

## Two new species of *Simothraulopsis* Traver, 1947 (Ephemeroptera: Leptophlebiidae: Atalophlebiinae) from northeastern Brazil

Rodolfo Mariano\*

Universidade de São Paulo, Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto, Departamento de Biologia, Laboratório de Entomologia Aquática, Monte Alegre, Ribeirão Preto, SP, Brazil

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The genus *Simothraulopsis* contains three described species, one of which occurs in Brazil. The new species *Simothraulopsis diamantinensis* sp. n. and *Simothraulopsis janae* sp. n. are figured and described from male imagines. The main discriminating character of these two new species from their congeners is the fused forceps socket. The material was collected in Bahia State in northeastern Brazil.

**Keywords:** Neotropical region; taxonomy; mayfly; Leptophlebiidae; *Simothraulopsis*

### Introduction

In 1947, Traver described *Thraululus demerara* based on male and female imagines from Guyana and one female from Surinam, but she commented that this species may not belong to *Thraululus*. The genus *Simothraulopsis* was erected by Demoulin (1966) for one species, *S. surinamensis*, based on six larvae from Surinam. Later Domínguez, Peters, Peters and Savage (1997) synonymised the type species. *Simothraulopsis* then compassed *S. demerara* based on type material of *Thraululus demerara*; larvae with associated subimagines and imagines of *S. surinamensis*; larvae with associated subimagines and imagines of *T. demerara* from French Guyana and collections from the Amazon Basin, the Guiana Shield region of Brazil, and Venezuela (Domínguez et al. 1997).

Kluge (2007) proposed a new classification for Leptophlebiidae with many new taxa including new subgenera. In his work he maintained the genus *Simothraulopsis* and divided it into two subgenera, *Simothraulopsis* and *Maculognathus*. The former is composed of *S. (Simothraulopsis) demerara* (Traver, 1947) and the latter of two new species, *S. (Maculognathus) plesius* Kluge, 2007 and *S. (M.) sabalo* Kluge, 2007.

During a field trip to the State of Bahia, northeastern region of Brazil, male imagines of two new species of *Simothraulopsis* were collected. The aim of the present paper is to present their description.

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\*Email: rodolfo@usp.br

## Materials and methods

The imagines were collected with light traps. The types are deposited in the following institutions: holotype in Museu de Zoologia, Universidade de São Paulo, São Paulo-SP, Brazil (MZUSP) and paratypes in Instituto Nacional de Pesquisas da Amazônia (INPA), Florida A&M University, Tallahassee, Florida, USA (FAMU), and Instituto-Fundación Miguel Lillo, Tucumán, Argentina (IFML).

## Taxonomy

### Genus *Simothraulopsis* Demoulin, 1966

*Thraululus* Traver, 1947; 1960.

*Simothraulopsis* Demoulin, 1966; Domínguez et al. 1997, 2006; Kluge 2007.

### Diagnosis

The diagnosis given by Traver (1947) can be emended as follows: (1) styliger plate of male imago with fused forceps sockets (forming a single cavity) or not fused; (2) penes fused basally, divided in apical 3/4 to 1/2 with a spine on apex of each penis lobe.

### *Simothraulopsis diamantinensis* sp. n. (Figures 1–5)

*Material examined.* Holotype. ♂ imago, Brasil: Bahia: Lençóis, Rio Ribeirão, Parque Nacional Chapada Diamantina, 23-x-2008, light trap, Calor, A.R.; Mariano, R & Mateus, S. (MZUSP). Paratypes: 2♂ imagines, same data as holotype (INPA); 2♂ imagines, same data as holotype (FAMU); 2♂ imagines, same data as holotype (IFML), and 2♂ imagines, Brasil: Bahia: Barreiras, Rio das Ondas, 15-x-2008, light trap, Calor, A.R.; Mariano, R & Mateus, S. (MZUSP); 2 ♂ imagines, same data (FAMU).

### Diagnosis

This species can be separated from all other congeners by combination of the following characters: (1) forceps sockets fused, forming a single cavity; (2) penes divided in apical 3/4; (3) spines of penes directed medially.

