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Taxonomy and natural history of arboreal microhylid frogs (*Platypelis*) from the Tsaratanana Massif in northern Madagascar, with description of a new species

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Abstract

We review the taxonomic status of microhylid frogs of the genus *Platypelis* occurring on the Tsaratanana mountain range in northern Madagascar. Two species have originally been described from the region, *Platypelis alticola* and *P. tsaratananaensis*. We found *P. alticola* at elevations from 1589–2429 m, with the population at 1589 m being genetically divergent (pairwise sequence divergence in the 16S rRNA gene fragment 3.8%). The species was mainly found in bamboo segments accessible via small holes, and its vocalization was a tonal single-note call repeated in long regular series. The identity of *P. tsaratananaensis* was uncertain for many years. Based on comparisons with the type material we conclude that the name should be applied to a common species in the Tsaratanana region morphologically similar to *P. pollicaris* but distinguished by a double-note advertisement call, repeated in long series in *P. tsaratananaensis* (vs. single-note in *P. pollicaris*), relative length of toes, and size of the prepollex in males (larger in *P. pollicaris*). Populations of *P. tsaratananaensis* from several nearby forests were genetically similar to those from the main Tsaratanana Massif. The species is nidicolous with 1–27 embryos and non-feeding larvae in waterfilled bamboo segments. Oocyte number is correlated with female size, and larger adult specimens were found in bamboo segments situated higher above the ground. A new species, *Platypelis olgae sp. nov.*, is described from two sites at ca. 2500 m elevation on the Tsaratanana, based on its genetic and morphological differentiation. It differs from other *Platypelis* by small body size (adult snout-vent length 20–22 mm) the absence or rudimentary state of vomerine teeth, green to yellow ventral color, and absence of contrasting and sharply delimited symmetrical dark dorsal patches. *Platypelis alticola*, *P. tsaratananaensis* and *P. olgae sp. nov.* were regularly parasitized by mites probably of the genus *Endotrombicula*.

Key words: Amphibia, Anura, Microhylidae, Cophylinae; *Platypelis alticola*; *Platypelis tsaratananaensis*; *Platypelis pollicaris*; *Platypelis olgae sp. nov.*; Tsaratanana Massif; taxonomy; phylogeny; phytotelmic breeding; bamboo.

Introduction

Of the five amphibian families present on Madagascar, the Microhylidae is the second most species rich one, with over 70 nominal species, being only outnumbered by the Mantellidae with about 200 species (AmphibiaWeb 2012). Malagasy microhylids are classified in three subfamilies (Cophylinae, Dyscophinae, Scaphiophryinae) all endemic to the island, of which the Cophylinae account for the highest number of species and show the highest diversity of ecological adaptations (Andreone *et al.* 2005b). Cophylines are also remarkable because they contain a high proportion of range restricted species (Wollenberg *et al.* 2008). They are nidicolous with non-feeding, endotrophic larvae which develop based on their yolk reserves only in water-filled tree holes or similar cavities, or in terrestrial jelly or foam nests (Blommers-Schlösser 1975; Blommers-Schlösser & Blanc 1991; Grosjean *et al.* 2007; Glaw & Vences 2007).

Among cophylines, the two genera *Platypelis* Boulenger and *Cophyla* Boettger are very similar to each other, and at present knowledge cannot be reliably distinguished based on external morphology (Glaw & Vences 2007),