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## Research article

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# New species of *Notalina* Mosely, 1939 (Trichoptera: Leptoceridae) from Chapada Diamantina National Park, Northeast Brazil, with new records of other leptocerids from the Caatinga biome

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**Abstract.** The genus *Notalina* Mosely, 1939 contains 29 species divided into two subgenera: *Notalina* (*Notalina*) Mosely, 1939, which includes 15 endemic species from Australia and Tasmania, and *Notalina* (*Neonotalina*) Holzenthal, 1986, which comprises 14 species exclusively from South America. In Brazil, eleven species have been recorded, with the main distribution areas in the Cerrado and Atlantic Forest biomes of the Southeast and Central-West regions, while only three species have been recorded in the Northeast region. In this paper, we describe and illustrate two new species of *Notalina* (*Neonotalina*), *Notalina* (*Neonotalina*) *diamantina* sp. nov. and *Notalina* (*Neonotalina*) *daniae* sp. nov., from Chapada Diamantina National Park, Bahia, Northeast Brazil. We also provide new distributional records for other leptocerids from the Caatinga biome.

**Keywords.** Hudsonemini, taxonomy, South America, long-horned caddisflies.

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## Introduction

The long-horned caddisfly Leptoceridae Leach, 1815 is one of the largest three families of Trichoptera Kirby, 1813, with more than 2235 described species and 49 genera worldwide (Holzenthal & Calor 2017; Morse *et al.* 2019). Currently, the family is divided into four subfamilies: Grumichellinae

Morse, 1981 and Triplectidinae Ulmer, 1906, both occurring mainly in the Australian and Neotropical regions; Leptocerinae Ulmer, 1903 with a cosmopolitan distribution; and Leptorussinae Morse, 1981, which includes the single Australian-endemic genus *Leptorussa* Mosely, 1953 (in Mosely & Kimmins 1953) (Malm & Johanson 2011). In Brazil, Leptoceridae is represented by 103 species in ten genera: *Achoropsyche* Holzenthal, 1984, *Amazonatolica* Holzenthal & Pes, 2004, *Atanatolica* Mosely, 1936, *Grumichella* Müller, 1879, *Ibyacerina* Henriques-Oliveira, Silva, Nessimian & Takiya, 2021, *Nectopsyche* Müller, 1879, *Neoathripsodes* Holzenthal, 1989, *Notalina* Mosely, 1936, *Oecetis* McLachlan, 1877, and *Triplectides* Kolenati, 1859. Among these, *Achoropsyche*, *Amazonatolica*, and *Ibyacerina* are monotypic and endemic (Calor *et al.* 2024a).

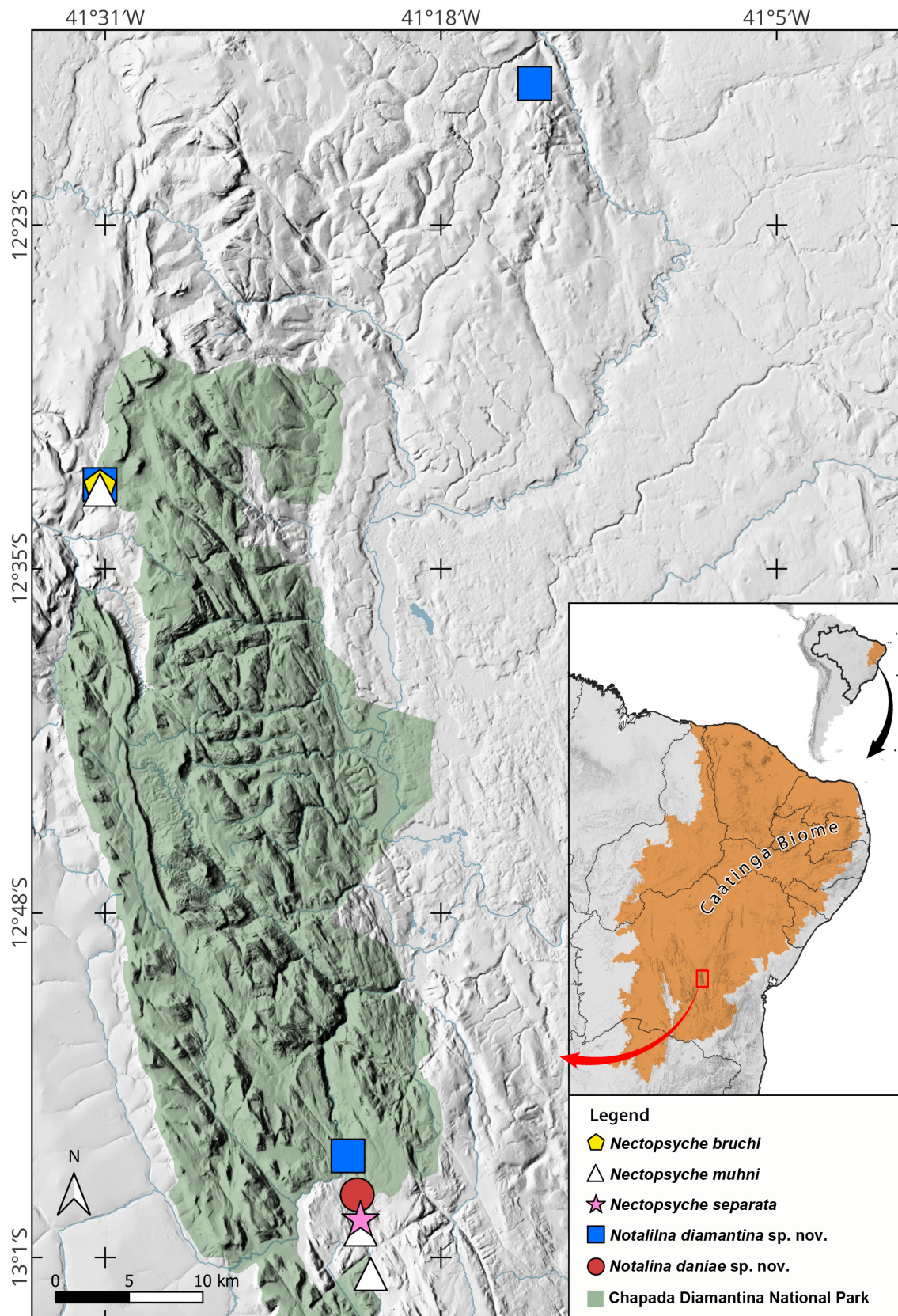
The genus *Notalina* belongs to the tribe Hudsonemini of the subfamily Triplectidinae and was established by Mosely (1936) for three Australian species: *Notalina parkeri* Mosely, 1936, *N. delicatula* (Ulmer, 1908), and *N. flava* (Ulmer, 1908). Since then, many species have been described. Currently, *Notalina* is divided into two subgenera: *Notalina* (*Notalina*) Mosely, 1936, with 15 endemic species from Australia and Tasmania, and *Notalina* (*Neonotalina*) Holzenthal, 1986 with 14 species exclusively from South America (Holzenthal & Calor 2017; Henriques-Oliveira *et al.* 2018; Silva-Pereira *et al.* 2022; Calor *et al.* 2024b). Holzenthal (1986) informally recognized two species groups in the Neotropical subgenus *Neonotalina*, based mainly on characters of the male genitalia: *N. roraima* species group, occurring in the upper Amazon basin, the Northern Andes, and the Guiana Highlands, represented by *Notalina* (*Neonotalina*) *mathiasi* Holzenthal, 1986, *N. (Neonotalina) nanay* Holzenthal, 1986, and *N. (Neonotalina) roraima* Holzenthal, 1986, and *N. brasiliiana* species group mainly occurring in the highlands of the Cerrado and Atlantic Forest biomes of the Southeast and Central areas of the country, which includes *Notalina* (*Neonotalina*) *brasiliiana* Holzenthal, 1986, *N. (Neonotalina) cipo* Holzenthal, 1986, *N. (Neonotalina) claudiofroehlich* Desidério & Calor, 2024 (in Calor *et al.* 2024b), *N. (Neonotalina) franciscana* Henriques-Oliveira, Rocha & Nessimian, 2018, *N. (Neonotalina) froehlich* Calor & Holzenthal, 2006 (in Calor *et al.* 2006), *N. (Neonotalina) goianensis* Calor, 2008, *N. (Neonotalina) hamiltoni* Holzenthal, 1986, *N. (Neonotalina) jordanensis* Henriques-Oliveira, Spies & Dumas, 2012, *N. (Neonotalina) morsei* Holzenthal, 1986, *N. (Neonotalina) paulista* Calor & Holzenthal, 2006 (in Calor *et al.* 2006), and *N. (Neonotalina) ralphi* Silva-Pereira, Oliveira, Desidério, Calor & Hamada, 2022 (Calor *et al.* 2024a).

