

A new species of two-tailed *Camelobaetidius* (Insecta, Ephemeroptera, Baetidae) from Espírito Santo, southeastern Brazil

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ABSTRACT: *Camelobaetidius rufiventris* sp. nov. is described based on nymphs from Alfredo Chaves, state of Espírito Santo, southeastern Brazil. This species differs from the other described species of the genus based on the following combination of characteristics: tarsal claws with 35–41 denticles; small thoracic gill at base of fore coxa; prosternum with reduced, single, medial protuberance; paraproct with eight marginal pointed spines; terminal filament reduced. Besides *C. rufiventris*, *C. anubis* and *C. francischettii* are also reported from the state of Espírito Santo. Based on these three species, the genus *Camelobaetidius* is recorded for the first time from this state.

Key words: aquatic insects, taxonomy.

RESUMO: Uma espécie nova de *Camelobaetidius* com dois filamentos terminais (Insecta, Ephemeroptera, Baetidae) do Espírito Santo, sudeste do Brasil. *Camelobaetidius rufiventris* sp. nov. é descrita com base em ninfas coletadas no município de Alfredo Chaves, estado do Espírito Santo, sudeste do Brasil. Ela difere das demais espécies descritas do gênero pela seguinte combinação de características: garras tarsais com 35–41 denticulos; pequena osmobrânquia presente na base da coxa anterior; prosterno com protuberância mediana reduzida; paraprocto com oito espinhos marginais agudos; filamento terminal reduzido. Além de *C. rufiventris*, *C. anubis* e *C. francischettii* são também registradas no Espírito Santo. Com base nessas três espécies, o gênero *Camelobaetidius* é relatado pela primeira vez no estado.

Palavras chave: insetos aquáticos, taxonomia.

Introduction

Camelobaetidius Demoulin is a pan-American genus of Baetidae (Insecta: Ephemeroptera) distributed from Argentina (Traver & Edmunds, 1968) to

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Received: 26 Aug 2008. Accepted: 17 Feb 2009.

Canada (Lehmkuhl, 1976), with its highest diversity in South America, where 28 of a total of 38 valid species are recorded (Domínguez *et al.*, 2006; Salles & Serrão, 2005).

Although a phylogenetic analysis of *Camelobaetidius* has not been performed, the species of this genus can be divided into three morphological groups: 1) four species (including the type-species *C. leentvaari* Demoulin) with the terminal filament reduced and with a projection on the inner margin of the fore femora; 2) three species with the terminal filament reduced and without a projection on the inner margin of the fore femora; and 3) thirty one species with the terminal filament almost as long as cerci. Based on collections and material from several regions in Brazil, we have verified that the latter species group is much richer than the current number of described species indicates, and is one of the most ubiquitous mayflies in rapids of rivers and streams in Brazil.

The aim of the present paper is to describe one of the new species of *Camelobaetidius* with the terminal filament reduced and without a projection on the inner margin of the fore femora. Two additional species collected at the type locality of the new species are also reported for the first time from the state of Espírito Santo.

Methods

The mayflies were collected from April to December 2007 in the stream Nova Estrela, at the locality of Nova Mantova, municipality of Alfredo Chaves, state of Espírito Santo, Brazil, 20°39'22.6"S 40°50'12.9"W 380 m altitude. Specimens were stored in 80% ethanol and the material is housed at the Entomological Collection of Universidade Federal do Espírito Santo (UFES).

Results and Discussion

Camelobaetidius rufiventris Boldrini & Salles, sp. nov.

(Figures 1–12)

Holotype: female nymph, BRAZIL, Espírito Santo, Alfredo Chaves, Nova Mantova, Nego Boldrini Farm, Nova Estrela stream, 20°39'22.6"S 40°50'12.9"W, 23.IX.2007, R. Boldrini col. (UFES). **Paratypes:** two nymphs, same data as holotype; six nymphs, same data as holotype, except 28.V.2007.

Diagnosis: *Camelobaetidius rufiventris* can be distinguished from the other described species of the genus by the following combination of characters: tarsal claws with 35–41 denticles (Figure 9); small thoracic gill at base of fore coxa; prosternum with reduced, single, medial protuberance; paraproct with eight marginal pointed spines (Figure 12); terminal filament reduced (Figure 1).

