



A new species of dwarf chameleon (Sauria; Chamaeleonidae, *Bradypodion* Fitzinger) from KwaZulu Natal South Africa with notes on recent climatic shifts and their influence on speciation in the genus

COLIN R. TILBURY,^{1,2,4} & KRYSTAL A. TOLLEY³

¹P.O. Box 347, Nottingham Road, KwaZulu Natal

²Evolutionary Genomics Group, Dept of Botany and Zoology, University of Stellenbosch, Private Bag X1, Stellenbosch South Africa.
E-mail: sacolt@web.co.za

³Applied Biodiversity Research, Kirstenbosch Research Centre, South African National Biodiversity Institute, P/Bag X7, Claremont 7735, Cape Town, South Africa. E-mail: toley@sanbi.org

⁴Corresponding author

Abstract

A new species of dwarf chameleon is described from a restricted patch of relict indigenous forest in KwaZulu-Natal (KZN), South Africa. Its specific status is confirmed by phylogenetic analyses using molecular markers (1390 bp of mitochondrial 16S and ND2). The node defining this species is highly supported with both analyses (100% posterior probability, 100% bootstrap support). This species (*Bradypodion ngomeense* sp. nov.) is part of a larger clade of forest species, but is itself confined to a single forest (Ngome Forest). The molecular patterns of other forest restricted species in KZN were examined with a view to elucidate their patterns of distribution. It is postulated that these patterns may be the result of climatic shifts during the Pleistocene on the extent of forest cover which afforded multiple contact opportunities between coastal and montane forest elements with possible opportunities for gene flow between forests. At present, these patches are under threat from human activities such as forest resource extraction, sugar cane and pine plantations. Their small distributions and possibility for future habitat loss make these species of conservation concern. The taxonomic status of a recently described species *Bradypodion nkandlae* (Raw & Brothers 2008) is found to be conspecific with *B. nemorale* and is herewith synonymised.

Key words: Africa, conservation, afro-montane forest, scarp forest, Indian Ocean coast belt, reptiles, lizards, hotspots

Introduction

The varied climate and topography of KwaZulu-Natal province (KZN) supports a variety of biomes with several types of indigenous forest (Mucina & Rutherford 2006) including Indian Ocean coastal belt forest, Afro-montane forest, (including Mist Belt mixed *Podocarpus*) and coastal scarp forest (Mucina & Gehdenhuys 2006). KZN has a rich species diversity of chameleons, currently encompassing seven described species of *Bradypodion* and one *Chamaeleo*. Most of this diversity has only been recognized in the past few decades, with six new taxa in the genus *Bradypodion*, and many morphologically distinct populations of dwarf chameleons noted (Raw 1976, 1978, 1995, 2002, Raw & Brothers 2008). Raw (1995, 2002) proposed that some of these distinct populations fulfilled the criteria for species based on morphologic and colour differences. In the interim, it has been proposed that some of these populations may be variants or “eco-morphs” of polymorphic evolutionary lineages (Tolley *et al.* 2004, Tolley & Burger 2004), possibly representing the start of new species radiations that are presently at a stage where genetic evolution has lagged behind morphological differentiation (e.g. Tolley *et al.* 2006, 2008).

The lack of clear and consistent differences in external morphological characters which easily separate