

New taxa of the Lygistorrhinidae (Diptera: Sciaroidea) and their implications for a phylogenetic analysis of the family

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Abstract

New Oriental taxa of the Lygistorrhinidae - *Blagorrhina* gen. n., with *B. blagoderovi* sp. n. and *B. brevicornis* sp. n.; *Gracilorrhina gracilis* gen. n., sp. n.; and *Labellorrhina* gen. n., with *L. grimaldii* sp. n. and *L. quantula* sp. n. - are described, and two undescribed species, known only from females, are characterized. Based on this new material, the family is redefined. The phylogenetic

relationships among the taxa of Lygistorrhinidae were studied by parsimony analysis using 43 morphological characters from the adults of 25 ingroup and one outgroup species. The cladistic analysis produced 14 most parsimonious cladograms. The solution obtained suggests unambiguously the following phylogeny: *Palaeognoriste* Meunier and "*Lygistorrhina*" *asiatica* Senior-White are successively sister groups of the rest of the Lygistorrhinidae; there is a clade *Labellorrhina* + (*Gracilorrhina* + (*Blagorrhina* + ((*Seguyola* Matile + (*Loyuges*a Grimaldi & Blagoderov + *Matileola* Papp)))) with a monophyletic *Lygistorrhina* Skuse – *Probolaeus* Williston lineage as sister group. The phylogeny among the latter group remains largely unresolved.

Key words: Lygistorrhinidae, phylogeny, morphology, new taxa

Introduction

The Lygistorrhinidae is a small family of Sciaroidea that is widely distributed but restricted to tropical and subtropical regions. Our current understanding of the characters of the family is essentially based on Thompson (1975), who also reviewed the taxonomic history of the group up to that time. There are about 20 described extant species, and, because of the distinct morphological characters of the group, there has been no doubt as to the monophyly of the family. On the other hand, the proper systematic rank and the sister-group relationships of the taxon have been the subject of much controversy since Edwards (1925) ranked it as a subfamily (Tuomikoski 1966; Thompson 1975; Matile 1990a, 1990b; Matile 1997). The most recent contribution is that of Hipa and Vilkkamaa (in press) who, like Matile (1997), on the basis of a cladistic analysis, suggested a close relationship between the Lygistorrhinidae and the Mycetophilidae s. str. Recently Grimaldi and Blagoderov (2001) and Blagoderov and Grimaldi (2004) have studied phylogenies within the family, using parsimony analyses and including Mesozoic fossils in the latter study.

Our aim here is firstly to describe some new taxa discovered in the Oriental Region, and secondly, by means of a cladistic analysis, to place these taxa in the phylogenetic system of the family. We have omitted from the present paper the study of the phylogenetic relationships among the speciose *Lygistorrhina*–*Probolaeus* lineage and the question of the possible synonymy of these names (see Thompson 1975). In our phylogenetic and descriptive work, we have applied some new and previously neglected morphological characters and have also reinterpreted some of those already in use.

Material and methods

The specimens

The new material was collected mainly by using Malaise traps. These specimens were stored in ethanol before mounting. We mounted them on microscope slides in Euparal,