



The systematics of *Boulengerula fischeri* (Amphibia: Gymnophiona: Caeciliidae) based on morphological and molecular data

DAVID J. GOWER^{1,4}, ANNA PAPADOPOULOU¹, THOMAS M. DOHERTY-BONE¹, FABIO PUPIN², DIEGO SAN MAURO¹, SIMON P. LOADER³ & MARK WILKINSON¹

¹Department of Zoology, The Natural History Museum, Cromwell Road, London SW7 5BD, UK

²Museo Tridentino di Scienze Naturali, Via Calepina 14, I-38122 Trento, Italy

³University of Basel, Institute of Biogeography, Department of Environmental Sciences, Basel 4056, Switzerland

⁴Corresponding author. E-mail: d.gower@nhm.ac.uk

Abstract

Eight new specimens are reported for the caecilian amphibian *Boulengerula fischeri*, a species known in detail previously only from its holotype collected in 1987. The new material was collected at the type locality in Rwanda in 2009, and is used to expand and refine the morphological characterization of the species. Mitochondrial and nuclear gene sequences were used to assess the phylogenetic position of *B. fischeri* in the context of a recent molecular phylogeny of six of the seven other species of *Boulengerula* (from Kenya and Tanzania). Among nominal species, only *B. denhardti* remains to be included in molecular phylogenetic studies of *Boulengerula*. *Boulengerula* is recovered as monophyletic, with either *B. fischeri* or (more probably) *B. boulengeri* sister to all other sampled species. There are at least three deep lineages within *Boulengerula*: (1) *B. boulengeri*, (2) *B. fischeri*, and (3) all other Eastern Arc Mountain and Coastal Forest species from Kenya and Tanzania. The status of *Afrocaecilia*, a genus erected by Taylor in 1968 to contain all *Boulengerula* except *B. boulengeri*, is not yet resolved.

Key words: Africa, *Afrocaecilia*, Albertine Rift, caecilian, DNA, Eastern Arc Mountains, phylogenetics, Rwanda

Introduction

Boulengerula fischeri Nussbaum & Hinkel in Fischer & Hinkel, 1992 is one of seven nominate species of this East African genus of caecilian amphibian (Gymnophiona). This species was described on the basis of a single specimen from Rwanda collected in 1987 (Nussbaum & Hinkel, 1994). One additional specimen from an unspecified locality in the Albertine Rift region was reported by Behangana *et al.* (2009), Herrel & Measey (2010) presented locomotory kinematic data for a single field-collected specimen, and a photograph of a specimen appears on the CalPhotos website (<http://calphotos.berkeley.edu>). Taylor (1968) partitioned *Boulengerula* Tornier, transferring all but the type species (*B. boulengeri*) to his new genus *Afrocaecilia*. Following Nussbaum & Hinkel (1994), the latter genus is currently regarded as a synonym of *Boulengerula* (e.g., Wilkinson & Nussbaum, 2006), but monophyly of the species transferred by Taylor (1968) to *Afrocaecilia* (Loader *et al.*, in press) has placed this in some doubt. *Boulengerula fischeri* was not known to Taylor, and it was one of only two nominal species (the other being *B. denhardti*, not considered valid by Taylor) not sampled in Loader *et al.*'s (in press) molecular phylogeny of *Boulengerula*. Herrel & Measey (2010: fig 2) depicted *B. fischeri* as sister to *B. taitanus* Loveridge (the only other *Boulengerula* in their tree) but cite only Roelants *et al.* (2007) as a source though the latter study did not include *B. fischeri*. During herpetofaunal surveys in Rwanda in 2009, new specimens of *B. fischeri* were collected that have enabled a reassessment of the systematics of this poorly known species on the basis of both morphological and DNA sequence data.