



Molecular, morphology and bioacoustic data suggest Bolivian distribution of a large species of the *Leptodactylus pentadactylus* group (Amphibia: Anura: Leptodactylidae)

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Abstract

During an inventory and ecological study of amphibians in the lowlands of Bolivia, we recorded two populations of a large representative of the *Leptodactylus pentadactylus* species group (*sensu* Heyer 1979, 2005) formerly assigned to *L. labyrinthicus*. However, analyses of morphology, advertisement call, and Bayesian inference of mitochondrial DNA (16S) provided evidence for the heterospecific status in regard to *L. labyrinthicus*. Using an integrative taxonomic approach we herein assign these populations tentatively to *L. vastus*. This poses a range extension of more than 2000 km west-south-west and suggests that sampling between the known distribution areas is needed. The signal red coloration of thighs and groin may be a diagnostic character to distinguish this species from other species of the group. Our results suggest that a taxonomic revision of the whole species group (including Bolivian populations studied herein) is needed. A far more comprehensive sampling throughout its distribution area and further studies on species boundaries and phylogeography in this group is necessary to actually understand the taxonomy of this difficult group.

Key words: Bioacoustics, Chiquitano Region, distribution extension, *Leptodactylus pentadactylus* group, morphology, mtDNA.

Introduction

The genus *Leptodactylus* currently comprises 89 species distributed in Southern North America, South America, and the West Indies (Frost 2011). The *pentadactylus* group of the genus *Leptodactylus* contains 19 species. In a recent revision, Heyer (2005) provided an extensive discussion of morphological variation of this species group including species from Middle America, northern and Central South. After Heyer's (1979; 2005) definition, 13 species with at least 97 mm snout-vent-length are assigned as "large" members of this group: *Leptodactylus flavopictus*, *L. fallax*, *L. knudseni*, *L. labyrinthicus*, *L. laticeps*, *L. myersi*, *L. paraensis*, *L. pentadactylus*, *L. peritoakites*, *L. rhodomerus*, *L. savagei*, *L. turimiquensis* and *L. vastus*.

Bolivian "large" *Leptodactylus* were traditionally assigned to *L. labyrinthicus* in the literature (e.g., de la Riva *et al.* 2000; Jansen 2009; Jansen *et al.* 2009; Schulze *et al.* 2009). However, Heyer (2005) suggested that the taxonomic status of Bolivian populations should be re-evaluated, because he could not assign several Bolivian specimens based on morphological characters to any of the species *L. labyrinthicus*, *L. turimiquensis* or *L. vastus*. This view gained support by a recent integrative inventory of Bolivia's lowland amphibians including some samples studied herein (Jansen *et al.* 2011). The respective analyses suggested that the studied populations in Bolivia's lowlands are divergent from *L. labyrinthicus* and most similar to *L. vastus*. Herein, we provide more evidence for this assumption by presenting additional data on morphology, advertisement call and Bayesian analysis of 16S, in order to confirm the conspecific status of two studied populations and to discuss the taxonomic identity of these populations.