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A new species of sponge-dwelling *Oukuriella* (Chironomidae) from Brazil

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Abstract

Oukuriella Epler, 1986 is an exclusively Neotropical genus that comprises two well supported clades: inhabitants of freshwater sponges and inhabitants of immersed wood (saproxylophilic). In this work, males of a new chironomid species, *Oukuriella froehlichii* sp. n., are described and illustrated. Specimens were collected near stream in the Brazilian Atlantic Forest. Phylogenetic analyses performed in this study show that the newly discovered species belongs in the clade of freshwater sponge inhabitants.

Key words: Neotropics, Brazil, Chironomidae, freshwater sponges

Introduction

The genus *Oukuriella*, exclusively found in the Neotropical region, was originally erected by Epler (1986) based on the morphology of *O. albistyla*, *O. fasciata* and *O. simulatrix*. This group is characterized by the absence of the anal point and bifid superior volsella. Several new species of *Oukuriella* were subsequently described by Epler (1996), Messias & Fittkau (1997), Messias (1998, 2000), Messias & Oliveira (1998), Messias *et al.* (2000), Trivinho-Strixino & Messias (2005) and Fusari *et al.* (2008; 2009). *Oukuriella* was recently reviewed by Fusari *et al.* (2013) and six new species were added to genus. So, *Oukuriella* comprises 21 valid species, but the immature stages are known from only five species: *O. epleri* Messias *et* Fittkau, 1997, *O. intermedia* Messias, Fittkau *et* Oliveira 2000, *O. pesae* Fusari, Roque *et* Hamada, 2009, *O. pinhoi* Fusari, Roque *et* Hamada, 2013 and *O. jatai* Trivinho-Strixino *et* Messias, 2005.

The phylogeny of the genus was recently inferred based on the morphology of adult males (Fusari *et al.* 2013). Topologies obtained in this study indicated that the chironomids found on freshwater sponges and immersed wood constitute two major sister clades within *Oukuriella*, in addition there are other basal branches with unpredicted habitat. The evidence of a correlation between evolutionary relationships and life histories allows to infer the habitat of a larva basing on the placement of a species in the phylogenetic tree.

Material and methods

Examined material. Chironomids were collected in ethanol 70%, and deposited in the Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil (MZUSP). Specimens were slide-mounted using Euparal, following the procedures outlined by Sæther (1969). The terminology follows Sæther (1980). Measurements were made according to the method suggested by Sæther (1968) and Schlee (1966).

The measurements are given with the observed range, followed by the mean when more than five specimens are measured.

Phylogenetic analysis. Phylogenetic analysis was carried out include *Oukuriella froehlichii* sp. n. in the phylogenetic tree. The data matrix was evaluated under the maximum parsimony criterion using the TNT software

Discussion

Relationships between chironomids and their specific microhabitats (e.g. submerged wood and animals) are thought to represent major driving forces in the evolution of the family (Cranston & McKie 2006). Furthermore, interspecific interactions such as commensalism, parasitism and mutualism play an important role in the co-evolutionary history of chironomids with several aquatic organisms (fish, insects, and mollusks) (Tokeshi 1993; Roque *et al.* 2004).

In Fusari *et al.* (2013), the topologies yielded strong support to the sponge-dwelling group based on adult male morphology. Our results also show two well supported clades that correspond to the distribution of the species habitats as immatures. So in *Oukuriella*, the phylogenetic placement of a given species is likely to be predictive of its immature life history, therefore it is suggested that *O. froehlichii* sp. n. is a sponge-dwelling species.

It is emphasized that studies on the biology of immature stages is encouraged together with phylogenetic analysis. That as demonstrated by these results, the topologies can provide information about the habitat of the larvae, thus directing field studies.

A fluctuation in the position of *O. albistyla* Epler, 1986 suggests that the species belongs to the group of the saproxylophilic species. It is suggested that saproxylophilic condition is plesiomorphic as it is observed also in related basal genera (*Nilothauma* and *Beardius*).

The larval habitats of *O. albistyla*, *O. costaricensis* Epler, 1996, *O. oliveirai* Messias *et* Fittkau, 1997 and *O. sublettei* Messias *et* Oliveira, 1998 are still unknown, so both taxonomy and ecology of these groups need to be addressed in future studies.

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