



## Article

### Cladistic analysis and revision of the *obstinata* group, genus *Chinavia* Orian (Hemiptera: Pentatomidae)

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#### Abstract

The monophyletic genus *Chinavia* Orian includes 80 species of which 18 are endemic to Brazil. The general morphology of the species allows the recognition of different groups of species, however, the monophyly and the phylogenetic relationships of those groups has not been investigated. We present here the first cladistic analysis involving species of *Chinavia*, with particular focus on the *obstinata* group, which currently includes 3 species: *Chinavia difficilis*, *C. obstinata* and *C. napaea*. Our results based on 40 morphological characters support the monophyly of the *obstinata* group and its relationship with other species of *Chinavia*. Diagnosis and a formal description of the *obstinata* group, as well as redescriptions and illustrations of each species, are given.

**Keywords:** Atlantic rain forest, genitalia, morphology, phylogeny, taxonomy

#### Introduction

The genus *Chinavia* Orian was originally proposed to include nine species from the Afrotropical region previously included in *Acrosternum* Fieber or *Nezara* Amyot & Serville (Orian 1965). Currently, about 80 species are known, distributed in the Afrotropical, Nearctic and Neotropical regions (Linnavuori 1982, Rolston 1983, Schwertner & Grazia 2007), with several species showing restricted distribution. Schwertner (2005) established the monophyly of the genus based on the following synapomorphies: apices of the processes of capsula seminalis tapering at apex, absent superior process of the pygophore dorsal rim and parameres not geniculated. The Afrotropical species *Chinavia rinapsa* Dallas was defined as the sister-group of all the remaining species.

Within *Chinavia* it is possible to recognize several groups of similar species based on characters of general and genitalic morphology (Schwertner & Grazia 2007), although the monophyly of those groups has not been tested. The *obstinata* group includes currently 3 species: *Chinavia difficilis* (Stål), *Chinavia napaea* (Stål) and *Chinavia obstinata* (Stål). The species are restricted to the southern Brazilian Atlantic Forest and part of the coastal plain of the Pampa biome (sensu IBGE 2004), from the states of Rio de Janeiro to Rio Grande do Sul, Brazil (Schwertner & Grazia 2007; Fig. 1). A fourth related species, *Chinavia panizzii* Frey-da-Silva & Grazia was described recently from the Paraná state and compared to *C. obstinata* (Frey-da-Silva & Grazia, 2001). The differences used to separate them were the presence of dorsal black spots on the cicatrices of the pronotum and on the connexival segments. Based on the study of male and female genitalia, these characteristics were recognized as polymorphisms by Schwertner & Grazia (2007), who synonymized *C. panizzii* and *C. obstinata*. More recently, Campos et al. (2012) recorded variation in the presence of the black spots among a population of *C. obstinata* in Santa Catarina state.

All species of the *obstinata* group can be recognized based upon three shared characters among *Chinavia*: body mostly green (i.e. without bands, maculae or spots of any color other than the small black spots on dorsal surface), abdominal spine surpassing the hind coxae, and flaps of ventral rim of the pygophore with an apical angle projected in a hook-like process (Schwertner & Grazia 2007).