Description. Nymph: Body length: 3.2–5.2 mm. Caudal filaments length: 2.5–3.0 mm. **Head** (Figure 1): General coloration brown, vertex brown, with yellowish white spots; male with turbinate portion of compound eyes dark reddish brown. Antennae brown-translucent. Labrum anterodorsally with eight to nine fine, moderately long, simple setae in each side of midline, and several simple setae scattered over surface (Figure 2). Incisors of left mandible with five denticles (Figure 3); prostheca apically denticulate; minute and spine-like setae between prostheca and subtriangular process present. Incisors of right mandible with five denticles (Figure 4); prostheca apically denticulate; minute, spine-like setae, between prostheca and mola present. Hypopharynx as in Figure 5. Maxillae (Figure 6) with one fine, simple setae; palp segment one cylindrical. Labium (Figure 7) with glossae with six fine, simple setae medially, and six fine, simple setae distally; paraglossae little longer than glossae, apically with two rows of long, apically pectinate setae, dorsally with two robust, simple setae; segment two of labial palp with distomedial process rounded, inner margin with fine, simple setae, and dorsally with five, fine, simple setae; segment three scattered with few acute setae over surface. **Thorax** (Figure 1): Pro- and mesonotum brown, with light brown and dark brown marks as in Figure 1. Metanotum brown. Pleura and sterna reddish. Prosternum with reduced, single, medial protuberance. Legs with one small thoracic gill at base of fore femora; femora light brown with yellowish white spots (Figure 1), ventral margin scattered with spines, dorsal margin with row of long, robust, simple setae (Figure 8); tibia light brown with yellowish white spots; ventral margin scattered with few short spines, dorsal margin with abundant, fine, simple setae, apex with 10–11 spine-like setae, indentation at apex absent; tarsi light brown, with five spines medially, one row of short spines apically, and one simple, long, setae near apex; tarsal claws with 35 to 41 denticles (Figure 9). **Abdomen** (Figure 1). General coloration dark reddish brown, segment IV with yellowish white mark, segment V yellowish white with margins reddish brown. Sterna reddish brown. Posterior margin of terga with truncate spines (Figure 10). Gills (Figure 11) with trachea unpigmented, margins light brown. Paraproct with eight marginal pointed spines (Figure 12). Terminal filament little longer than last abdominal segment. Cerci light brown. **Adults:** Unknown.