The Caatinga biome extends over an area of approximately 800 000 km<sup>2</sup> in Northeastern Brazil, encompassing parts of nine Brazilian states: Alagoas, Bahia, Ceará, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe in the Northeast region, plus Minas Gerais in the Southeast region. According to Prado (2003), the Caatinga is a mosaic of different forest types, characterized by short trees and shrubs with xerophytic traits, influenced by climatic extremes when compared to other Brazilian formations: highest solar radiation, highest annual temperature means, lowest rates of relative humidity, and lowest precipitation, which is limited to a very short period of the year. Currently, three species of *Notalina* (*Neonotalina*) are recorded from the Northeast region: *N. brasiliiana*, *N. cipo*, and *N. claudiofroehlich* (Calor *et al.* 2024b). Here, we describe and illustrate two new species of *Notalina* (*Neonotalina*) from Chapada Diamantina National Park (PNCD) and its surroundings within the Caatinga biome. We also provide new records of other Leptoceridae from Northeast Brazil.

## Material and methods

### Study area

Specimens of caddisflies were collected from various streams in Chapada Diamantina National Park and its surroundings, Bahia, Brazil (Fig. 1). Chapada Diamantina National Park (PNCD), covering an area of 152 000 hectares, is located in the Serra do Sincorá, in the central region of Chapada Diamantina (plateau). It spans the municipalities of Lençóis, Mucugê, Ibicoara, Andaraí, and Palmeiras, in the state of Bahia (MMA 2007). Chapada Diamantina forms a large set of plateaus in the northern part of the Serra do Espinhaço, a mountain range that stretches from the states of Minas Gerais to Bahia. The Chapada Diamantina rises like an imposing wall, with average altitudes over 1000 meters, acting as a watershed divide between the rivers flowing into the São Francisco River basin and those heading directly to the



**Fig. 1.** Distribution map of the *Notalina* Mosely, 1936 and *Nectopsyche* Müller, 1879 species treated in this study.

Atlantic Ocean (IBGE 1977). The park boasts a significant ecological and environmental diversity, being part of both the Caatinga (RBCAAT) and Atlantic Forest (RBMA) Biosphere Reserves (MMA 2007).

### **Sampling and illustrations**

Adult specimens were collected using a collapsible light trap (Nessimian *et al.* 2024), a Malaise trap (Gressitt & Gressitt 1962), suspended over bodies of water, a white sheet, or by hand net. All specimens were preserved in 80–96% ethanol. To observe the genital structures, the abdomen was removed and cleared using 10% KOH or 85% lactic acid, as described by Blahnik *et al.* (2007). Abdomens were temporarily mounted on a cavity slide with glycerin for viewing and drawing and then transferred to a microvial with 80% ethanol for storage alongside the remainder of the specimen. The terminology for adults follows that of Holzenthal (1986) and Calor *et al.* (2006) for males, and Ito *et al.* (2013) for females.

Pencil sketches of wings and genital structures were made under a stereo microscope (Carl Zeiss, model Stemi SV6) and a compound microscope (Carl Zeiss, model Axiolab), both equipped with a camera lucida. The sketches were scanned and imported into an Adobe Illustrator (ver. 22.0.1, Adobe Systems, Inc.) document to create graphic vectors. Photographs were taken with a digital Leica Camera (DFC450) coupled to a Leica stereo microscope (M205C). A series of photographs of each structure at different focal planes were stacked using the Leica Application Suite (ver. 4.6.2). The map was created using QGIS ver. 3.34.4 (QGIS Development Team 2020).

The types and all other examined specimens are deposited at the Coleção Entomológica Professor José Alfredo Pinheiro Dutra, Departamento de Zoologia, Universidade Federal do Rio de Janeiro, Rio de Janeiro (DZRJ), and some paratypes of the new species housed in Museu Nacional, Universidade Federal do Rio de Janeiro, Rio de Janeiro (MNRJ).