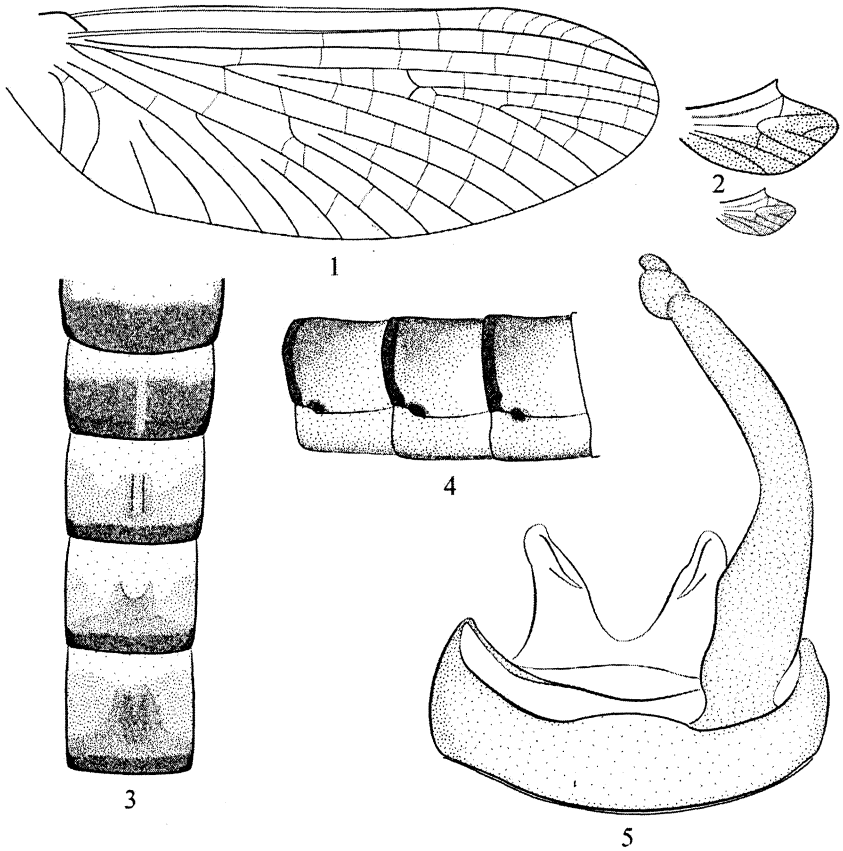
### Male imago (in alcohol and slide)

*Length.* Body 4.8–5.9 mm. General colouration brown–yellowish.

*Head.* Brown; eyes of male meeting on meson of head, upper portion of eyes brown–yellowish and lower portion black; ocelli white with a black ring at base; antenna pale with scape brown.

*Thorax.* Terga brown with sutures dark brown, sterna brown–yellowish with sutures brown.

*Wings* (Figures 1 and 2). Forewings hyaline; cross-vein yellowish; base of C and Sc brown yellowish; fork of vein MP slightly asymmetric. Hind wings with costal projection well developed, distal margin forming almost square angle; inferior portion tinged of black.



Figures 1-5. *Simothraulopsis diamantinensis* sp. n. (1) Forewing; (2) hind wing (top scale and enlarged); (3) colour pattern of abdominal segments II-VI, ventral view; (4) colour pattern of abdominal segments IV-VI, lateral view; (5) styliiger plate, ventral view.

*Legs.* Yellowish; femur brown-yellowish gradually yellow to apex; tibia and tarsomeres greyish.

*Abdomen* (Figures 3 and 4). Tergum I black; terga II-VI yellowish translucent with a posterior black spot and a strong posterior black band; terga VII-X brownish. Sternum I translucent; sterna II-VI translucent with posterior area yellow; sterna VII-X dark yellow-brownish.

*Genitalia* (Figure 5). Styliiger plate yellowish with forceps brownish; forceps sockets fused, forming a single cavity; penes fused basally divided in apical 3/4, apex rounded with a spine directed to the middle area. Terminal filament brownish on base, gradually paler to apex.

### *Larva*

Unknown.

**Etymology**

The species is named after the type locality, Parque Nacional Chapada Diamantina.

