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## A new species of *Riama* Gray, 1858 (Squamata: Gymnophthalmidae) from the Tropical Andes

VANESSA AGUIRRE-PENAFIEL<sup>1</sup>, OMAR TORRES-CARVAJAL<sup>1,\*</sup>, PEDRO M. SALES NUNES<sup>2,3</sup>, MIKA R. PECK<sup>4</sup> & SIMON T. MADDOCK<sup>5,6</sup>

<sup>1</sup>Museo de Zoología, Escuela de Ciencias Biológicas, Pontificia Universidad Católica del Ecuador, Av. 12 de octubre y Roca, Aptdo. 17-01-2184, Quito, Ecuador.

<sup>2</sup>Universidade de São Paulo, Instituto de Biociências, Departamento de Zoologia. Caixa Postal 11.461, CEP 05422-970, São Paulo, SP, Brazil.

<sup>3</sup>Universidade Federal de Pernambuco, Centro de Ciências Biológicas, Departamento de Zoologia, Av. Professor Moraes Rego, s/n. Cidade Universitária CEP 50670-901, Recife, PE, Brazil.

<sup>4</sup>Department of Life Sciences, University of Sussex, Brighton, BN19QJ, UK.

<sup>5</sup>Department of Life Sciences, The Natural History Museum, London, SW7 5BD, UK.

<sup>6</sup>Department of Genetics, Evolution and Environment, University College London, London, WC1E 6BT, UK.

\*Corresponding author. E-mail address: [omartorcar@gmail.com](mailto:omartorcar@gmail.com)

### Abstract

A new species of *Riama* lizard from the western slopes of the Andes in northern Ecuador is described herein. Morphologically, *Riama yumborum* sp. nov. can be distinguished from all other congeners by having an incomplete nasoloreal suture and a cylindrical hemipenial body with diagonally orientated flounces on its lateral aspect. Phylogenetic analyses of mitochondrial and nuclear DNA support the monophyly of the new species and its sister taxon relationship with *R. labionis*, which occurs allopatrically.

**Key words:** Cloudforest, DNA, Ecuador, neotropics, systematics

### Introduction

The Neotropical lizard genus *Riama* Gray, 1858 includes 30 recognized species that occur throughout the Andes of central Peru, Ecuador, Colombia, Venezuela, the Cordillera de la Costa of Venezuela and Trinidad and Tobago (Doan & Castoe 2005). Similar to other gymnophthalmid lizards, the alpha diversity of *Riama* seems to be underestimated as revealed by the large percentage of species (26%) described in the last decade alone (Doan & Schargel 2003; Köhler & Lehr 2004; Rivas *et al.* 2005; Arredondo & Sánchez-Pacheco 2010; Sánchez-Pacheco 2010a; Sánchez-Pacheco *et al.* 2011, 2012). Moreover, none of these descriptions are based on molecular evidence, which has been shown to accelerate the discovery of undetected diversity (Bickford *et al.* 2007).

*Riama* lizards occur mostly along the Tropical Andes, the world's leading hotspot in diversity and endemism of terrestrial vertebrates and vascular plants (Myers *et al.* 2000). A large percentage of this diversity is concentrated on the slopes of the Andes, including high elevation cloudforests. Here we contribute to the knowledge of the diversity of the Tropical Andes by describing a new species of *Riama* from a cloud forest in northwestern Ecuador based on morphological and molecular evidence.

### Material and methods

**Morphological data.** Specimens examined in this study are listed in Appendix 1 and are deposited in the herpetological collection of Museo de Zoología (QCAZ), Pontificia Universidad Católica del Ecuador, Quito, Ecuador. We follow the terminology of morphological characters proposed by Kizirian (1996). Data for some species were obtained from the literature (Peters 1862; Boulenger 1908; Uzzell 1958; Doan & Schargel 2003;

## Discussion

*Riama yumborum* differs morphologically from its sister species, *R. labionis* (character states in parentheses) in having an incomplete nasoloreale suture (suture absent), striated dorsal scales (dorsals with rounded keel), usually three postoculars (two postoculars), and in lacking a supralabial-subocular fusion (supralabial and subocular scales fused). *Riama labionis* occurs allopatrically 70 km SW from the known distribution of *R. yumborum* between 1500–2000 m (Fig. 7).

The geographically closest species that is morphologically similar to *Riama yumborum* is *R. unicolor*; however, these species are knowingly separated by an elevational range: whereas *R. yumborum* occurs at 1580–1591 m, *R. unicolor* is found above 1775 m (Maddock *et al.* 2011). These two species are clearly distinct from each other based on both morphology and molecular data, with *R. unicolor* forming the sister species to a clade containing *R. yumborum*, *R. labionis*, *R. stigmatoral*, *R. meleagris* and *R. cashcaensis*. Although the sympatric species *R. oculata* was not analyzed herein, unpublished data strongly suggest that this species is distantly related to *R. yumborum*.

The presence of 13 femoral pores on the left leg of the holotype of *Riama yumborum* is potentially a useful character for distinguishing the new species from many conspecifics; however, as only a single leg from a single male had undamaged pores that could be counted, this character should be treated with caution.

The recent discoveries of the gymnophthalmid *Alopoglossus viridiceps* (Torres-Carvajal & Lobos 2014) and the new species of *Riama* described in this paper increase our knowledge about the biodiversity of northwestern Ecuador and provides more support for conserving the threatened forests (Cerón *et al.* 1999) of the region. It is likely that further surveys will reveal additional undescribed species. The forests surrounding the town of Nanegal have now been found to harbor two endemic *Riama* species (*R. yumborum* and *R. oculata*).

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