



## A re-appraisal of the systematics of the African genus *Chamaeleo* (Reptilia: Chamaeleonidae)

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### Abstract

The genus *Chamaeleo*, currently subdivided into two sub-genera, *Chamaeleo (Chamaeleo)* and *Chamaeleo (Trioceros)* (Klaver & Böhme 1986), is reviewed from both a morphological and genetic basis and it is concluded that the two sub-genera are sufficiently distinct as to warrant their formal elevation to separate and distinct genera. Evaluation of the soft anatomy and several other characters provide sufficient basis for making this distinction. The proposed change is supported by the demonstration of monophyletic groupings (based on two mitochondrial and one nuclear gene) consistent with distinct genera.

**Key words:** *Chamaeleo*, *Trioceros*, Taxonomic review, Taxonomy, Reptilia

### Introduction

Klaver and Böhme (1986) in their landmark study on the comparative anatomy of the Chamaeleonidae, were guided by a detailed analysis of both hemipenial and lung morphology, supplemented by data where available on karyology and cranial structure. They elected to divide the family into six genera, one of which was further sub-divided into two sub-genera viz: *Chamaeleo (Chamaeleo)* and *Chamaeleo (Trioceros)*.

In the intervening years since then, apart from descriptions of the hemipenes of several new species of chameleons, no further work has been done on soft anatomy. The advent of phylogenetics as an adjunct to comparative anatomy has led to an increase in the appreciation of the complexity of evolutionary relationships and in turn has led to several recent taxonomic rearrangements of the African chameleons at the tertiary level (Matthee et al 2004, Tilbury et al 2006). Whilst the taxonomic landscape of the African pygmy chameleons and the enigmatic “*Bradypodion* group” (sensu lato) have been resolved, the genus *Chamaeleo* bears a re-look from a phylogenetic perspective due to the heterogeneous nature of its component sub-genera.

Recent work on the phylogenetics of the Chamaeleonidae cast doubt on the relationship between these two sub-genera at the genus level (Townsend and Larson 2002). In the current paper, the comparative anatomy of the genus *Chamaeleo* is reviewed and additional genetic evidence is presented that allow us to propose that there is no relationship between the two sub-genera of *Chamaeleo* beyond that at a level higher than currently thought.

**Hemipenial Morphology.** The importance of hemipenial morphology as a tool in primary and higher level systematics was demonstrated by Böhme (1988), Böhme & Klaver (1980) and Klaver & Böhme (1986). Several derived hemipenial morphologies have been described, but the plesiomorphic condition seen in members of five of the nine currently described genera consists of a basal pedicel, followed by a truncal stalk with or without truncal calyces. The stalk is topped by an apical section, adorned with a quadruple