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## New species for *Thraulodes* Ulmer, 1920 (Ephemeroptera: Leptophlebiidae: Atalophlebiinae) and the first key to adults from Brazil

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### Abstract

Four new species of the mayfly genus *Thraulodes* Ulmer are described based on imagos from Northeastern and Southern Brazil: *Thraulodes luizgonzagai* **sp. nov.**, *Thraulodes sternimaculatus* **sp. nov.**, *Thraulodes alapictus* **sp. nov.**, and *Thraulodes pinhoi* **sp. nov.** The new species can be easily differentiated by the abdominal color pattern and genitalia morphology. The first key to adults from Brazil is provided.

**Key words:** Aquatic insects, mayflies, taxonomy, neotropics

### Introduction

*Thraulodes* is one of the most abundant and the most widespread leptophlebiid genera (Ephemeroptera: Leptophlebiidae) in the Neotropics and its distribution extends from Central Argentina to Nearctic Region (Southern USA). Ulmer (1920) established *Thraulodes* from a male imago from Colombia originally described as *Thraulodes laetus* Eaton, 1883. Traver & Edmunds (1967) and Allen & Brusca (1978) revised the genus and proposed two species groups: the first based on adult genitalia characters and the second based on the gill structure of the nymphs.

Currently, there are 56 known species, with 35 species reported from South America and 22 from Central and North America (Barber-James *et al.* 2013). *Thraulodes marhieus* Dubey, 1970 was described from Northwest Himalaya, based on a female imago, however Hubbard & Peters (1978) and Kluge (2004) treat this species as *incertae sedis*. In Brazil 13 species are reported: *T. amanda* Mariano & Froehlich, 2011; *T. bonito* Gonçalves, Da-Silva & Nessimian, 2013; *T. cochunaensis* Domínguez, 1987; *T. daidaleus* Thew, 1960; *T. itatiajanus* Traver & Edmunds, 1967; *T. jones* Gonçalves, Da-Silva & Nessimian 2010; *T. limbatus* (Navás, 1936); *T. pelicanus* Mariano & Froehlich, 2011; *T. schlinger* Traver & Edmunds, 1967; *T. subfasciatus* Navás, 1924; *T. traver* Thew, 1960; *T. ulmeri* Edmunds, 1950; and *Thraulodes xavantinsensis* Mariano & Froehlich, 2011.

Nevertheless, the mayfly fauna from Brazil is still poorly known. Most species of *Thraulodes* in Brazil were registered from Southeastern and Southern regions, and the majority is known only based on its adult stage, which is a problem found in many groups of mayflies. The aim of this paper is to describe four new species of *Thraulodes* based on imagos and to elaborate the first key to adults from Brazil.

### Material and methods

The adults were caught on light traps right after sunset in three localities from Northeastern and Southern Brazil (Fig. 1). The material used in this study is preserved in alcohol 80%. Male legs and genitalia were dissected and then mounted in Euparal®, wings were dry mounted. In the following descriptions, terms referring to the adult thorax follow Kluge (1994) and terms referring to the genitalia follow Traver and Edmunds (1967). Drawings were