***Simothraulopsis janae* sp. n.** (Figures 6–11)

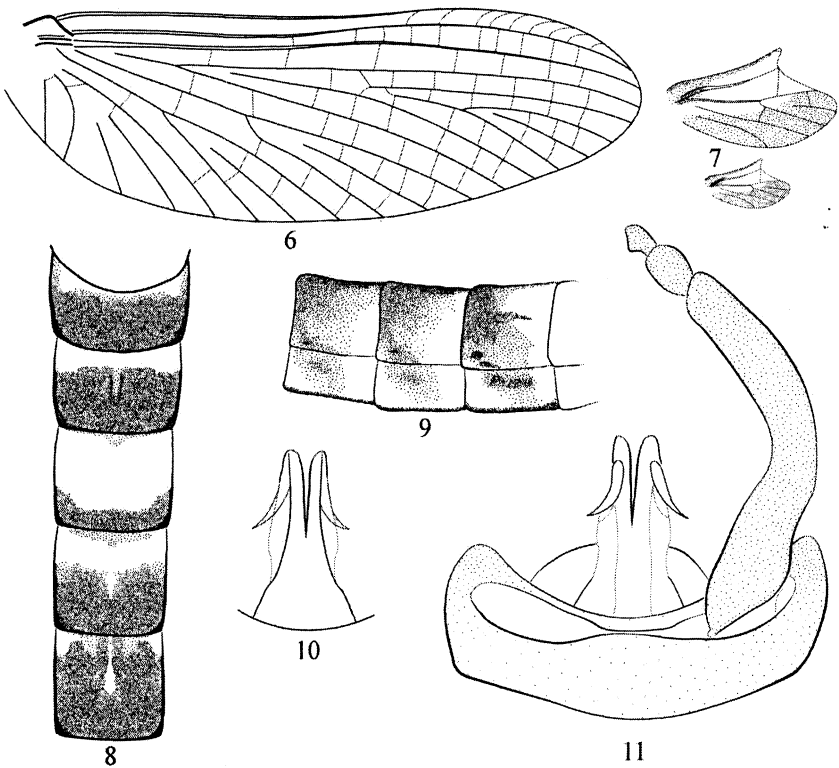
*Material examined.* Holotype. ♂ imago, Brasil: Bahia: Barreiras, Rio de Janeiro, Cachoeira Acaba Vida, 14-x-2008, light trap, Calor, A.R.; Mariano, R & Mateus, S. (MZUSP). Paratypes. 1♂ imago, same data as holotype (INPA); 2♂ imagines, same data as holotype (FAMU); 2♂ imagines, same data as holotype (IFML).

**Diagnosis**

This species can be separated from all other congeners by a combination of the following characters: (1) forceps sockets fused, forming a single cavity; (2) penes divided in apical 1/2; (3) shape of penes slim.

**Male imago (in alcohol and slide)**

*Length.* Body 4.2–4.5 mm; general colouration brown and translucent.



Figures 6–11. *Simothraulopsis janae* sp. n. (6) Forewing; (7) hind wing (to scale and enlarged); (8) colour pattern of abdominal segments II–VI, ventral view; (9) colour pattern of abdominal segments IV–VI, lateral view; (10) penes, dorsal view; (11) styliiger plate, ventral view.

**Head.** Brown; eyes of male meeting on meson of head, upper portion of eyes brown and lower portion black; ocelli white with a black ring at base; antenna pale with scape brown.

**Thorax.** Terga brown with sutures dark brown, sterna brown–yellowish with sutures brown.

**Wings** (Figures 6 and 7). Forewings hyaline; cross-vein yellowish; base of C and Sc brown yellowish; fork of vein MP symmetric. Hind wings with costal projection well developed, distal margin forming almost square angle; inferior portion and base of veins C and Sc black.

**Legs.** Brown yellowish; femora brown yellowish with apex yellow; tibiae from base to middle tinged black and from middle to apex white, tarsi white.

**Abdomen** (Figures 8 and 9). Tergum I black; terga II–III translucent at apex with a posterior black band; tergum IV translucent with a small black band; tergum V translucent at middle to apex and black at middle to base; terga VI–VII black with a translucent small band at apex; terga VIII–X black. Sterna I–X translucent with two black spots from tergum IV increasing to tergum X.

**Genitalia** (Figures 10 and 11). Styliiger plate brown–yellowish; forceps sockets fused, forming a single cavity; penes fused basally, divided in apical 1/2; dorsal portion of penes sclerotised, ventral portion membranous; slim shape; apex rounded with a curved spine directed to outer margin. Terminal filament broken and lost.

### **Larva**

Unknown.

### **Etymology**

This species is dedicated to Jan Peters, a wonderful person and important mayfly researcher who kindly helped me during my visit to FAMU, Tallahassee, FL.

### **Discussion**

The fused forceps socket has been a character used to identify *Thraulodes*, but now diagnosis of the genus *Simothraulopsis* is changed to accommodate the two new species. However, this is the main character of these two new species to separate them from all other species of *Simothraulopsis*. Another important difference between the species of *Simothraulopsis* is the shape of penes. In *S. demerara*, *S. janae*, *S. plesius*, and *S. sabalo*, the penes are divided in their apical half, while in *S. diamantinensis* three-quarters of the penes are divided apically. Unlike in all other species, the apical spines are directed to the middle of the styliiger plate in *S. diamantinensis*. The abdomen is generally translucent with black bands in the terga of *Simothraulopsis*, but in *S. diamantinensis* it is more yellowish than translucent. The brown posterior area in the hind wings is generally similar in all species, but the base of veins C and Sc in the two new species is clearer than in *S. demerara*.

In the classification proposed by Kluge (2007), the genus *Simothraulopsis* is composed of two subgenera. The two new species can be attributed to subgenus *Simothraulopsis* due to a characteristic colour pattern in the hind wings and abdomen that is also found in the type species. In both species described here, the fork of vein MP does not vary like that observed in *S. (M) plesius* and *S. (M) sabalo* (Kluge 2007).

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