

**A new species of *Notalina* Mosely, 1936 (Trichoptera: Leptoceridae)  
from Chapada dos Veadeiros National Park, Goiás state, Brazil**

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**Abstract:** The endemic Neotropical long-horned caddisfly subgenus *Notalina* (*Neonotalina*) Holzenthal contains nine described species in two species groups, the *brasiliانا* and *roraίma* groups, from the Brazilian Southeastern and Amazonian regions, respectively. In this paper, a new species of *Notalina* in the *brasiliانا* species group, from Chapada dos Veadeiros National Park, Goiás state, Brazil, is described and illustrated. The new species is easily recognized by the following character set: presence of two pairs of processes on abdominal segment X; presence of well-developed basoventral protuberances, mesally directed in ventral view; presence of triangle-shaped, acuminate mesoventral process on the inferior appendages; and phallic apparatus with flanges slightly curved in dorsal view, not laterally directed.

**Keywords:** *caddisflies*, *description*, *Hudsonemini*, *Neotropical*, *taxonomy*.

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**Resumo:** O subgênero neotropical *Notalina* (*Neonotalina*) Holzenthal contém nove espécies descritas em dois grupos de espécies, *brasiliانا* e *roraίma*, provenientes do Sudeste brasileiro e da região Amazônica, respectivamente. Neste artigo, uma nova espécie de *Notalina* é descrita e ilustrada a partir de espécimes colecionados no Parque Nacional da Chapada dos Veadeiros, Goiás, Brasil. A nova espécie é facilmente diagnosticada pelo seguinte conjunto de caracteres: presença de dois pares de processos no segmento abdominal X; presença de protuberâncias basoventrais bem desenvolvidas, mesalmente direcionadas em vista ventral; presença de processo mesoventral acuminado, com formato triangular no apêndice inferior, e aparato fálico com extensões laterais levemente curvadas em vista dorsal, não direcionadas lateralmente.

**Palavras-chave:** *descrição*, *Hudsonemini*, *Neotropical*, *taxonomia*, *tricópteros*.

## Introduction

Leptoceridae Leach 1815 is a cosmopolitan family of caddisflies containing 1,567 described species, making it the second largest family in the order Trichoptera after the Hydroptilidae (1,677 species) in known species richness (Morse 2003). In the Neotropics, there are 13 described leptocerid genera in two subfamilies, seven genera in the Leptocerinae Ulmer (*Achoropsyche* Holzenthal, *Amphoropsyche* Holzenthal, *Brachysetodes* Schmid, *Nectopsyche* Müller, *Neoathripsodes* Holzenthal, *Oecetis* McLachlan, and *Trienodes* McLachlan) and six genera in the Triplectidinae Kolenati (*Amazonatolica* Holzenthal & Pes, *Atanatolica* Mosely, *Grumichella* Müller, *Hudsonema* Mosely, *Notalina* Mosely, and *Triplectides* Kolenati).

The genus *Notalina* was erected by Mosely (1936) for three Australian species, *Notalina parkeri* (type species), *N. delicatula* (Ulmer) 1908, and *N. flava* (Ulmer) 1908. Since then, 24 species have been described in two subgenera, *N. (Notalina)* and *N. (Neonotalina)* Holzenthal from the Australian and Neotropical regions, respectively. Since the first three species of *Notalina (Notalina)*, 12 additional species have been described: *N. arena* St. Clair 1991, *N. bifaria* Neboiss 1977, *N. dwellinga* Neboiss 1982, *N. fulva* Kimmins 1953, *N. gungara* Neboiss 1984, *N. moselyi* Kimmins 1953, *N. nigra* (Mosely) 1953, *N. ordina* St. Clair 1991, *N. pseudodelicatula* Neboiss 1982, *N. salina* St. Clair 1991, *N. spira* St. Clair 1991, and *N. tillyardi* Kimmins 1953. Of these taxa, immature stages have been described for seven species (*N. arena*, *N. fulva*, *N. ordina*, *N. salina*, *N. spira*, *N. parkeri*, and *N. tillyardi*) by St. Clair (1991). In the Neotropical subgenus, there are nine described species: *N. brasiliana* Holzenthal 1986, *N. morsei* Holzenthal 1986, *N. cipo* Holzenthal 1986, *N. hamiltoni* Holzenthal 1986, *N. roraima* Holzenthal 1986, *N. nanay* Holzenthal 1986, *N. matthiasi* Holzenthal 1986, *N. paulista* Calor & Holzenthal 2006, and *N. froehlichii* Calor & Holzenthal 2006. Holzenthal (1986) recognized two groups of Neotropical species (*roraima* and *brasiliana* groups), and this hypothesis was corroborated by the cladistic analysis of Calor et al. (2006).

