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A new species of the genus *Mesosmittia* Brundin, 1956 (Diptera: Chironomidae) from the Neotropics with a cladistic analysis of the genus using quantitative characters

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Abstract

The new species *Mesosmittia museophila* from the Neotropics is described and illustrated based on male imagines. A cladistic analysis was conducted in order to assess its possible relationships with the remaining species in the genus, and it was found that *M. museophila* is the sister group of *M. mina* Sæther and these two species are closely related to *M. prolixa* Sæther. This analysis suggests that standardization is preferable to use of raw data and the latter are preferable to any statistic descriptor.

Key words: Diptera, Chironomidae, Orthocladiinae, *Mesosmittia*, continuous characters, parsimony, phylogeny, new species, South America

Introduction

The orthoclad genus *Mesosmittia* Brundin belongs to the *Pseudosmittia* group (Brundin 1956, Sæther 1977). This genus was erected by Brundin (1956) for *Spaniotoma* (*Orthocladius*) *flexuella* Edwards and placed in different genera and subgenera until reaching its actual position. For a complete nomenclatorial history see Spies (2006). The first revision of the genus was made by Sæther (1985) who described one new species for the Neotropical region, six new species for the Nearctic region, and redescribed the Palearctic species *Mesosmittia flexuella*. Later, Sæther (1996) described a new species from the Afrotropical region and established the new combination *Mesosmittia nigerrima* (Kieffer, 1918). In the same paper, Sæther established the previously two new species described by Wang and Zheng (1990) as synonyms of *Mesosmittia patrihortae*. Andersen and Mendes (2002) described four new species and recorded several Nearctic species in the Neotropics. Finally, Sæther (2006) transferred *Mesosmittia jintuoctava* Sasa to the genus *Pseudosmittia*. The genus *Mesosmittia* occurs in the Afrotropical, Palearctic, Nearctic and Neotropical regions, with the latter being the region with highest diversity.

Data on the ecological requirements of *Mesosmittia* immature stages is scarce. The larva of *Mesosmittia flexuella* was described by Strenzke (1950) and he stated that the immature stages were terrestrial. Cranston *et al.* (1989) reported adults of this species caught in emergence traps in fast flowing streams, suggesting an aquatic condition for the immature stages. Andersen and Mendes (2002) considered the records of the species described by Sæther (1985) as evidence suggesting semiaquatic habitat preferences.

In a cladistic analysis the most useful and non-controversial characters are those whose states are exclusive, but other features are also useful in systematics, such as meristic and continuous data. A problem of quantitative characters is how to treat the measured data. Pimentel and Riggins (1987) stated that descriptive statistics (e.g. mean, median, standard deviation, etc.) are sample estimates and have no phylogenetic signal. Moreover, they questioned the cladistic properties of means, standard deviations, or tests of significance that would allow them to be used in such a way. However, the authors recognized their lack of a theoretical basis to answer these questions.

Quantitative characters have rarely been included in cladistic analyses of morphological data, because the justification often given for excluding continuous characters is the difficulty in objectively assigning character states

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