



Cladistic analysis of the subfamily Arsenurinae (Lepidoptera, Saturniidae) based on adult morphology

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Abstract

The family Saturniidae is distributed on all continents except polar areas, and includes about 1528 species in 162 genera, being the group with the largest diversity among Bombycoidea. Approximately 970 species are known from the New World. However, recent molecular studies indicate 1861 species in 162 genera and nine subfamilies. The family Arsenurinae consists of 63 species distributed exclusively in ten Neotropical genera, with phylogenetic relationships poorly understood. The goal of this study was to test the monophyly of the subfamily, tribes and genera using cladistic analysis of adult morphological characters. The subfamily, tribes and genera were all recovered as monophyletic groups with the following relationships among genera: (*Almeidaia* ((*Loxolomia*, *Copiopteryx*) ((*Rhescyntis*) ((*Grammopelta*, *Arsenura*) ((*Caio*) ((*Dysdaemonia*, *Titaea*) *Paradaemonia*)))))). Both tribes, Arsenurini and Almeidaiini, share several characters, but morphological study of Almeidaiini demonstrates that it also presents significant differences.

Key words: Lepidoptera, Saturniidae, Arsenurinae, cladistic analysis

Introduction

Among the Bombycoidea, the family Saturniidae presents the largest diversity. Based on data from material deposited in Brazilian institutions and bibliographic records, 1528 species of Saturniidae are known worldwide. Of those, 966 occur in the New World, at least 382 of them in Brazil (Camargo 2007). However, Regier *et al.* (2008), based on molecular studies, presented 1861 species in 162 genera and nine subfamilies. There are seven subfamilies recognized by Ferguson (1971): Arsenurinae, Ceratocampinae, Hemileucinae, Agliinae, Ludiinae, Salassinae and Saturniinae. Recently, some authors (Minet 1994; Lemaire & Minet 1998; Balcázar-Lara & Beutelspacher 2000) also included the subfamilies Oxyteninae and Cercophaninae, totaling nine subfamilies. Lemaire (1971, 1978, 1980, 1988, 1996, 2002) has published widely on Saturniidae, notably the New World subfamilies, with studies covering morphology, distribution and classification.

Arsenurinae is an exclusively Neotropical group treated as a subfamily for the first time by Jordan (1922). Bouvier (1930) named the group Rhescyntinae and some subsequent authors continued using this name (Schüssler 1936; Michener 1952; Ferguson 1971). Other taxonomic combinations have also been proposed: Travassos & Noronha (1968) described a new family Dysdaemoniidae, including the genera *Caio*, *Dysdaemonia*, *Titaea* and *Paradaemonia* based on the median spurs of the hind legs, but this family is currently not used by most authors.

The most evident external morphological characteristics of Arsenurinae are: brown or gray color (except in *Almeidaia*); hind wings with extensions in the form of a tail, especially on males; and presence of a hair tuft on both sides of the first abdominal segment, at the spiracular line. The antennae, wing venation and genitalia are variable within the group. For example, the uncus of the male genitalia may vary from simple to trifold, and