

## Redescription of *Camelobaetidius leentvaari* Demoulin, 1966 from Suriname and Brazil [Ephemeroptera, Baetidae]

by Frederico F. SALLES\*<sup>1</sup>, Sueli M. PEREIRA\*\* & José E. SERRÃO\*\*\*

\*Universidade Federal de Viçosa. Museu de Entomologia,  
Departamento de Biologia Animal, Viçosa, Minas Gerais, Brasil

\*\*Universidade Federal do Rio de Janeiro. Museu Nacional do Rio de Janeiro,  
Departamento de Entomologia, Rio de Janeiro, Brasil

\*\*\*Universidade Federal de Viçosa. Departamento de Biologia Geral,  
Viçosa, Minas Gerais, Brasil

<sup>1</sup> Correspondent (ffsalles@gmail.com)

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*Camelobaetidius leentvaari* Demoulin, 1966 is redescribed, based on the type material from Suriname, and two additional larvae from the State of Amapá, Northern Brazil. The species can be distinguished from the other known species of *Camelobaetidius* by the following characteristics : (1) segment 2 of labial palp with distomedial margin rounded and strongly produced ; (2) fore femur with prominent protuberance ; (3) fore tibia with indentation at apex ; (4) anteroventral/inner margin of fore femur and fore tibia entirely scattered with spines ; (5) tarsal claws with 17 to 23 denticles ; (6) a small thoracic gill present at base of fore leg ; (7) prosternum with a single, medial protuberance ; and (8) terminal filament as long as the length of the 10<sup>th</sup> abdominal segment.

**Redescription de *Camelobaetidius leentvaari* Demoulin, 1966 du Surinam et du Brésil**  
[Ephemeroptera, Baetidae]

Mots clés : *Camelobaetidius*, redescription, larve au dernier stade, Surinam, Brésil.

*Camelobaetidius leentvaari* Demoulin, 1966 est redécrit sur la base du matériel typique du Surinam et de deux larves supplémentaires de l'Etat d'Amapá, Brésil Septentrional. L'espèce peut être distinguée des autres espèces connues de *Camelobaetidius* par les caractéristiques suivantes : (1) second segment du palpe labial à bord distomédial arrondi et fortement saillant ; (2) fémur 1 avec une forte protubérance ; (3) apex du tibia 1 avec une indentation ; (4) marge ventrale du fémur 1 et du tibia 1 entièrement couverte d'épines ; (5) griffes tarsales portant de 17 à 23 denticules ; (6) une petite branchie thoracique à la base de la patte 1 ; (7) prosternum avec une protubérance médiane ; et (8) paracérque vestigial.

**Redescrição de *Camelobaetidius leentvaari* Demoulin, 1966 do Suriname e Brasil** [Ephemeroptera, Baetidae]

Palavras-chave : *Camelobaetidius*, redescricao, larva de último estágio, Suriname, Brasil.

*Camelobaetidius leentvaari* Demoulin, 1966 é redescrita com base no material tipo do Suriname e em duas larvas coletadas no Estado do Amapá, Brasil. A espécie pode ser diferenciada das demais espécies de

*Camelobaetidius* pelas seguintes características : (1) processo distomedial do segundo artigo do palpo labial arredondado e fortemente pronunciado ; (2) fêmures anteriores com uma proeminente protuberância ; (3) ápice das tíbias anteriores fendido ; (4) margem ventral dos fêmures e tíbias anteriores inteiramente cobertas por espinhos ; (5) garras tarsais com 17 a 23 denticulos ; (6) pequena brânquia torácica presente na base das pernas anteriores ; (7) proesterno com uma protuberância mediana ; e (8) filamento mediano do comprimento do décimo segmento abdominal.