Recently, Calor & Froehlich (2008) described the immature stages of *Notalina morsei*, the first description of the larvae of *N. (Neonotalina)* subgenus, and provided an updated key to known larvae of Neotropical Leptoceridae genera. In this paper, a new species of *Notalina (Neonotalina)* Holzenthal 1986 from Chapada dos Veadeiros National Park, Goiás state, Brazil is described and illustrated.

## Material and Methods

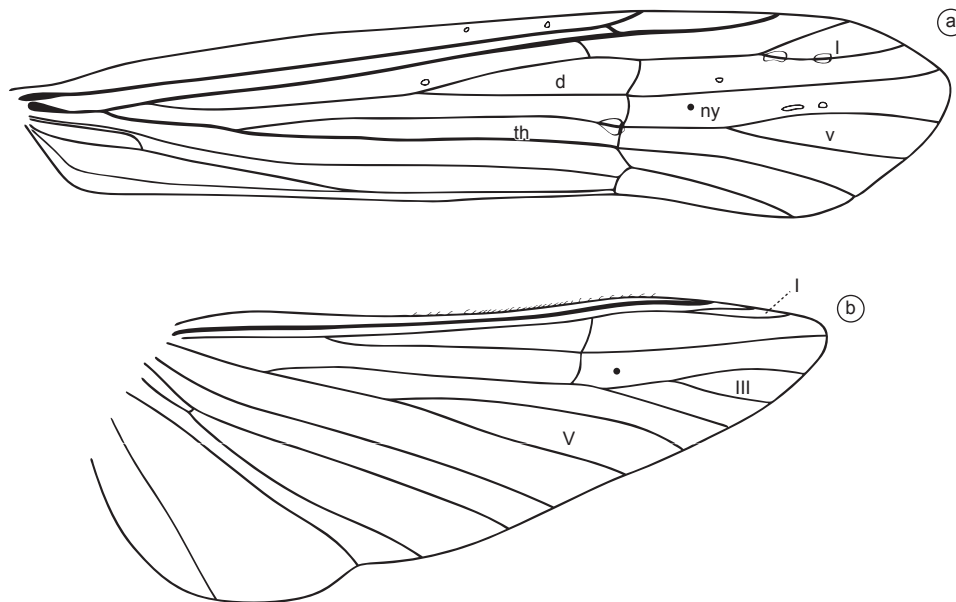
The specimens were collected at Chapada dos Veadeiros National Park, a reserve located in the Northern Goiás state (13° 51' to 14° 10' S and 47° 25' to 47° 42' W), Brazil. The natural vegetation of this reserve is characterized by a predominance of forest formations at low elevations and Cerrado with rupestrian areas at high elevations. The specimens will be deposited in Museu de Zoologia, Universidade de São Paulo, Brazil (MZSP), as discussed in the "Material examined" section.

Methods used in the collection, preparation, examination, illustration, and description of the species were those discussed by Holzenthal & Andersen (2004) and Blahnik & Holzenthal (2004). The morphological terminology used in this paper follows that described and figured by Schmid (1980) and used by Holzenthal (1986) and Calor et al. (2006).

*Notalina goianensis* n. sp. (Figures 1-2)

