segment 2 basally broad and segment 3 narrow and truncate, with long, robust, simple setae apically (Fig. 11); labial palps segments 2 and 3 with abundant long, fine, simple setae on outer margin (Fig. 11); and more complex abdominal color pattern (Fig. 13).

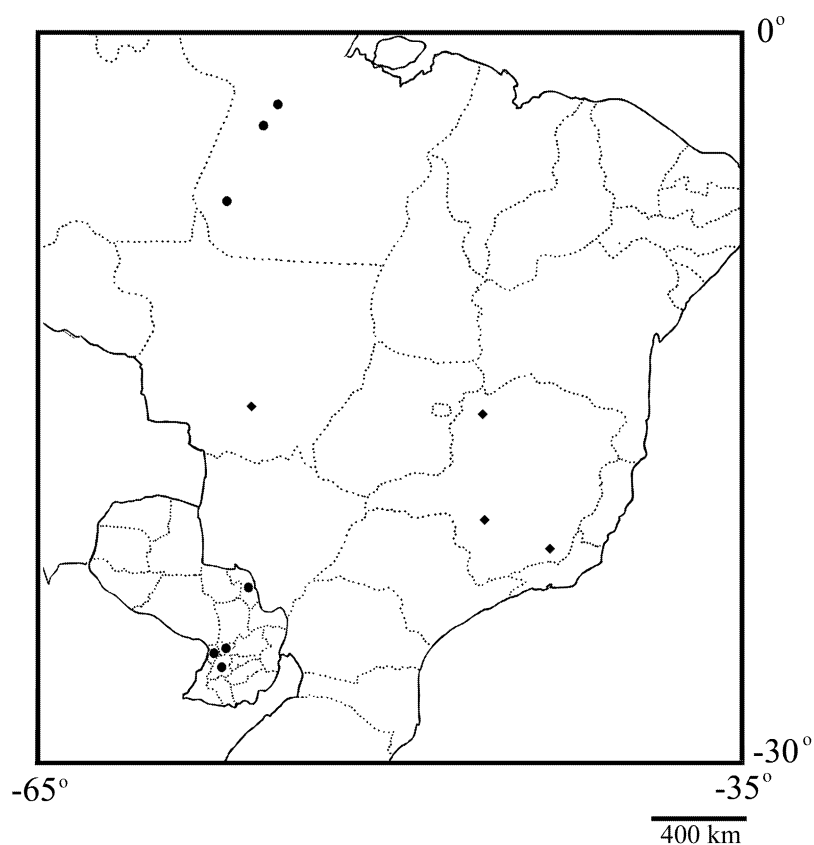


FIGURE 17. Distribution of *A. fiuzai* and *A. signifer* in Brazil and Paraguay. Diamond, *A. fiuzai*; closed circle, *A. signifer*.

Apart from representing the second species of *Apobaetis* from the Neotropics, *A. fiuzai* constitutes the first report of the genus from the West-central and Southwest regions of Brazil (Fig. 17). *Apobaetis signifer* is known from sparse localities in the state of Pará in northern Brazil and Paraguay (Fig. 17; Lugo-Ortiz & McCafferty 1997). Thus, although expected, *A. fiuzai* extends the range of the genus within Brazil. It is possible that *A. fiuzai* and *A. signifer* co-occur in central Brazil, as their present distributions suggest (Fig. 17).

Larvae of *A. fiuzai* were collected among small stones (pebbles) and from marginal vegetation in shallow areas with slow current and relatively low temperatures. Some specimens, however, were collected from sandy bottoms. These data expand the known ecology of *Apobaetis*, restricted to Day's (1955) comments on the collecting data of *A. independentus* (see Introduction).

Acknowledgements

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