### 1. Introduction

In the last few years, the knowledge regarding the genus *Camelobaetidius* Demoulin, 1966 (Ephemeroptera : Baetidae) increased considerably in South America. Besides the description of several new species (LUGO-ORTIZ & MCCAFFERTY 1999 ; DOMINIQUE et al. 2001, 2002 ; DOMINIQUE & THOMAS 2002 ; THOMAS et al. 2003a, b ; NIETO 2002, 2003, Salles et al. in press), and unknown winged stages (NIETO 2003 ; SALLES & DIAS 2004), many species were redescribed and/or had their distribution range expanded (NIETO 2003 ; THOMAS et al. 2003a).

However, some species of *Camelobaetidius* remain poorly known. Among them, *Camelobaetidius leentvaari* Demoulin, 1966, the type-species of the genus, is a perfect example. Since its original description by DEMOULIN (1966), based on six larvae from Suriname, nothing was added to its knowledge. Many characteristics, considered important to separate the species of *Camelobaetidius* in subsequent works (e.g. TRAVER & EDMUNDS 1968), were overlooked by Demoulin, making difficult even the correct identification of *C. leentvaari*.

In the present work, intending to contribute with recent works dealing with *Camelobaetidius* in South America, we present the redescription of *C. leentvaari*. This redescription is based on the type material and on two other larvae collected in the State of Amapá, Northern Brazil. The material from Brazil is deposited in the Entomological Collection of the Instituto Nacional de Pesquisas da Amazônia (INPA), Amazonas, Brazil.

### 2. *Camelobaetidius leentvaari* Demoulin, 1966 : redescription

Larva. Body length (female last-instar larva) : 6.1 mm. Caudal filaments length : unknown.

#### HEAD

Yellow-brown, with no distinct color pattern.

Labrum (Fig. 1) with anterodorsal row of eight to nine fine, moderately long, simple setae in each side of midline, and several simple setae scattered over surface.

Hypopharynx as in Fig. 2.

Left mandible (Figs 3, 4) : set of incisors with six denticles ; prostheca robust, apically denticulate and relatively well developed ; six minute, spiniform setae, sometimes apically bifid, between prostheca and mola.

Right mandible (Figs 5, 6) : set of incisors with six denticles ; prostheca apically denticulate and robust, but narrower than left prostheca ; six minute, spiniform setae, sometimes apically bifid, between prostheca and mola.

Maxillae (Fig. 7) with three plus one fine simple setae on medial hump ; palp segment 1 slightly produced medially.

Labium (Figs 8, 9) : glossae with seven to eight fine, simple setae medially, and five to six fine setae distally ; paraglossae longer than glossae, apically with two rows of long, fine setae, and dorsally with two robust, simple setae ; segment 2 of labial palp with distomedial margin rounded and strongly produced, with several fine, simple setae, and with a dorsal row of four long, fine simple setae ; segment three scattered with spiniform setae over surface.

