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Phylogenetic relationships and classification of the Malagasy pseudoxyrhophiine snake genera *Geodipsas* and *Compsophis* based on morphological and molecular data

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Abstract

Based on a specimen found at Montagne d'Ambre in northern Madagascar morphologically agreeing with *Compsophis albiventris* Mocquard, 1894, we report on the rediscovery of this enigmatic snake genus and species and its molecular phylogenetic relationships. *Compsophis albiventris*, considered to be the only representative of its genus and unreported since its original description, bears strong morphological similarities to species of *Geodipsas* Boulenger, 1896. A molecular phylogeny based on DNA sequences of three mitochondrial and nuclear genes (complete cytochrome *b*, fragments of 16S rRNA and c-mos) in *Compsophis albiventris* and three *Geodipsas* species corroborated close relationships between *C. albiventris* and *Geodipsas boulengeri*, and showed that the genera *Compsophis* and *Geodipsas* together form a monophyletic unit. Despite the general similarities, morphological data and chromatic features support the existence of two species groups, corresponding to *Compsophis* and *Geodipsas*. We consequently consider *Geodipsas* as a subgenus of *Compsophis* and transfer all species currently in *Geodipsas* into the genus *Compsophis*.

Key words: Squamata, Serpentes, Lamprophiidae, Pseudoxyrhophiinae; *Compsophis*; *Geodipsas* syn. nov.; *Compsophis albiventris*; *Compsophis boulengeri* comb. nov.; *Compsophis fatsibe* comb. nov.; *Compsophis infralineatus* comb. nov.; *Compsophis laphystius* comb. nov.; *Compsophis vinckei* comb. nov.; *Compsophis zeny* comb. nov.

Introduction

The caenophidian snakes of Madagascar, except the psammophiine genus *Mimophis*, belong to a large radiation considered as subfamily Pseudoxyrhophiinae which also contains the Socotran endemic genus *Ditypophis* as most basal lineage (Nagy *et al.* 2003), and possibly also the southern African slug eaters, genus *Duberria*, in a phylogenetically nested position (Lawson *et al.* 2005). Pseudoxyrhophiines have classically been included in the family Colubridae which has recently been demonstrated to be paraphyletic, and thus its taxa have been rearranged over various families (e.g., Lawson *et al.* 2005; Vidal *et al.* 2007). We here follow the proposal of Vidal *et al.* (2007) to include the Pseudoxyrhophiinae in a family Lamprophiidae which is phylogenetically sister to the Elapidae, but it seems clear that further changes will be necessary in caenophidian family-level classification as results from more and more comprehensive datasets keep becoming available. Taxonomy of pseudoxyrhophiines has been summarized by Cadle (2003), and three new species have been described since then (Glaw *et al.* 2005a, b; Mercurio & Andreone 2005). Malagasy pseudoxyrhophiines currently contain 17 genera and ca. 72 species, although additional species have already been identified and are currently awaiting description.

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