### **Abbreviations of taxonomic structures**

alp	=	apicolateral process
apm. gon.	=	apicomeresal process of gonopod plate
bdp	=	basodorsal process
bvp	=	basoventral process
d	=	discoidal cell
dmp	=	dorsomesal process
inf. app.	=	inferior appendage
mdp	=	mesodorsal process
mvp	=	mesoventral process
pr. app.	=	preanal appendages
sp. scl.	=	spermathecal sclerite
th	=	thyridial cell
I, III, V	=	forks I, III or V
VIII	=	segment VIII
IX	=	segment IX
X	=	segment X

### **Institutional abbreviations**

DZRJ	=	Coleção Entomológica Prof. José Alfredo Pinheiro Dutra, Departamento de Zoologia, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil
MACN	=	Museo Argentino de Ciencias Naturales “Bernardino Rivadavia”, Buenos Aires, Argentina
MCZ	=	Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA
MNRJ	=	Museu Nacional, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil
MZBS	=	Museo de Zoologia, Barcelona, Spain

## Results

### Taxonomy

Class Insecta Linnaeus, 1758  
Order Trichoptera Kirby, 1813  
Suborder Integripalpia Martynov, 1924  
Superfamily Leptoceroidea Leach, 1815  
Family Leptoceridae Leach, 1815  
Subfamily Triplectidinae Ulmer, 1906  
Genus *Notalina* Mosely, 1936  
Subgenus *Neotalina* Holzenthal, 1986

*Notalina* (*Neotalina*) *diamantina* sp. nov.

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Figs 2–6

### Diagnosis

This new species can be identified by the following characteristics: segment X with a very long dorsomesal process, with a rounded apex and a tuft of very long setae, in lateral view, facing upwards at an angle  $>45^\circ$ ; the apicolateral processes short, truncate, and equipped with stout setae; and the mesodorsal process of the inferior appendages digitate, long, and flat (like a blade), bearing a single seta on the apical third.

The new species is assigned to the *N. brasiliiana* species group as defined by Holzenthal (1986) based on the presence of acuminate flanges on the phallobase and the well-developed phallosclerite. *Notalina* (*Neotalina*) *diamantina* sp. nov. resembles *N. brasiliiana*, *N. froehlichii*, and *N. goianensis*, due to the presence of long, setose apicodorsal processes of segment X. However, it differs from its relatives in the appearance of segment X in the dorsal view: in the new species, the apicodorsal processes are well developed, rounded, and enlarged apically with long setae. Furthermore, they are very long and well upturned dorsally with an inclination angle of almost  $90^\circ$ . In contrast, *N. brasiliiana* and *N. goianensis* have apicomeres that are long, thin, and have an inclination angle of  $45^\circ$  or less. Although *N. froehlichii*, in lateral view, shows apicomeres with the same angle of inclination as the new species, the apicolateral processes are digitate and rounded, while in *N. diamantina*, they are short and truncate. Another difference is that segment X in *N. froehlichii* is elevated in the middle length in lateral view, whereas in the new species, it is only slightly elevated near the base. The mesoventral process of the inferior appendages in the new species is subtriangular, similar to *N. brasiliiana* and *N. goianensis*, while in *N. froehlichii*, it is long and slender with a narrower apex.

### Etymology

Species named in reference of the type locality Chapada Diamantina National Park (or Parque Nacional da Chapada Diamantina – PNCD, in Portuguese), where the individuals of the new species were collected. It is a noun in apposition.

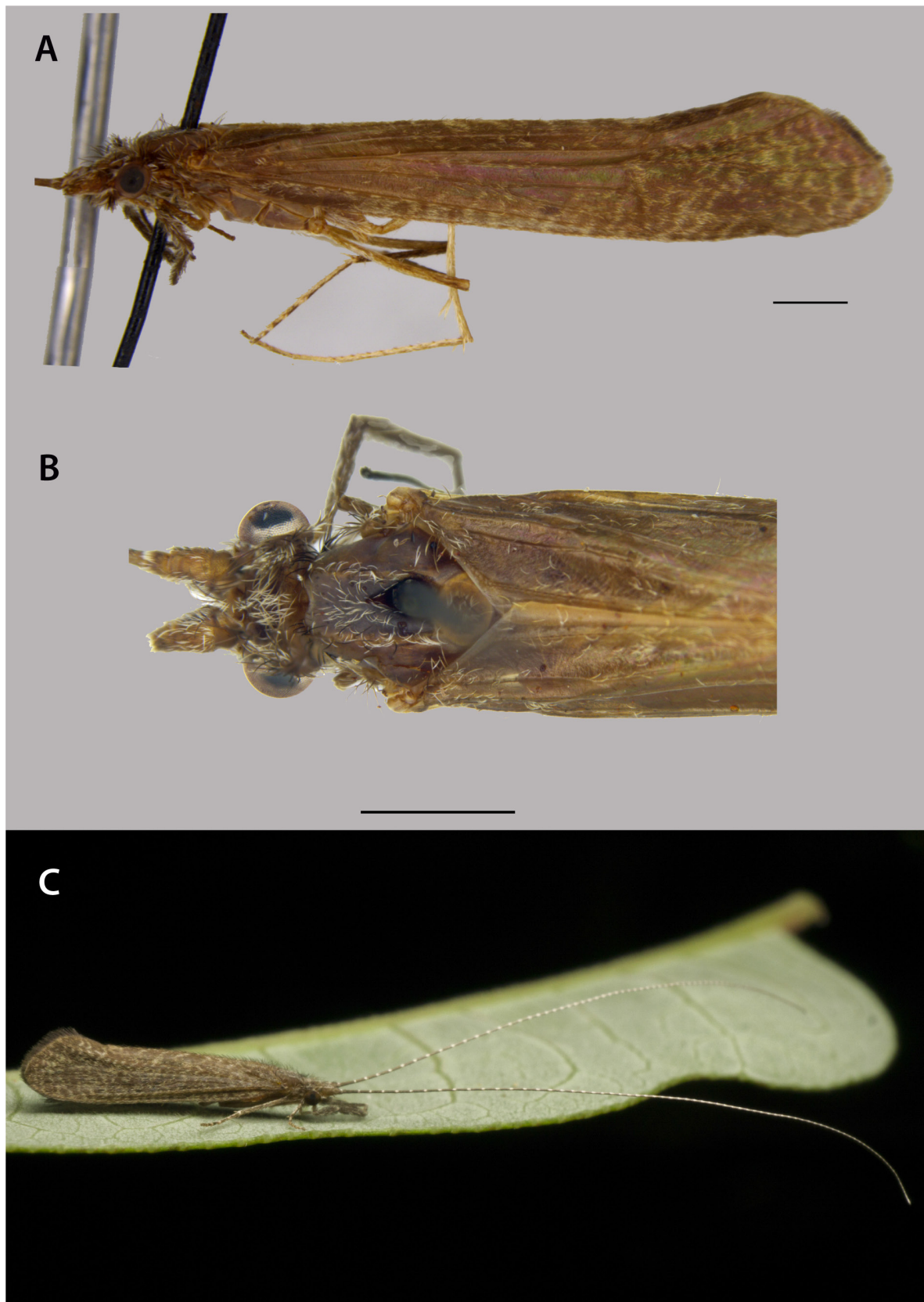
### Type material

#### Holotype

BRAZIL – Bahia • ♂; Palmeiras, Parque Nacional da Chapada Diamantina, near to Cachoeira Conceição dos Gatos;  $12^\circ32'19''$  S,  $41^\circ30'47.8''$  W; alt. 775 m; 12 May 2021; A.A. Alves leg.; white sheet; [alcohol]; DZRJ TRICHOPTERA9720.