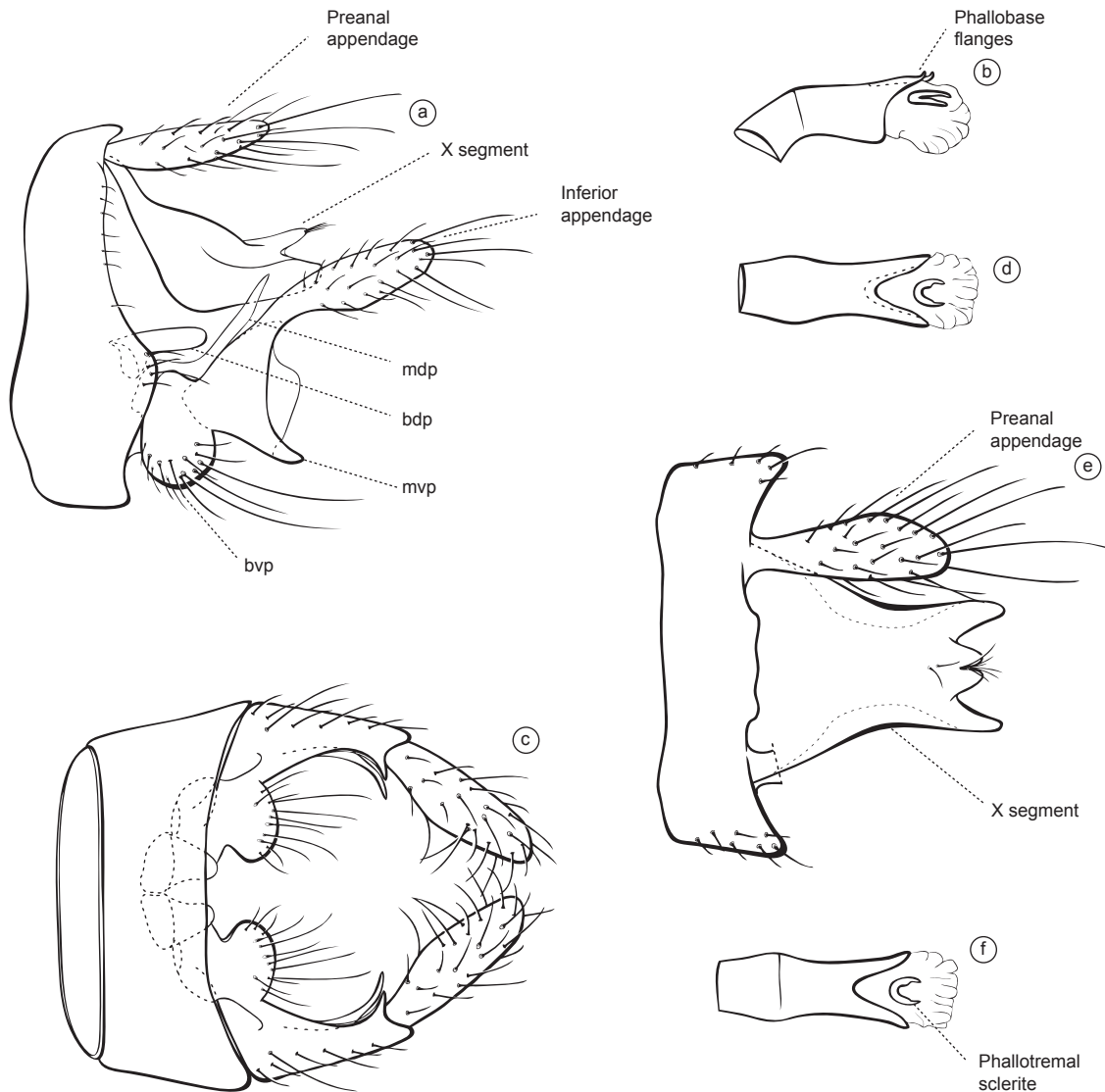
As in other species of the *brasiliana* species group, the new species of *Notalina* can be recognized by the presence of lateral, acuminate flanges on the male phallobase and well-developed phallosclerites. The new species can be distinguished by elongate mesodorsal process, acuminate mesoventral processes; well-developed basoventral protuberances, setose and mesally directed in ventral view; and by having the flanges of the phallic apparatus slightly curved in dorsal view.

Male: Color brown to dark brown, with small white wing spots (specimens in alcohol). Tibial spur formula 2,2,4. Wing venation as in



**Figure 1.** *Notalina goianensis* Calor, new species. Male wings: a) Forewing; and b) Hind wing. The small white wing spots are show as weak trace. The abbreviations d and th refer to discoidal and thyridial cells, ny to nygma, and the numbers I, III and V denote forks I, III and V, respectively.

**Figura 1.** *Notalina goianensis* Calor, espécie nova. Asas do macho: a) Asas anteriores; e b) Asas posteriores. As manchas brancas pequenas são indicadas com leve tracejado. As abreviações d e th referem-se às células discoidal e tiridial, ny à nygma e os números I, III e V denotam forquilhas I, III e V, respectivamente.