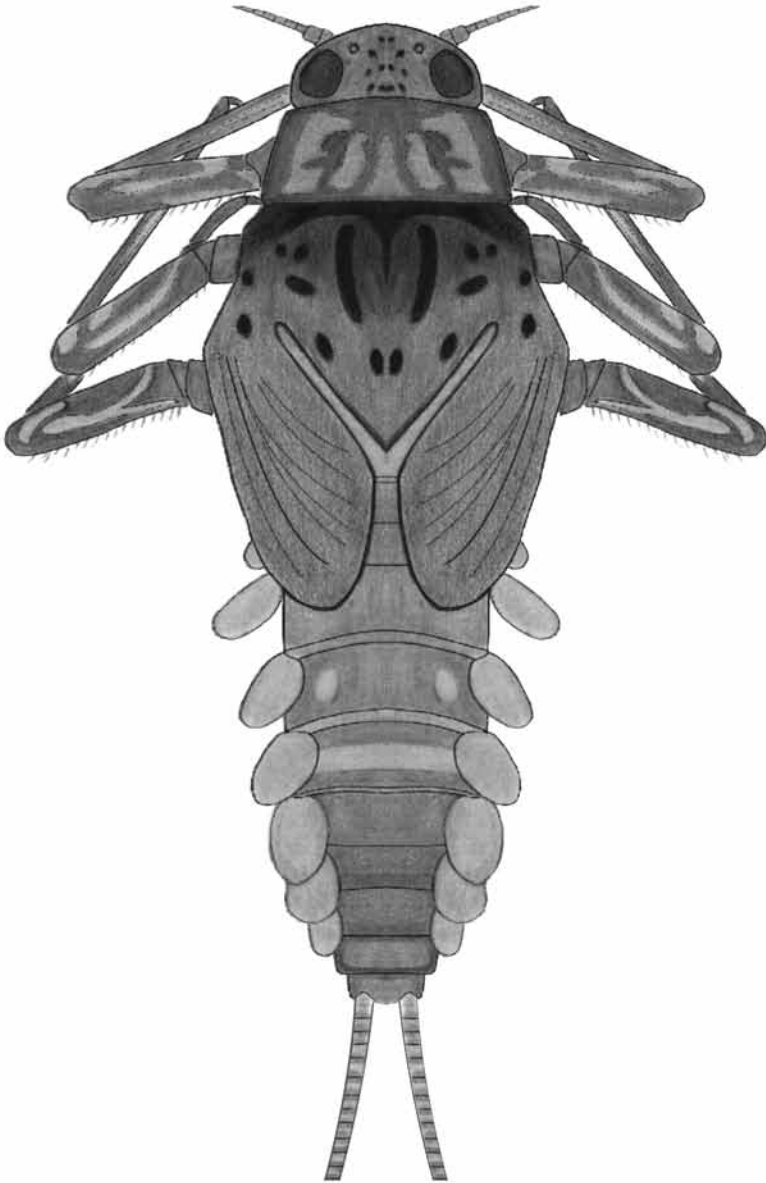
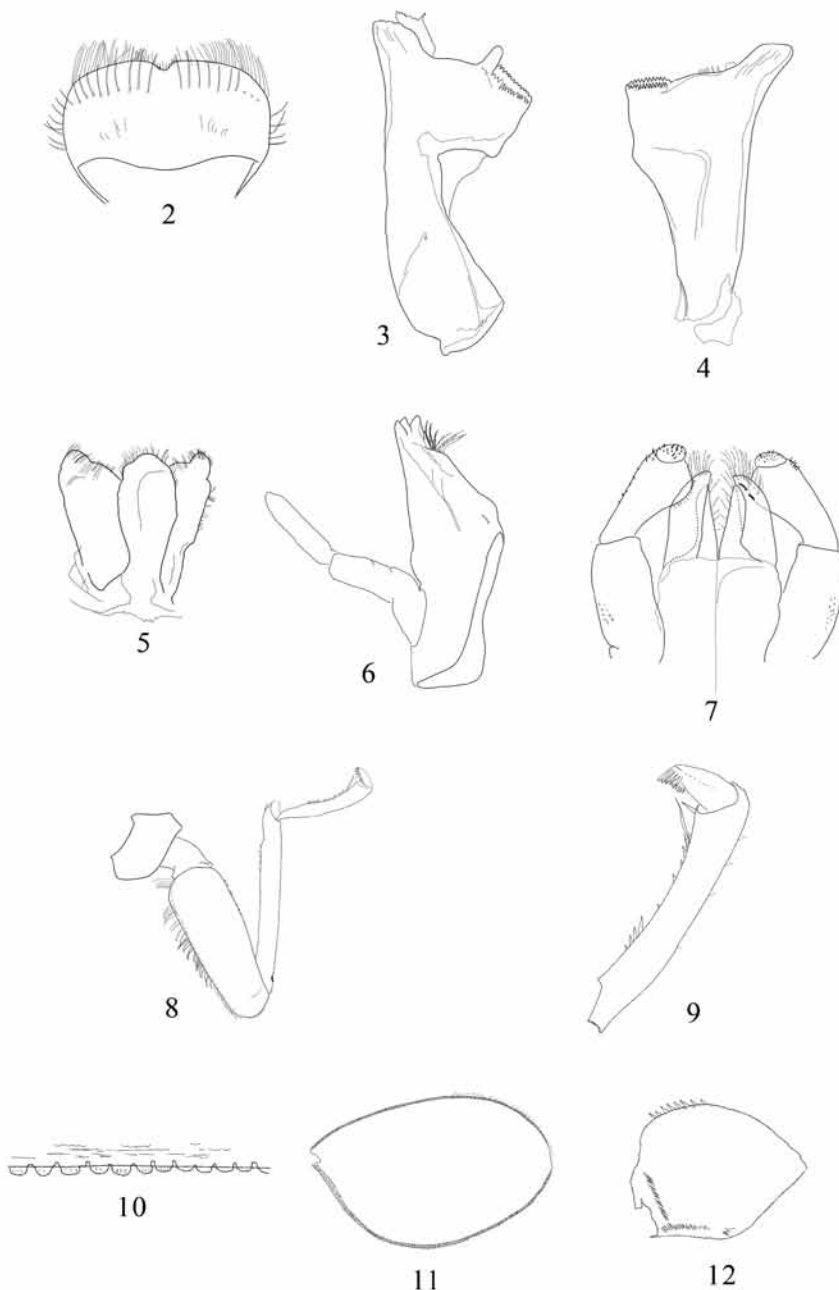


