



Article

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Systematics and Phylogeny of *Ulmeritus-Ulmeritoides* revisited (Ephemeroptera: Leptophlebiidae)

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Abstract

Based on specimens recently collected from Brazil, two new species of *Ulmeritoides*, as well as the nymph and female imago of the atypical *U. flavopedes* are described. A new synonymy is proposed, *U. flavopedes* (= *U. oepa*). In order to re-evaluate the relationships of the species of the *Ulmeritus-Ulmeritoides* group based on these new evidences, a cladistic analysis is carried out. The monophyly of *Ulmeritus* and *Ulmeritoides* is reconfirmed, and a clear differentiation between the Central and South American species of *Ulmeritoides* emerges from the analysis.

Key words: Mayfly, Neotropics, new species, identification key, cladistics

Introduction

The genus *Ulmeritus* was erected by Traver (1956), and then the same author established three new subgenera (Traver 1959). Domínguez (1991) reviewed the status of the genus. In this paper, he elevated the subgenus *Ulmeritoides* Traver, 1959 to generic status, and transferred *U. flavopedes* (Spieth 1943), the only species in the subgenus *Pseudulmeritus* Traver, 1959 to *Ulmeritoides*. Domínguez (1995) carried out a cladistic analysis of the *Ulmeritus-Ulmeritoides* group, and described several new species. The data matrix was composed of 12 species: two out-groups (*Meridialaris* and *Atopophlebia*), three *Ulmeritus* and seven *Ulmeritoides*. Of the 10 species of *Ulmeritus-Ulmeritoides* treated, in only 5 the nymphal stage was included. As a result of the analysis, the monophyly of the genera *Ulmeritus* and *Ulmeritoides* was reconfirmed, as well as the position of *U. flavopedes* within *Ulmeritoides*.

Since Domínguez (1995), several new species were described and the nymphal stages of others became known (e.g. Lopes *et al.* 2003, Ávila & Flowers 2005, Mariano & Froehlich 2007). Besides that, recently collected material from Brazil resulted in the discovery of two new species and the unknown nymph of the atypical species *U. flavopedes*. For this reason, in addition to the descriptions of the new species and stages, we considered it necessary to carry out a new cladistic analysis, incorporating the new evidence in the matrix to see if the relationships proposed in the 1995 paper remained.

Material and methods

Material from the following institutions was studied: Instituto-Fundación Miguel Lillo, Tucumán, Argentina (IFML); Instituto Nacional de Pesquisas da Amazônia, Manaus, Brazil (INPA); Coleção Zoológica Norte Capixaba, Universidade Federal do Espírito Santo, São Mateus, Brazil (CZNC); Universidad del Valle, Cali, Colombia (UVC); Universidad de la República, Montevideo, Uruguay (URU); Instituto Nacional de Biodiversidad, Costa Rica (INBio); Florida Agricultural and Mechanical University, Tallahassee, Florida, USA