#### Paratypes

BRAZIL – Bahia • 3 ♂♂; same data as for holotype; DZRJ TRICHOPTERA9721 • 2 ♂♂, 1 ♀; same data as for holotype; [alcohol]; MNRJ-ENT10–268 • 1 ♂; same data as for holotype; [pinned]; MNRJ-ENT10–269 • 1 ♂; Mucugê, Parque Nacional da Chapada Diamantina, Comunidade do Baixão, Rio



**Fig. 2.** *Notalina* (*Neonotalina*) *diamantina* sp. nov. (paratype, DZRJ TRICHOPTERA9725). **A.** Habitus, lateral view. **B.** Head and thorax, dorsal view. **C.** Living specimen. Scale bars = 1 mm.

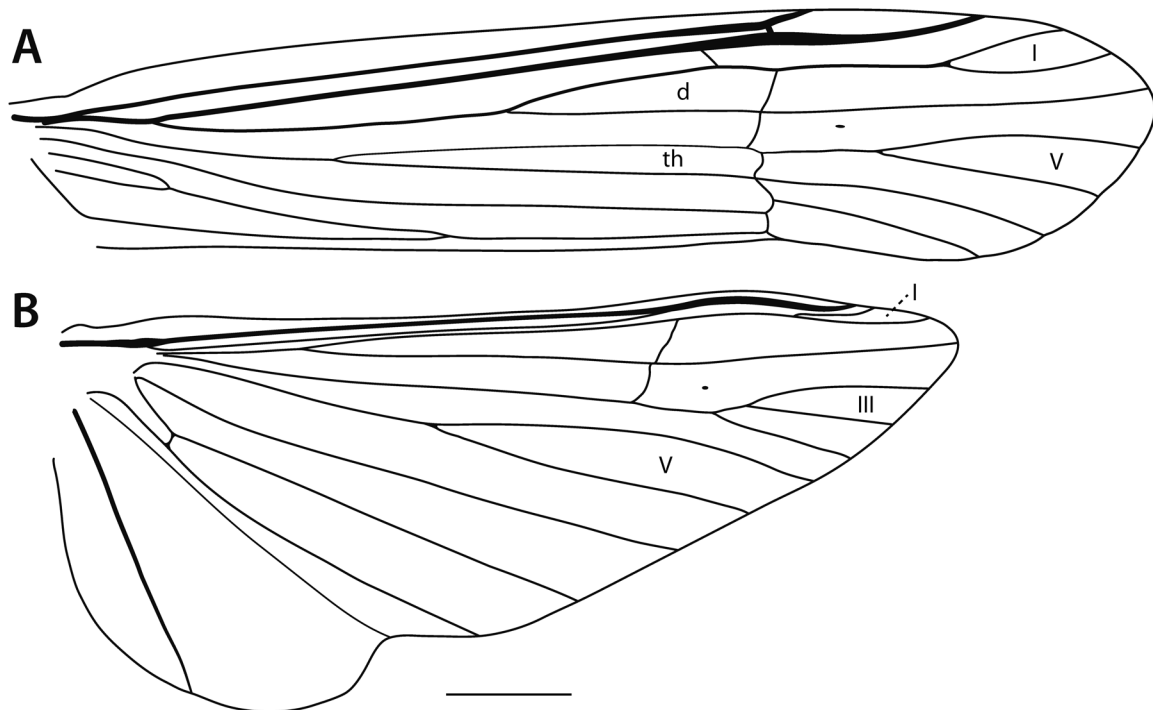
Uma; 12°17'36.2" S, 41°14'28.2" W; alt. 741 m; 23 Jul. 2018; J.S. Prando leg.; sweep; [alcohol]; DZRJ TRICHOPTERA9722 • 1 ♂, 2 ♀♀; Mucugê, Chapada Diamantina, Rio Cumbucas, Mar de Espanha; 12°56'52.8" S, 41°21'31.1" W; alt. 858 m; 11 Mar. 2012; D.M. Takiya and A.P.M. Santos leg.; [alcohol]; DZRJ TRICHOPTERA9723 • 1 ♂; same data as for preceding; [pinned]; DZRJ TRICHOPTERA9725 • 1 ♂; same data as for preceding; DZRJ TRICHOPTERA9726 • 1 ♀; same data as for preceding; DZRJ TRICHOPTERA9727.