Figure 1. *Camelobaetidius rufiventris*: general habitus of nymph.



Figures 2–12. *Camelobaetidius rufiventris* nymph: **2)** Labrum (dorsal); **3)** Left mandible; **4)** Right mandible; **5)** Hypopharynx; **6)** Maxillae; **7)** Labium (left = dorsal, right = ventral); **8)** Foreleg; **9)** Detail of tarsus and tarsal claw; **10)** Tergum 4 (detail of posterior margin); **11)** Gill 4; **12)** Paraproct.

Etymology: The name of the species is due to the reddish coloration of thoracic and abdominal sterna.

Distribution: Known only from Alfredo Chaves, state of Espírito Santo, Brazil.

Remarks: *Camelobaetidius rufiventris* is the fourth described species of the genus (together with *C. billi* Thomas & Dominique, *C. apis* Nieto, and *C. maranhensis* Salles & Serrão) which presents the unique combination of characters such as the terminal filament reduced, and the absence of a projection on the inner margin of the fore femora. In the keys proposed for the South American (Dominguez *et al.*, 2006) or Brazilian (Salles & Serrão, 2005) species of *Camelobaetidius*, *C. rufiventris* would key as *C. billi* and/or *C. apis*. However, nymphs of *C. rufiventris* can be distinguished from them by the number of denticles on the tarsal claws, 35 to 41 versus 30 to 31 in *C. billi* and *C. apis*, and by the presence and shape of spines on the paraproct, present and pointed in *C. rufiventris* versus present and truncate in *C. billi* and absent in *C. apis*. The reddish brown coloration of thoracic and abdominal sterna may also help in the distinction of the new species.

***Camelobaetidius anubis* (Traver & Edmunds, 1968)**

Material examined: BRAZIL, Espírito Santo, Alfredo Chaves, Nova Mantova, Nego Boldrini Farm, Nova Estrela stream, 20°39'22.6"S 40°50'12.9"W, five nymphs, 13.VII.2007, R. Boldrini col. (UFES).

Remarks: This species, known from nymphs and male imago, is the most widespread species of the genus. The known distributional range of *C. anubis* includes the states of Paraná, Santa Catarina, São Paulo, Minas Gerais and Rio de Janeiro in Brazil (Traver & Edmunds, 1968; Salles *et al.*, 2003, 2004), and Argentina (Nieto, 2003). Its presence in the State of Espírito Santo was expected.

***Camelobaetidius francischettii* Salles, Andrade & da Silva, 2005**

Material examined: BRAZIL, Espírito Santo, Alfredo Chaves, Nova Mantova, Nego Boldrini Farm, Nova Estrela stream, 20°39'22.6"S 40°50'12.9"W, seven nymphs, 28.v.2007, R. Boldrini col. (UFES). Two

nymphs, same data, except 08.VI.2007; two nymphs, same data, except 13.VII.2007.

Remarks: *C. francischettii* was described based solely on nymphs from the states of Alagoas and Rio de Janeiro in Brazil (Salles *et al.*, 2005). Its presence in the state of Espírito Santo was also expected.

Acknowledgements

We thank M. T. Tavares and C. O. Azevedo for logistic support and valuable comments on earlier drafts of the manuscript. Logistic support was also provided by Instituto da Biodiversidade (IBIO) and Fundação de Apoio à Ciência e Tecnologia do Espírito Santo (FAPES). Two anonymous reviewers provided valuable comments that improved the quality of the manuscript.

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