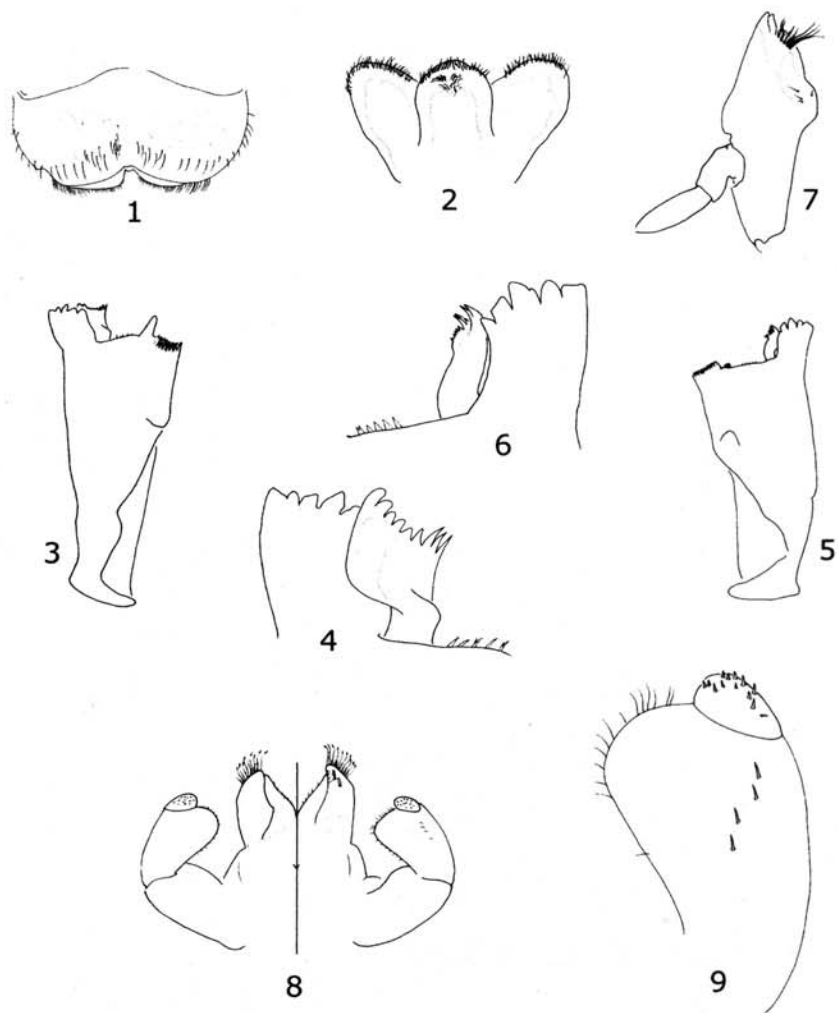


Fig. 1-9. *Camelobaetidius leentvaari*, last-instar larva. 1. Labrum (dorsal). 2. Hypopharynx. 3. Left mandible. 4. Left mandible (detail of incisors and prosthema). 5. Right mandible. 6. Right mandible (detail of incisors and prosthema). 7. Maxilla. 8. Labium (left-ventral; right-dorsal). 9. Labium (detail of palp segments 2 and 3).

Fig. 1-9. *Camelobaetidius leentvaari*, larve au dernier stade. 1. Labre (vue dorsale). 2. Hypopharynx. 3. Mandibule gauche. 4. Mandibule gauche (détail des lobes incisifs et de la prosthema). 5. Mandibule droite. 6. Mandibule droite (détail des lobes incisifs et de la prosthema). 7. Maxille. 8. Labium (à gauche-vue ventrale; à droite-vue dorsale). 9. Labium (détail des segments 2 et 3 du palpe).