## Description

### Adult male (Figs 2–4)

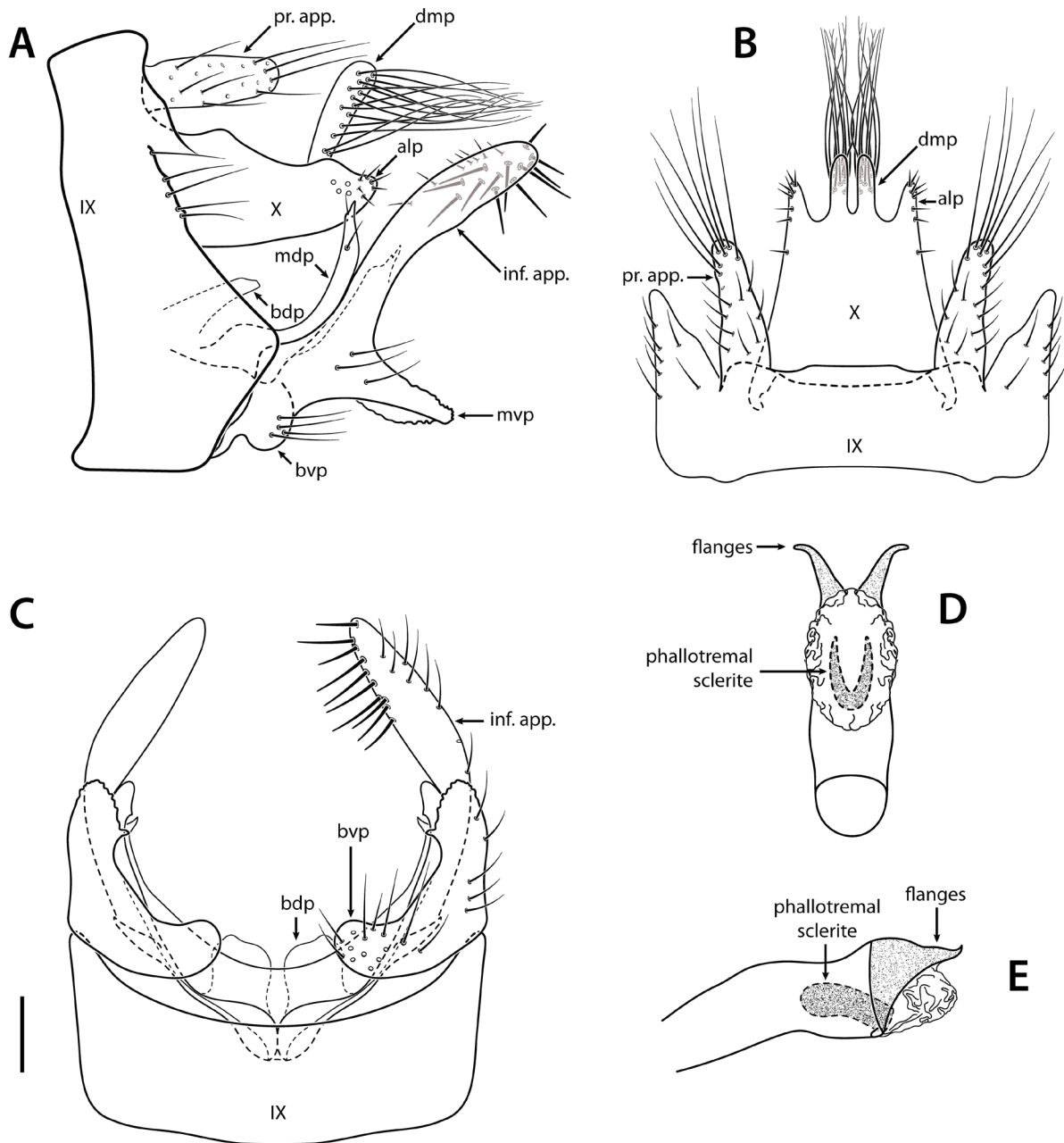
COLOUR (pinned). Body and wings golden brown with off-white spots (Fig. 2). Legs, palps, and antennae golden brown (Fig. 2). Tibial spur formula 2, 2, 4. Forewing with forks I and V present (Fig. 3A); hindwing with forks I, III, and V present (Fig. 3B). Length of forewing = 8.0–9.5 mm. Length of hindwing = 6.0–7.0 mm (n = 11).

MALE GENITALIA (Fig. 4). Abdominal segment IX annular, in lateral view, broadest ventrolaterally, with setae on posterolateral edge, anterior margin slightly produced on median third (Fig. 4A). Preanal appendages digitate, slightly truncate, with long setae at apex, approximately  $\frac{1}{2}$  the length of segment X (Fig. 4B). Segment X, in lateral view, is slightly elevated at the base with a concave mesally, bearing two apical processes: a very long, digitate dorsomesal process with a rounded apex and a tuft of very long setae, facing upward dorsally (with an angle  $>45^\circ$ , sometimes almost  $90^\circ$ ); and a short, truncate apicolateral process with small stout setae at the apex (Fig. 4A). In dorsal view, segment X is broad at the base, with the posterior margin bearing two processes: a pointed lateral process with stout setae and a median process that is digitate and enlarged at the apex, very upturned, bearing a tuft of very long



**Fig. 3.** *Notalina* (*Neonotalina*) *diamantina* sp. nov., wing venation (holotype, DZRJ TRICHOPTERA9720). A. Forewing. B. Hind wings. Abbreviations: see Material and methods. Scale bar = 1 mm.

setae (Fig. 4B). The inferior appendage, in ventral view, is broad at the base with an elongate, digitate, and setose apical portion; the basoventral protuberance is short, rounded, and very setose when viewed laterally, and enlarged ventrally (Fig. 4C). The mesoventral process is elongate, with approximately half the length of the apical portion, rounded at the apex (Fig. 4C). In lateral view, it is subtriangular with a median carina, setose on the posterior margin, and has an acuminate apex. The mesodorsal process is long and digitate, flat (like a blade), bearing a long seta on the apical third, postero-dorsally directed with an acute apex when viewed laterally (Fig. 4A). The basodorsal process, in ventral view, is rounded and slightly higher than the basoventral protuberance (Fig. 4C). The phallic apparatus features a well-



**Fig. 4.** *Notalina (Neonotalina) diamantina* sp. nov., male genitalia (holotype, DZRJ TRICHOPTERA9720). **A.** Lateral view. **B.** Dorsal view. **C.** Ventral view. **D.** Phallic apparatus, ventral view. **E.** Phallic apparatus, lateral view. Abbreviations: see Material and methods. Scale bar = 0.1 mm.

developed phallobase with a pair of laterally directed acuminate flanges (Fig. 4D–E); the phallotremal sclerite is well developed, roughly U-shaped in ventral view (Fig. 4D), and oval and downcurved in lateral view (Fig. 4E).

**Adult female** (Figs 5–6)

**COLOUR.** Body golden brown (in alcohol), with some whitish setae on wings (Fig. 5): Tibial spur formula 2, 2, 4. Forewing with forks I and V present; hindwing with forks I, III, and V present (Fig. 5). Length of forewing = 7.0 mm. Length of hindwing = 5.5 mm (n = 4).

**FEMALE GENITALIA** (Fig. 6). Abdominal segment VIII, in ventral view, has a narrow sclerotized and setose plate, concave medially, presenting a rounded and rugose plate above (Fig. 6A–B). Segment IX sclerotized, annular, in dorsal view, almost straight, in lateral view, mesal portion produced and very setose (Fig. 6A), in ventral view, subquadrate, smooth, and slightly concave medially (Fig. 6B). Segment X forms a dorsal shelf, with a posterior margin slightly curved and bearing some stout setae, in lateral view, the posterior margin truncates (Fig. 6A–B). Preanal appendages short and subtruncate in dorsal



**Fig. 5.** *Notalina* (*Neonotalina*) *diamantina* sp. nov., female habitus (paratype, DZRJ TRICHOPTERA9723). **A.** Lateral view. **B.** Head and thorax, dorsal view. Scale bars = 1 mm.

