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The King of the Dwarves: a new cryptic species of Dainty Frog (Anura: Pyxicephalidae: *Cacosternum*) from the eastern Great Escarpment of South Africa

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Abstract

Phylogenetic reconstruction using the mitochondrial 16S marker shows the presence of a cryptic species of *Cacosternum* (Anura: Pyxicephalidae) from the eastern Great Escarpment of South Africa, supporting the Greater Maputaland-Pondola-nd-Albany region of vertebrate endemism. Bioacoustic and morphological characteristics, in conjunction with colouration differences, allow the description of this cryptic species. Tadpoles and details of life history are described.

Key words: Amphibia, endemism, hotspot, grassland, cryptic species

Introduction

The genus *Cacosternum* has recently been revised by Channing *et al*. (2013) and now consists of 15 recognised species with more cryptic species expected to occur in the *Cacosternum boettgeri* complex (Poynton *et al*. 2004; Channing *et al*. 2005; Channing & Schmitz 2008; Du Preez & Carruthers 2009). During a recent search to find the elusive Amatola Toad (*Vandijkophrynus amatolicus*) (see Conradie & Tarrant 2011; Tarrant & Cunningham 2011) in the Hogsback area, South Africa, a frog species referable to the genus *Cacosternum* was collected. Various features of the ventral colouration, morphology, vocalisation, and level of genetic divergence all indicated that these individuals are not referable to any known *Cacosternum* species, and I therefore take this opportunity to describe them as a new species.

Material and methods

Sampling. Specimens were collected on the escarpment around Hogsback, Eastern Cape Province, South Africa in early October 2011 (Fig. 1). Specimens were humanely euthanized by submerging them in tricaine methanesulfonate (MS222) solution, after which they were formalin-fixed for 48 hours and transferred to 70% ethanol for long-term storage in the herpetological collection of the Port Elizabeth Museum (PEM), South African Institute for Aquatic Biodiversity (SAIAB) and National Museum Bloemfontein (NMB). Prior to formalin fixation, tissue samples from thigh muscle or tail clippings (tadpoles) were taken, and stored in 96% ethanol (Table 1). Two breeding pairs collected spawned overnight. Eggs were kept and raised to metamorphosis at the PEM and preserved in two day intervals in 10% buffered formalin.

Morphological analysis. Specimens were measured to the nearest 0.1 mm using digital callipers under a dissecting microscope. The same set of measurements as in Channing *et al*. (2013) were taken: snout-urostyle length (SUL, distance from the tip of the snout to the end of the urostyle); the maximum tibia length (TIB, measured on the bent hind limb); the length of the foot (FOT, measured from the proximal end of the inner metatarsal tubercle to the tip of the fourth toe on the fully extended foot); the eye-nostril distance (EN, measured

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Highlands may produce more cryptic species. In isolated montane regions (forest and grasslands) species over time speciate resulting in the formation of narrow endemics and candidate new species, especially evident in the Afromontane forested inselbergs of northern Mozambique (reptiles—Branch and Bayliss 2009; Branch & Tolley 2010; Portik *et al.* 2013, bats—Taylor *et al.* 2010, crustaceans—Daniels & Bayliss 2012). Similar trends are shown for the Great Escarpment of southern African, eg. Berg adders (*Bitis atropos*—Kelly *et al.* in process) and Short-headed Legless Lizards (*Acontias breviceps*—Conradie *et al.* in process).

Clark *et al*. (2009) described the Sneeuberg region as a floristic centre of endemism. Furthermore Clark *et al.* (2011) define the Sneeuberg, Great Winterberg-Amatolas and Stormberg as the Cape Midlands Escarpment, which have a high level of both floristic and vertebrate endemism. Perera *et al.* (2011) suggested the inclusion of sections of the Great Escarpment, from the Amatola-Winterberg-Sneeuberg Mountains (AWS), into the larger Maputaland-Pondoland-Albany (MPA) biodiversity hotspot on grounds of high level of vertebrate endemism. This new species adds another endemic species to the AWS list of endemic to near endemic species; eg. *Afroedura amatolica* (Amatola Flat Gecko)—Least Concern, *Afroedura karroica* (Karoo Flat Gecko)—Least Concern, *Afroedura tembulica* (Tembu Flat Gecko)—Least Concern, *Bitis inornata* (Plain Adder)—Endangered, *Anhydrophryne rattrayi* (Hogsback Chirping Frog)—Vulnerable, *Vandijkophrynus amatolicus* (Amatola Toad)—Critically Endangered, *Barbus amatolicus* (Amatola Barb)—Vulnerable, and *Barbus trevelyani* (Border Barb)—Endangered. The AWS also have an endangered endemic damselfly, Amatola Malachite (*Chlorolestes apricans*), associated with it (Tarboton & Tarboton 2005), thus further supporting the suggestion of Perera *et al.* (2011) to include the AWS into the newly defined Greater Maputoland-Pondoland-Albany (GMPA) region.

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