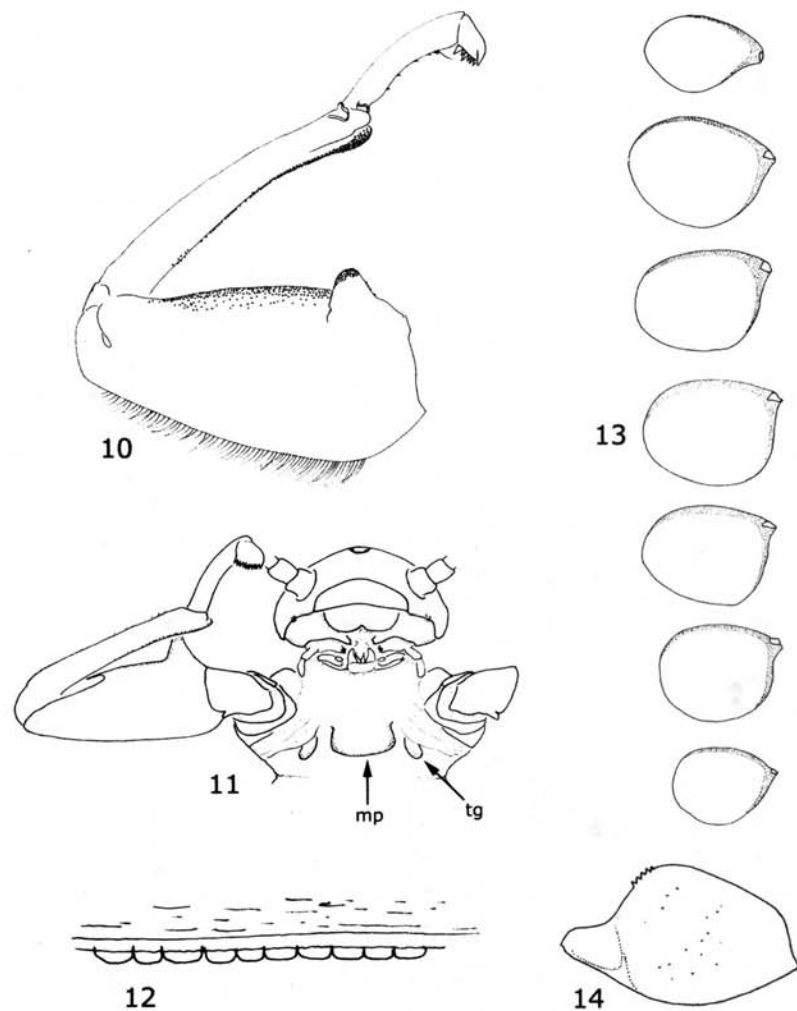


Fig. 10-14. *Camelobaetidius leentvaari*, last-instar larva. 10. Foreleg. 11. Thorax (ventral view of prosteronum, setae indicating: mp, medial protuberance; tg, thoracic gill). 12. Tergum 4 (detail of posterior margin). 13. Gills I-VII. 14. Paraproct.

Fig. 10-14. *Camelobaetidius leentvaari*, larve au dernier stade. 10. Patte antérieure. 11. Thorax (vue ventrale du prosteronum, indication des flèches: mp, protubérance médiane; tg, branchie thoracique). 12. Tergum 4 (détail du bord postérieur). 13. Branchies I-VII. 14. Paraprocte.