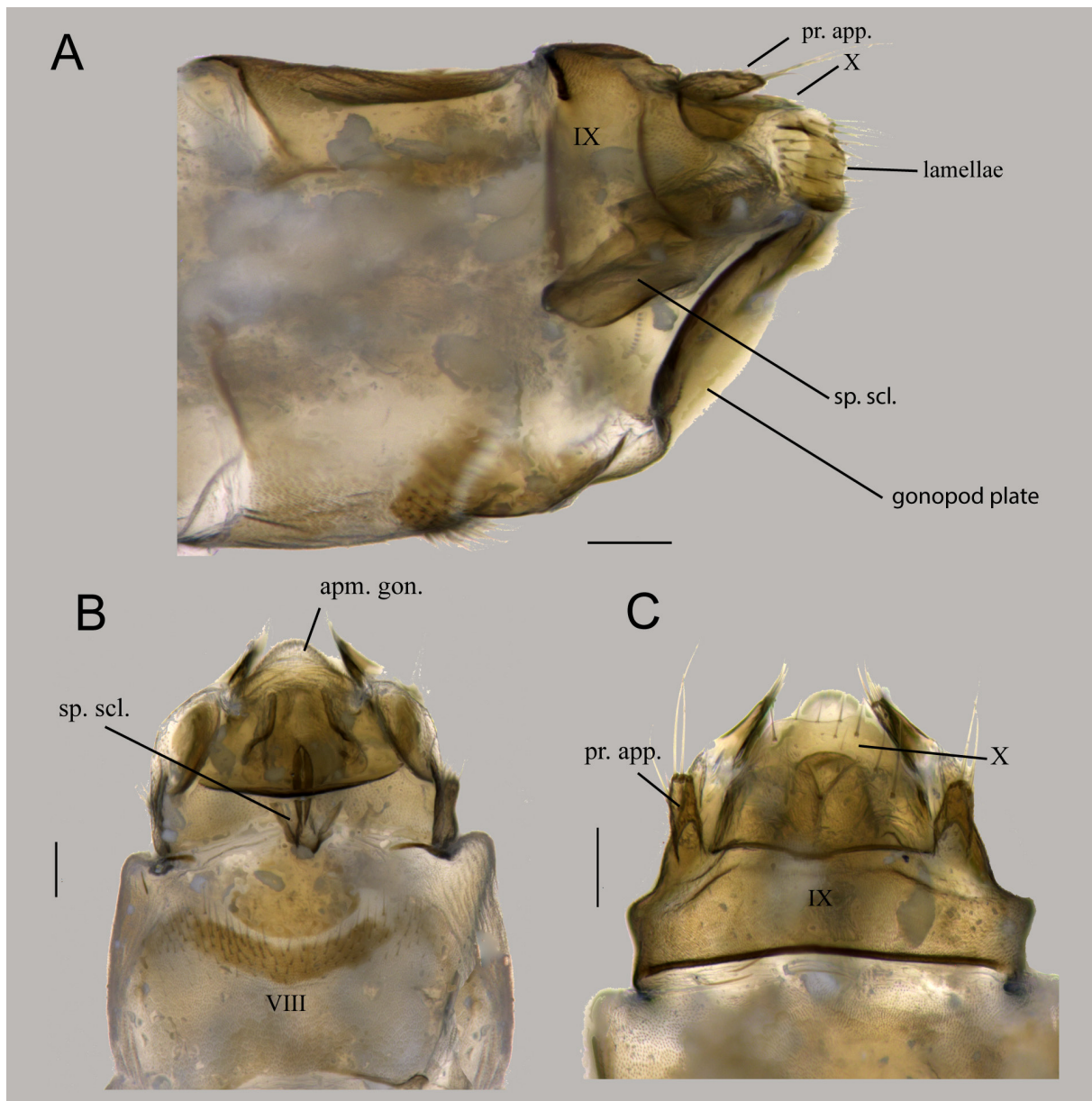
view, oval and rounded with apex bearing long setae in lateral view (Fig. 6). Lamellae broad, in lateral view subquadrate, setose, with a posterior margin slightly concave (Fig. 6A). Gonopod plate broad, subtriangular, and sclerotized. Apicomesal process of gonopod plate rounded with small setae (Fig. 6B); Spermathecal sclerite in amphora-shape with central elongate, keyhole-shaped sclerites (Fig. 6B).

#### Immature stages

Unknown.

#### Distribution (Fig. 1)

Brazil (Bahia state).



**Fig. 6.** *Notalina (Neonotalina) diamantina* sp. nov., female genitalia (paratype, DZRJTRICHOPTERA9723). **A.** Lateral view. **B.** Ventral view. **C.** Dorsal view. Abbreviations: see Material and methods. Scale bars = 0.1 mm.

*Notalina (Neonotalina) daniae* sp. nov.

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Figs 7–8

**Diagnosis**

*Notalina (Neonotalina) daniae* sp. nov. is identifiable by the distinctive structure of segment X, which features a V-shaped apicomeresal incision creating two large, rounded lobes. Additionally, in dorsal view, there are two small protuberances laterally at the mid-length of segment X with two setae in each one. The mesoventral processes of the inferior appendages are sub-quadrated with a pointed projection near the apex, while the mesodorsal processes are long, thin, and flat.

*Notalina (Neonotalina) daniae* sp. nov. is assigned to the *N. brasiliiana* species group as defined by Holzenthal (1986). The new species shares with *Notalina cipo*, *N. claudiofroehlichii*, *N. morsei*, and *N. ralphi* the shape of segment X with apicomeresal incision forming two large lobes and the absence of an apicomeresal process. However, *N. cipo* and *N. morsei* have a wider apicomeresal incision of segment X and V-shaped with long lobes and straight apices, while in the new species the apicomeresal incision is shorter than  $\frac{1}{3}$  of tergum X. *Notalina daniae* can be confused with *N. ralphi* and *N. claudiofroehlichii* by showing a similar pattern in the apicolateral processes of segment X that forms two rounded and setose lobes, but in *N. claudiofroehlichii* these lobes are strongly sclerotized apically and the apicomeresal incision of segment X is U-shaped, extending anteriorly ca  $\frac{1}{2}$  of its length, while segment X of the new species is membranous. Although *Notalina ralphi* possesses the V-shaped incision extending anteriorly ca  $\frac{1}{3}$  length of the segment like in *N. daniae*, it differs from *N. daniae* by the absence of lateral protuberances in segment X, and by having a row of 5–7 short, stout setae situated subapically, while *N. daniae* has two small protuberances at the middle-length of segment X in dorsal view. Another difference is observed in the mesoventral process of the inferior appendages in lateral view, where in the new species

