



Two new species of *Callulina* (Amphibia: Anura: Brevicipitidae) from the Nguru Mountains, Tanzania

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Abstract

Two new species of *Callulina* are described from the Nguru Mountains, one from the main Nguru South block (*C. hanseni* sp. nov.) and one from the outlying mountain fragment of the Nguru in Kanga Forest Reserve (*C. kanga* sp. nov.). The species are diagnosed based on a combination of morphological, acoustic and molecular data. An updated key to the species of all the known *Callulina* is provided. The conservation status of the two species is examined and, based on highly restricted distributions and ongoing threat to their Nguru Mountain habitats, we recommend a Critically Endangered categorisation. Additional species of *Callulina* remain to be described from the Nguru Mountains, underlying the extraordinary diversity of the genus in this area.

Key words: Brevicipitidae, Eastern Arc Mountains, Endemism, Kanga, Nguru South Forest Reserve

Introduction

Recent research on the brevipitid genus *Callulina* Nieden 1911 has seen a substantial increase in the number of species recognised (e.g. de Sá *et al.* 2004; Loader *et al.* 2009a; Loader *et al.* 2010; see Figure 1). These new species have small ranges, revealing a high degree of endemism in the Eastern Arc Mountains (EAM), a global biodiversity hotspot (Myers *et al.* 2000). Prior to the recent taxonomic work, the single species described for the genus, *C. kreffti* Nieden, 1911, was thought to have an almost continuous distribution throughout the montane forests of the EAM, extending far beyond its type locality of Amani in the East Usambara. However, material from beyond the East Usambara has proven to not be conspecific with *C. kreffti*. Furthermore, revision of material from northern EAM ranges (Taita Hills, Pare and Usambara Mountains) revealed distinct populations restricted to single montane areas that have been described as five separate species: *C. kisiwamsitu* de Sá *et al.*, 2004, *C. dawida* Loader *et al.*, 2009a, *C. laphami* Loader *et al.*, 2010, *C. shengena* Loader *et al.* 2010, and *C. stanleyi* Loader *et al.*, 2010. The high degree of endemism in *Callulina* species north of the Usambara makes it highly likely that populations south of the Usambara represent additional new species (Loader *et al.* 2010).

Menegon *et al.* (2008) compiled a list of the amphibians of the Nguru Mountains that built on earlier survey work published by Emmrich (1994). In Menegon *et al.*'s list four new species of *Callulina* were documented but not described. These four species were identified as being distinct on the basis of preliminary morphological and molecular data. This included three species found in Nguru South Forest Reserve blocks (species denoted 1–3), and one species restricted to Kanga Forest Reserve (species 4). Further surveys were conducted in the Nguru in 2008 (Loader *et al.* 2009b; Menegon *et al.* 2009). The Nguru *Callulina* material has now been examined, using morphology, acoustic recordings and molecular comparisons, and two of the new