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**Figure 2.** *Notalina goianensis* Calor, new species. Male genitalia: a) Abdominal segments IX and X, without the phallic apparatus, lateral view; b) Phallic apparatus, lateral view; c) Abdominal segments IX and inferior appendages, ventral view; d) Phallic apparatus, ventral view; e) Abdominal segments IX and X, without a preanal appendage, dorsal view; and f) Phallic apparatus, dorsal view. The abbreviations bvp,.mvp, bdp, mdp denote basoventral protuberance, mesoventral process, basodorsal process and mesodorsal process, respectively.

**Figura 2.** *Notalina goianensis* Calor, espécie nova. Genitália masculina: a) Segmentos abdominais IX e X, vista lateral (aparato fático excluído); b) Aparato fático, vista lateral; c) Segmento abdominal IX e apêndice inferior, vista ventral; d) Aparato fático, vista ventral; e) Segmentos abdominais IX e X, vista dorsal (apêndice pré-anal esquerdo excluído); e f) Aparato fático, vista dorsal. As abreviações bvp,.mvp, bdp, mdp denotam protuberância basoventral, processo mesoventral, processo basodorsal e processo mesodorsal, respectivamente.

Figure 1. Forewing length 7.0-9.5 mm (N = 8), forks I and V present, a lucid area between the veins Sc and  $R_2$ . Hindwing forks I, III and V present, fork I very narrow. Genitalia as in Figure 2. Abdominal segment IX annular, broadest ventrolaterally, with pair of small dorsal expansions and setae on lateral border. Segment X saddle-like, bearing pair of broadly digitate ventrolateral processes apically and pair of digitate, setose dorsomesal processes. Preanal (or superior) appendage long, about 2/3-length of segment X, setose, slightly clavate. Inferior appendage with apical portion elongate, digitate, setose; basal portion bearing various processes: short, flat, apically rounded basodorsal process; long, slender mesodorsal process, its apex narrowed, dorso-medially directed; well-developed, rounded,

setose, basoventral protuberance, its mesal border extended mesad in ventral view; and long, triangular, acuminate mesoventral process. Phallic apparatus with phallic apodeme and phallobase well developed; phallobase with pair of acuminate flanges, its apex dorsally, not laterally, directed; phallotremal sclerite developed mesad, but smaller than that of *N. brasiliensis*, roughly U-shaped in dorsal view, apex acuminate.

Female: Color similar to male (specimens in alcohol). Tibial spur formula 2,2,4. Forewing length 6.0-7.5 mm (N = 4), forks I, III and V present. Hindwing forks I, III and V presents, fork I very narrow. Genitalia and wings venation not distinguishable from those of *N. brasiliensis*, thus not figured here.

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Immatures: Unknown.

Material examined: Holotype: male, BRAZIL: Goiás state, Chapada dos Veadeiros National Park, Alto Paraíso, Ribeirão Água Fria, 14° 05' 26.3" S and 47° 29' 38.5" W, 1225 m, 16.xii.2006 (Bispo, Yokoyama & Paciencia) (MZSP). Paratypes: 4 males and 4 females, BRAZIL: Goiás state, Chapada dos Veadeiros National Park, Alto Paraíso, Ribeirão Água Fria, 16.xii.2006 (Bispo, Yokoyama & Paciencia) (MZSP); 3 males, BRAZIL: Goiás state, Chapada dos Veadeiros National Park, Alto Paraíso, Loquinhas, 14° 08' 40.1" S and 47° 29' 18.6" W, 15.xii.2006 (Bispo, Yokoyama & Paciencia) (MZSP).

Etymology: This specific epithet, *goianensis*, refers to the Brazilian state of Goiás, where Chapada dos Veadeiros National Park is situated, and also the state of origin of the collector of this material, Dr. Pitágoras Bispo.

## Discussion

As discussed in the species description, *N. goiansensis* is placed in the *brasiliana* species-group by the presence of lateral, acuminate flanges on the male phallobase and well-developed phallosclerites, both synapomorphies of this clade (Holzenthall 1986, Calor et al. 2006). The new species is most similar to *N. brasiliana* due to the presence of two pairs of processes on abdominal segment X and by the complex nature of the basal half of the inferior appendage in the male genitalia. Unlike *N. brasiliana*, the new species has the dorsomesal processes of segment X small, ½ the length of the ventrolateral processes, the basoventral protuberances well-developed, mesally directed in ventral view, the mesoventral process acuminate, triangle-shaped on the inferior appendages, the flanges of phallic apparatus slightly curved in dorsal view, not laterally directed, unlike *N. brasiliana*. The phallosclerite is small in the first too.

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