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Taxonomic circumscription of *Adenomera martinezi* (Bokermann, 1956) (Anura: Leptodactylidae: Leptodactylinae) with the recognition of a new cryptic taxon through a bioacoustic approach

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Abstract

In this paper, we provide a taxonomic circumscription of *Adenomera martinezi* from its type locality (Cachimbo, southwestern State of Pará) since its description (57 years ago) based on a newly collected series of eleven adult topotypes, and through a bioacoustic approach, recognize an undescribed cryptic taxon under this nominal species, which is widely distributed in central and northern Brazil. *Adenomera martinezi* and *Adenomera saci* **sp. nov.** can be diagnosed from all congeners by their distinctive 4–6 symmetrically arranged rows of longitudinal dark-colored spots on dorsum. They differ from each other through advertisement call structure, pulsed in *Adenomera martinezi* (audibly pulsed to the human ear), and non-pulsed in *Adenomera saci* **sp. nov.** (a whistle to the human ear). The recognition of *Adenomera saci* **sp. nov.** has conservation implications. Based on our assumed distribution of *A. martinezi* and *Adenomera saci* **sp. nov.**, the IUCN conservation status of *A. martinezi* requires a reassessment, inasmuch as we herein reconsider this species, as far as we know, as endemic to Cachimbo, southwestern State of Pará, Brazil. The 2004 extinction risk assessment included both *A. martinezi* and *Adenomera saci* **sp. nov.**, and the conservation status category of ‘Least Concern’ might only be applied to *Adenomera saci* **sp. nov.**, a widely distributed and abundant species in central and northern Brazil.

Key words: *Adenomera saci* **sp. nov.**, Cachimbo, Chapada dos Veadeiros, Cerrado, Conservation status, taxonomy

Introduction

The species is a widely used and fundamental unit of analysis in biology, although species concepts and delineation of species boundaries is a longstanding biological and philosophical issue (Dayrat 2005; de Queiroz 2007; Vences & Wake 2007). The problem of species delineation and identification can be exemplified by groups that exhibit little morphological variation (Jaiswara *et al.* 2012), the so-called cryptic species. Bickford *et al.* (2007) extensively discussed definitions and applicability of this term, being defined as typically closely related species that are very similar and difficult to distinguish morphologically. Integrative taxonomy has been proposed as a framework to bring together conceptual and methodological developments, employing non-morphological suites of characters, as molecular phylogenetics and bioacoustics, for the unraveling of taxonomic complexity and uncovering undetected diversity under cryptic species complexes (Heyer *et al.* 1996; Padial & De la Riva 2009; Glaw *et al.* 2010; Padial *et al.* 2010).

Frogs have species recognition and mate choice systems that rely on non-morphological characteristics (advertisement calls), and might harbor a great cryptic diversity (Bickford *et al.* 2007). Integrating independent lines of evidence to properly address underlying unresolved taxonomic complexity might, thereafter, lead to elucidation of biological identities in *Adenomera*, uncovering an expected cryptic diversity within this group of frogs, whose comprising taxa share general morphology relatedness, and for which complementary datasets (e.g. acoustic, molecular) are often needed for taxonomic resolution (Heyer 1984; Angulo & Icochea 2010).