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Cryptic species and hybridization in the *Anolis polylepis* complex, with the description of a new species from the Osa Peninsula, Costa Rica (Squamata: Polychrotidae)

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Abstract

Based on differences in hemipenial morphology we recognize two species of anoles related to *Anolis polylepis*: *Anolis polylepis* (Pacific versant of central and southern Costa Rica and western Panama, excluding the Osa Peninsula) and a species described herein which is restricted to the Osa Peninsula. The two species differ in hemipenial morphology (hemipenis bilobed in *A. polylepis* versus unilobed in the species from the Osa Peninsula) but show no discernable differences in external morphology (i.e., morphometrics, scalation, coloration, male dewlap). We therefore consider them to be cryptic species. At the neck of the Osa Peninsula where the ranges of the two species meet we detected a narrow (about 1 km wide) hybridization zone in which only individuals with an intermediate hemipenial morphology occur.

Key words: *Anolis*; Central America; Cryptic Species; Hybridization; New species; Polychrotidae; Reptilia; Squamata

Resumen

Basados en diferencias en la morfología del hemipene reconocemos dos especies de anolis relacionados con *Anolis polylepis*: *A. polylepis* (vertiente Pacífica del centro y sur de Costa Rica y oeste de Panamá, excluyendo la Península de Osa) y la especie aquí descrita la cual está restringida a la Península de Osa. Las dos especies difieren entre sí en la morfología del hemipene (hemipene bilobulado en *A. polylepis* y unilobulado en la especie de la Península de Osa) pero no muestran diferencias discernibles en su morfología externa (morfometría, folidosis, coloración, abanico gular del macho), por lo que las consideramos especies crípticas. En el cuello de la Peninsula de Osa las areas de distribución de ambas especies sobrelapan en la vecindad del pueblo de Rincón de Osa y se detectó una estrecha zona de hibridación (de aproximadamente 1 Km. de ancho) donde solamente se encontró individuos con una morfología intermedia del hemipene.

Introduction

Cryptic species are two or more distinct species that were inlcuded in a single species due to their similarity in external morphology (for a review of cryptic species see Pfenninger & Schwenk 2007). Examples of such cryptic species are known for several species pairs and complexes in Central American anoles (e.g. Köhler *et al.* 2007, Köhler & Sunyer 2008, Köhler 2009).

Recent field research in Costa Rica and western Panama has revealed the presence of yet another pair of cryptic species of anoles. We studied the geographic variation of hemipenial and external morphology in lizards currently referred to as *Anolis* (or *Norops*) *polylepis*. This species is distributed along the Pacific versant of central and southern Costa Rica and western Panama, including the Osa Peninsula. In 1873, Peters described the new species *Anolis polylepis* based on a series of twelve syntypes that originated from "Chiriqui". Barbour and Loveridge (1929) and Barbour (1934) indicate that the Museum of Comparative Zoology (MCZ) had received two of the original syntypes in exchange (now MCZ 21962-63). However, we received on loan from Museum für Naturkunde der Humboldt–Universität zu Berlin (ZMB), Berlin, Germany, eleven specimens supposedly the

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