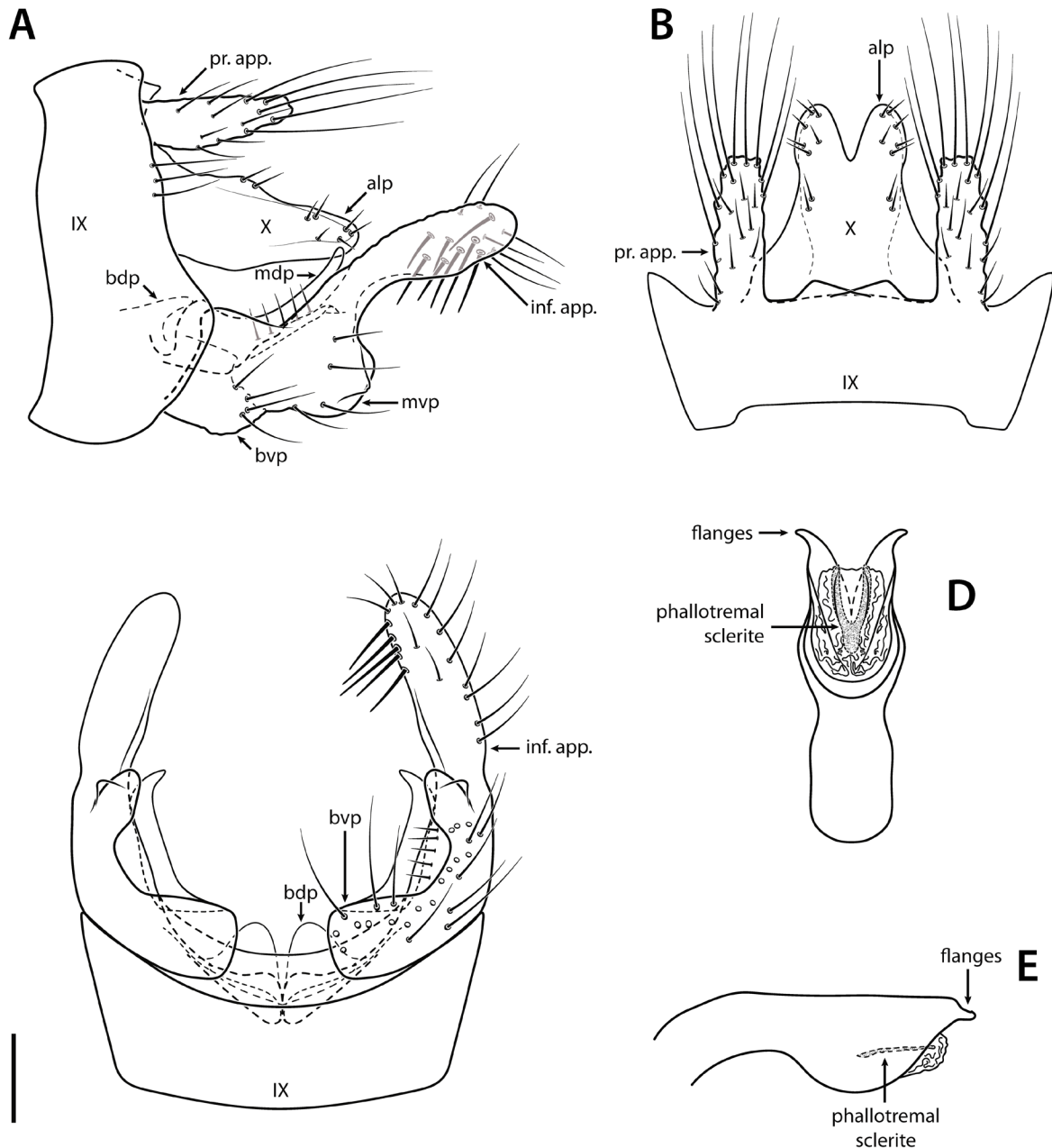


**Fig. 7.** *Notalina (Neonotalina) daniae* sp. nov. (holotype, DZRJ TRICHOPTERA9724). A. Habitus, lateral view. Scale bar = 1 mm.

*N. daniae* the inferior appendage is subquadrate with a small projection near the apex and in *N. ralphi* and *N. claudiofroehlichii* the inferior appendage is indistinct or rounded.

### Etymology

The species epithet ‘*daniae*’ is a noun in the genitive case to honor Prof. Dra Daniela ‘Dani’ Takiya, who collected the new species.



**Fig. 8.** *Notalina (Neonotalina) daniae* sp. nov., male genitalia (holotype, DZRJ TRICHOPTERA9724). **A.** Lateral view. **B.** Dorsal view. **C.** Ventral view. **D.** Phallic apparatus, ventral view. **E.** Phallic apparatus, lateral view. Abbreviations: see Material and methods. Scale bars = 0.1 mm.

## Type material

### Holotype

BRAZIL – Bahia • ♂; Mucugê, Iगतú, Parque Nacional da Chapada Diamantina, Córrego das Perdizes com Rio Cumbucas; 12°58'29.8" S, 41°21'7.9" W; alt. 889 m; 10 Mar. 2012; A.P.M. Santos and D.M. Takiya leg.; white sheet; [pinned]; DZRJ TRICHOPTERA9724.

## Description

### Adult male (Figs 7–8)

COLOUR (pinned). Head and thorax brown with off-white spots. Legs, palps, and antennae golden brown (Fig. 7A). Tibial spur formula 2, 2, 4. Length of forewing: 7.00 mm (n = 1).

MALE GENITALIA (Fig. 8). Abdominal segment IX annular, in lateral view, broadest laterally, posterolateral margin with some setae above preanal appendages, posterior margin slightly produced medially (Fig. 8A); in dorsal view, sub-rectangular with posterior margin irregular and protruded laterally; anterior margin almost straight (Fig. 8B). Preanal appendages digitate, longer than half the length of segment X, rounded apically with long setae (Fig. 8A–B). Segment X, in lateral view, almost straight, featuring a small protuberance medially with two setae, and having a rounded apex with sparse stout setae; in dorsal view, broad at the base with two small membranous protuberances laterally at the middle-length of segment X and a V-shaped incision at the apex, dividing it into two rounded lobes (Fig. 8A). Inferior appendages, in ventral view, broad at base with apical portion elongate, digitate and setose; basodorsal process rounded and well developed, basoventral protuberance robust, rounded, and very setose (Fig. 8C); mesoventral process with approximately half-length of apical portion, rounded, protrude with a small point near apex; in lateral view, very large, subquadrate, setose on the posterior margin, with a pointed protuberance near the apex; mesodorsal process digitate long, thin, flat, like a blade with acute apex inward directed (Fig. 8A). Phallic apparatus with phallobase well developed and a pair of laterally directed acuminate flanges (Fig. 8D); phallosclerite well developed, roughly Y-shaped, in ventral view (Fig. 8D).