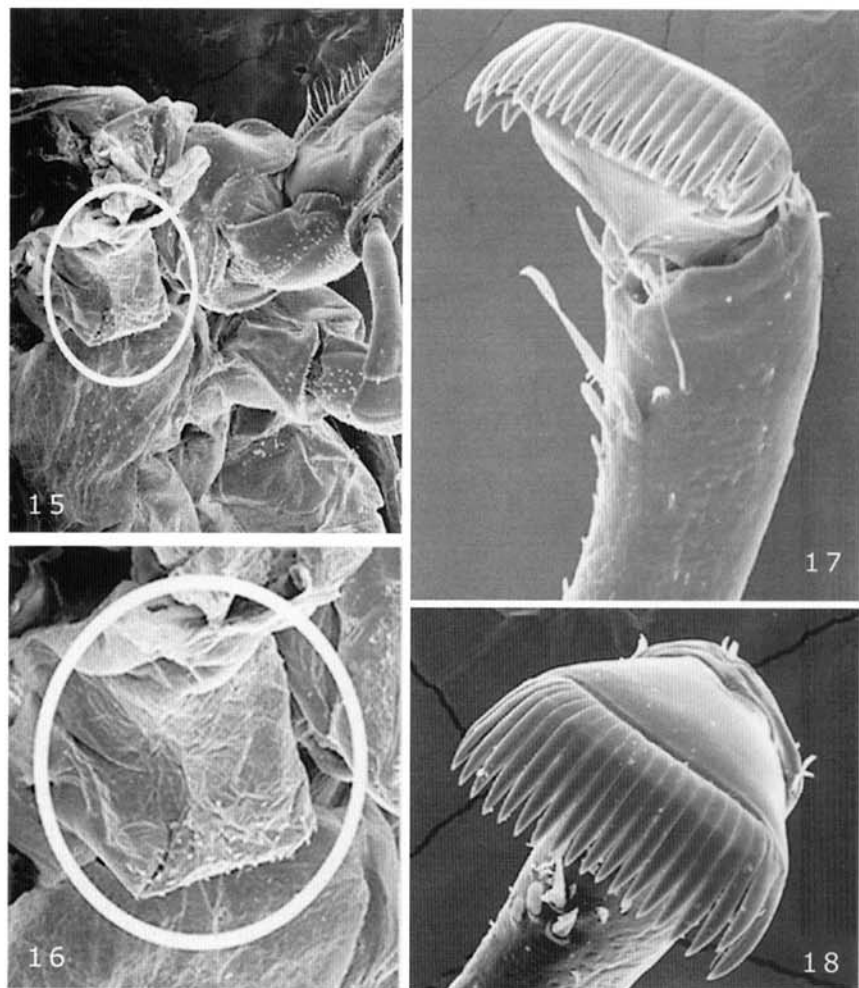


Fig. 15-18. *Camelobaetidius leentvaari*, last-instar larva, SEM photographs. 15. Thorax (ventral view of prosternum, white circle indicating medial protuberance). 16. Thorax (detail of ventral view of prosternum, white circle indicating medial protuberance). 17. Detail of fore tarsal claw. 18. Detail of mid tarsal claw.

Fig. 15-18. *Camelobaetidius leentvaari*, larve au dernier stade, photographies SEM. 15. Thorax (vue ventrale du prosternum, cercle blanc indiquant la protubérance médiane). 16. Thorax (détail de la vue ventrale du prosternum, cercle blanc indiquant la protubérance médiane). 17. Détail de la griffe tarsale antérieure. 18. Détail de la griffe tarsale moyenne.

#### THORAX

Yellow-brown, with no distinct color pattern.

Hind wingpads present.

Legs (Figs 10, 11, 17, 18) with anteroventral margin of fore femora presenting a prominent protuberance near base and entirely scattered with spines, posterodorsal margin with a row of long, robust, simple setae; femora without shagreen areas; fore tibia with inner/ventral margin entirely scattered with spines, with indentation at apex, and abundant, fine, simple setae on outer/dorsal margin; concave margin of fore tarsi with row of ten to eleven apically pointed, simple setae, and one long, fine, simple seta; tarsal claws with 17 to 23 denticles; a small thoracic gill present at base of fore leg (Fig. 11); mid and hind femora and tibiae similar to fore legs, except by the lack of protuberance, indentation, and spines along anteroventral and inner/ventral margins.

Prosternum with single, medial protuberance (Figs 11, 15, 16).

#### ABDOMEN

Yellow-brown, without distinct color pattern.

Posterior margin of terga (Fig. 12) with truncate spines; terga without shagreen areas.

Gills (Fig. 13) untracheated, whitish, darker marginally; gills I and VII smaller than others but not vestigial.

Paraproct (Fig. 14) with five to six small marginal spines, no shagreen areas.

Terminal filament approximately the length of segment ten.

#### Material examined

Holotype: Suriname, at Djoemoe, rapide Tapawatra, 14/VIII/1964, larva, five slides containing mouth parts, legs, gills I-VII, fore and hind wing pads, body.

Paratypes: same data as holotype, four larvae in alcohol.

Additional material: Brazil, State of Amapá, Laranjal do Jarí, Cachoeira Santo Antônio, 24/VI/2001, N. Hamada leg., two larvae.

### 3. Discussion

*Camelobaetidius leentvaari* can be distinguished from the other known species of the genus by the following characteristics: (1) segment 2 of labial palp with distomedial margin rounded and strongly produced; (2) fore femora with prominent protuberance; (3) fore tibia with indentation at apex; (4) anteroventral margin of fore femur and fore tibia entirely scattered with spines; (5) tarsal claws with 17 to 23 denticles; (6) a small thoracic gill present at base of fore leg; (7) prosternum with a single, medial protuberance; and (8) terminal filament as long as the length of the 10<sup>th</sup> abdominal segment.

