



## Phylogenetic studies in the South American tribe Dichroplini (Orthoptera: Acrididae: Melanoplinae): is the Paranaense-Pampeano informal genus group a natural clade?

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### Abstract

The Dichroplini genera *Scotussa*, *Leiotettix*, *Ronderosia*, *Atrachelacris*, *Chlorus*, *Eurotettix* and *Dichromatos* have been grouped into the “Paranaense-Pampeano” informal genus group, based on characters of the male genitalia. However, recent molecular phylogenetic analyses showed weak support values or no support at all for this group. In this study, we used molecular and morphological characters to test the monophyly of this informal genus group. Morphological characters included aspects of the general morphology, and male and female genitalia as well. Whereas the molecular data was based on one mitochondrial gene: cytochrome oxidase I. Independent and combined phylogenetic analyses of the data were performed under both unweighted and implied weighting parsimony. Our results showed that, when only molecular data is considered, the “Paranaense-Pampeano” informal genus group is not recovered. However, the group is monophyletic according to morphological and combined analyses. The “Paranaense-Pampeano” informal genus group is considered to be a natural clade; therefore, we propose the genus group name *Scotussae*. As a final remark, the molecular data provided in most cases the same evidence of relationships as morphology.

**Key words:** grasshoppers, genitalia, COI, implied weights, phylogeny

### Introduction

The tribe Dichroplini is the most diversified group of South American Melanoplinae, constituted by 26 genera and 140 species described so far. Members of this tribe are usually the dominant group, both in number of species and individuals, in most of grasshopper communities in South American grasslands (Cigliano et al., 2000).

Although the state of systematic knowledge of the South American Melanoplinae has grown considerably during the last decades, their phylogenetic relationships still remain partially unknown (Amedegnato *et al.* 2005). Several attempts to divide the group have been conducted by proposing the tribes Dichroplini, Parascopini, Jivarini, and the informal genus group “Paranaense-Pampeano” (Amedegnato 1977; Carbonell et al., 2006; Ronderos, 1985; Eades & Otte, 2009). The “Paranaense-Pampeano” informal genus group is constituted by the genera *Scotussa*, *Leiotettix*, *Chlorus*, *Atrachelacris*, *Ronderosia*, *Eurotettix* and *Dichromatos*, and was defined mostly based on characters of the male genitalia (i.e. apical valves of aedeagus cylindrical in cross section, without mid-longitudinal furrow, diverging caudally; sheath of aedeagus with mid longitudinal cleft in middle lobe, and lateral lobes developed) (Ronderos 1985; Cigliano and Ronderos 1994).

A recent phylogenetic study based on molecular evidence has shown that the tribes Dichroplini and Jivarini emerge as monophyletic assemblages (Chapco 2006). Within the Dichroplini tribe, the informal genus