### Female and immature stages

Unknown.

### Distribution (Fig. 1)

Brazil (Bahia state).

### *New records of other Leptoceridae species from Chapada Diamantina, Bahia*

Family Leptoceridae Leach, 1815  
Subfamily Leptocerinae Ulmer, 1903  
Genus *Nectopsyche* Müller, 1879

*Nectopsyche bruchi* (Navás, 1920)

Fig. 1

*Leptocella bruchi* Navás, 1920: 66 (Type locality: Argentina, Monte Veloz, Estancia Barreto; MACN, ♂ reported).

*Nectopsyche bruchi* – Holzenthal & Calor 2017: 322 (catalogue). — Calor *et al.* 2024b (distribution).

### Material examined

BRAZIL – Bahia • 10 ♂♂, 2 ♀♀; Palmeiras, PARNA Chapada Diamantina, near to Cachoeira Conceição dos Gatos; 12°32'19" S, 41°30'47.8" W; alt. 775 m; 12 May 2021; A.A. Alves leg.; white sheet; [alcohol and pinned]; DZRJ.

### Remarks

In Brazil, this species has a more southeastern distribution recorded in Minas Gerais, Paraná, and Rio de Janeiro states, occurring in areas of the Atlantic Forest and Cerrado biome (Calor *et al.* 2024a). Herein, it is recorded for the first time the state of Bahia, and the Caatinga biome.

### Distribution

Argentina, Brazil (states: Bahia (**new record**), Minas Gerais, Paraná and Rio de Janeiro), and Paraguay.

### *Nectopsyche muhni* (Navás 1916)

Fig. 1

*Leptocella muhni* Navás, 1916: 68 (Type locality: Argentina, Santa Fé, MZBS, ♀ reported).

*Nectopsyche muhni* – Holzenthal & Calor 2017: 326 (catalogue). — Calor *et al.* 2024b (distribution).

### Material examined

BRAZIL – Bahia • 1 ♂; Mucugê, PARNA Chapada Diamantina, Cachoeira das Andorinhas; 13°1'2.6" S, 41°20'38.7" W; alt. 961 m; 21–24 Aug. 2018; J.M.S. Rodrigues, J.S. Prando, F.F.F. Moreira, C.C. Gonçalves and R. Carrenho leg.; Malaise trap; DZRJ • 4 ♂♂; Mucugê, PARNA Chapada Diamantina, road BA-242 near to bridge Dr. Heitor M. Chamusca; 12°59'24" S, 41°21'1.2" W; 20 Aug. 2018; C.C. Gonçalves leg.; white sheet; DZRJ • 1 ♂; Palmeiras, PARNA Chapada Diamantina, near to Cachoeira Conceição dos Gatos; 12°32'19" S, 41°30'47.8" W; alt. 775 m; 12 May 2021; A.A. Alves leg.; white sheet; DZRJ.

### Distribution

Argentina, Bolivia, Brazil (states: Bahia (**new record**), Espírito Santo, Maranhão, Minas Gerais, Pará, Piauí, Roraima, Rio de Janeiro and São Paulo), Ecuador, Guyana, Paraguay, Peru, Suriname, and Venezuela.

### *Nectopsyche separata* (Banks, 1920)

Fig. 1

*Leptocella separata* Banks, 1920: 353 (Type locality: Brazil, Santa Catarina, MCZ, ♂ reported).

*Nectopsyche separata* – Holzenthal & Calor 2017: 328 (catalogue). — Calor *et al.* 2024b. (distribution).

### Material examined

BRAZIL – Bahia • 1 ♂; Mucugê, PARNA Chapada Diamantina, road BA-242 near to bridge Dr Heitor M. Chamusca; 12°59'24" S, 41°21'1.2" W; 20 Aug. 2018; C.C. Gonçalves leg.; white sheet; DZRJ.

### Remarks

*Nectopsyche separata* was described from Santa Catarina State, and has a south-southeast distribution pattern in the country, being observed occurring in both the Cerrado and Atlantic Forest biomes (Calor *et al.* 2024a). This is the first northernmost record of the species, and the first for the state of Bahia and the Caatinga biome.

### Distribution

Argentina, Brazil (States: Bahia (**new record**), Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo, Paraná, and Santa Catarina), and Paraguay.

## Discussion

The Caatinga is a fragile biome, significantly affected by human activities. It is estimated that more than 28% of the original vegetation of the Caatinga has been altered by human activities, such as slash and burn, agriculture, firewood harvesting, hunting, and grazing (Castelletti *et al.* 2003). Currently, less than 2% of its natural vegetation is surrounded by protected areas. Despite its low diversity and low number of endemic species, recent studies indicate it is an important component of Brazilian biodiversity (Leal *et al.* 2005).

The Caatinga, located between the Atlantic Forest and the Cerrado biomes, shares many biotic components with these domains. Current assessments of Caatinga biodiversity with regard to aquatic insects, mainly caddisflies, are certainly underestimated; despite the increase in recent years, few biological inventories have been concentrated in this region (e.g., Costa *et al.* 2014; Quinteiro *et al.* 2014; Takiya *et al.* 2016; Rafael *et al.* 2017; Calor *et al.* 2024b). Calor *et al.* (2024b) provided the latest inventory of caddisflies in the northeast region, where 138 species were recorded for Bahia. Here, although the collections were conducted at only a few sites in PNCD, we observed the existence of two new species of *Notalina*, as well as records of three species of *Nectopsyche*: *N. bruchi*, *N. munhi*, and *N. separata*.

This study contributes to the understanding of aquatic insect diversity, specifically caddisflies, in the region. The documentation of two new *Notalina* species (*Notalina* (*Neonotalina*) *diamantina* sp. nov. and *Notalina* (*Neonotalina*) *daniae* sp. nov.) and the records of the three additional *Nectopsyche* species from Chapada Diamantina highlights the importance of biodiversity assessments for conservation efforts in this unique biome.

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