Five other species of *Camelobaetidius*, all from South America, also have their terminal filament reduced: *C. apis* Nieto, 2003 and *C. ipaye* Nieto, 2003 from Argentina, *C. billi* Thomas & Dominique in DOMINIQUE et al. 2001 from French Guiana and Brazil, *C. francischettii* Salles et al. in press, and *C. mantis* Traver & Edmunds, 1968 from Brazil (TRAVER & EDMUNDS 1968, DOMINIQUE et al. 2001, NIETO 2002, SALLES & DIAS 2004, SALLES et al. in press). *C. ipaye*, *C. francischettii* and *C. mantis* also present the prominent protuberance near the base of the fore femora and an indentation at the apex of the fore tibiae, indicating that *C. leentvaari* and these three species are possibly closely related. The presence of the medial protuberance in the prosternum, and the small gill at the base of the fore legs, distinguish *C. leentvaari* from these species, except *C. fran-*

*cischettii*. The number of denticles on the tarsal claws may also be useful to differentiate *C. leentvaari* (with 17-23 denticles) from *C. ipaye* (30-31) and from *C. francischettii* (34-37), but not from *C. manis* (ca. 25 on the type material, only one immature larva, according to TRAVER & EDMUNDS 1968 ; 19-20 on specimens of the Thomas-Dominique collection, same body length as the type - 3 mm - : A. Thomas & Y. Dominique, pers. comm.).

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#### References

- DEMOULIN, G. 1966. Contribution à l'étude des Epheméroptères du Surinam. *Bulletin de l'Institut Royal des Sciences Naturelles de Belgique*, **42** (37) : 1-22.
- DOMINIQUE, Y., C. MATHURIAU & A. THOMAS. 2002. Etude systématique du genre *Camelobaetidius* Demoulin, 1966 en Colombie (Ephemeroptera, Baetidae). *Bulletin de la Société d'Histoire Naturelle de Toulouse*, 2001, **137** : 17-32.
- DOMINIQUE, Y., A. THOMAS, K. ORTH & C. DAUTA. 2001. Les Ephémères de la Guyane Française. 2. *Camelobaetidius billi* et *C. janae* n. spp (Ephemeroptera, Baetidae). *Ephemera*, 2000, **2** (1) : 39-48.
- DOMINIQUE, Y. & A. THOMAS. 2002. Les Ephémères de la Guyane Française. 5. Description de *Camelobaetidius ortzi* n. sp. (Ephemeroptera, Baetidae). *Ephemera*, 2001, **3** (1) : 27-32.
- LUGO-ORTIZ, C.R. & W.P. McCAFFERTY. 1999. An unusual new species of *Camelobaetidius* (Ephemeroptera : Baetidae) from Paraguay. *Entomological News*, **110** (4) : 221-224.
- NIETO, C. 2002. Primeira cita del género *Camelobaetidius* (Ephemeroptera : Baetidae) para Bolivia, com la descripción de una especie nueva. *Revista de la Sociedad Entomológica Argentina*, **61** (1-2) : 57-61.
- NIETO, C. 2003. El género *Camelobaetidius* (Ephemeroptera : Baetidae) en la Argentina. *Acta Zoológica Mexicana (Nueva Serie)*, **88** : 233-255.
- SALLES, F.F. & L.G. DIAS. 2004. Descrição dos adultos de *Camelobaetidius billi* (Ephemeroptera, Baetidae). *Iheringia*, **94** (3) : 209-210.
- SALLES, F.F., M.B. ANDRADE & E.R. DA-SILVA. *Camelobaetidius francischettii* : a new species of Baetidae (Ephemeroptera) from Brazil. *Zootaxa*. In press.
- THOMAS, A., Y. DOMINIQUE & V. HOREAU. 2003a. Les Ephémères de la Guyane Française. 7. Redescription de *Camelobaetidius cayumba* (Traver & Edmunds, 1968) (Ephemeroptera, Baetidae). *Ephemera*, 2001, **3** (2) : 117-122.
- THOMAS A., N. PERU & V. HOREAU. 2003b. Les Ephémères de la Guyane Française. 8. Description de *Camelobaetidius matlei* n. sp. et clé de détermination des espèces guyanaises de ce genre (Ephemeroptera, Baetidae). *Ephemera*, 2001, **3** (2) : 123-133.
- TRAVER, J.R. & G.F. EDMUNDS Jr. 1968. A revision of the Baetidae with spatulate-clawed nymphs (Ephemeroptera). *Pacific Insects*, **10** (3-4) : 629-677.

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