A new microhylid frog, genus Rhombophryne, from northeastern Madagascar, and a re-description of R. serratopalpebrosa using micro-computed tomography

MARK D. SCHERZ1, BERNHARD RUTHENSTEINER1, MIGUEL VENCES2 & FRANK GLAW1,3

1Zoologische Staatssammlung München, Münchhausenstraße 21, 81247 München, Germany. E-mail: mark.scherz@gmail.com; BRuthensteiner@zsm.mwn.de; Frank.Glaw@zsm.mwn.de
2Division of Evolutionary Biology, Zoological Institute, Technical University of Braunschweig, Mendelssohnstr. 4, 38106 Braunschweig, Germany. E-mail: m.vences@tu-bs.de
3Corresponding author. E-mail: Frank.Glaw@zsm.mwn.de

Abstract

The rainforests of the Marojejy massif in northern Madagascar are a well-known hotspot of amphibian species diversity and endemism. In the present paper, we re-describe Rhombophryne serratopalpebrosa (Guibé 1975), a cophyline microhylid frog from high altitude on this massif, based on a re-examination of its holotype, and describe Rhombophryne vaventy sp. nov., using characters of external morphology and osteology, illustrated by pdf-embedded comparative 3D models of their skeletons. Rhombophryne serratopalpebrosa differs from R. vaventy sp. nov. by smaller size (28 mm snout-vent length vs. 52.9 mm), skin texture (granular vs. rough and tubercular skin respectively), supratympanic fold shape (strong, long and straight reaching the eye vs. curved and not extending anteriorly beyond the tympanum), relative tympanum diameter (78% vs. 41% of eye diameter), shape of the postchoanal prevomerine palate, shape of the footplate of the columella, length of prepollex, and by other subtle osteological features. Morphological comparisons suggest that a specimen from Ambolokopatrika assigned to R. serratopalpebrosa in previous genetic studies might belong to yet another undescribed species, closely related to R. vaventy sp. nov., whereas DNA sequences of the topotypic R. serratopalpebrosa remain unknown. We therefore emphasise the need for collecting additional material from high altitudes of the Marojejy massif to understand the systematics, as well as the natural history, of this poorly known species. For the new species described herein, we propose a Red List threat status of Vulnerable, in line with other Marojejy endemics from a similar altitude.

Key words: Amphibia, Anura, Microhylidae, Rhombophryne vaventy sp. nov., Madagascar, micro-computed tomography

Introduction

Microhylid frogs are one of the most successful anuran lineages, consisting of more than 500 species distributed broadly across tropical and subtropical regions of the planet (Köhler & Günther 2008; de Sá et al. 2012; Frost 2014). Their diversity is unevenly distributed, however; more than half of all known microhylid species are endemic to just two large islands: New Guinea and Madagascar. Three of the eleven currently recognised microhylid subfamilies are endemic to Madagascar: Cophylinae, Dyscophinae, and Scaphiophryninae (Blommers-Schlösser & Blanc 1991). Of these three subfamilies, the Cophylinae are by far the most diverse, consisting of around 50 described species in seven genera (in contrast to the 3 and 11 species of Dyscophinae and Scaphiophryninae respectively, see Raselimanana et al. 2014). Several additional candidate species of cophylines have been identified by recent molecular studies (Andreone et al. 2005; Wollenberg et al. 2008; Vieites et al. 2009; Perl et al. 2014), and await formal description.

The centre of diversity of the Cophylinae is in the moist north of Madagascar (Wollenberg et al. 2008). While several species of cophyline frogs have recently been discovered from arid parts of western Madagascar (Glaw et al. 2007; Andreone & Randrianirina 2008; Raselimanana 2013), the majority of species are restricted to rainforests or moist high-altitude areas along the east coast. These frogs exhibit a wide range of habits, from entirely arboreal frogs possessing terminal discs on the phalanges, to terrestrial and fossorial frogs lacking these terminal discs. This
Acknowledgements

We wish to thank Thomas Wesener (ZFMK, Bonn) for the identification of the millipede in the stomach of *R. vaventy*, Annemarie Ohler (MNHN, Paris) for the loan of the holotype of *R. serratopalpebrosa*, Roger-Daniel Randrianaina for his assistance in the field, the Malagasy authorities for issuing the necessary permits, and two anonymous reviewers for their helpful suggestions.

References


