



<http://dx.doi.org/10.11646/zootaxa.3750.5.3>

<http://zoobank.org/urn:lsid:zoobank.org:pub:DC8E9834-EBFE-41EC-91D1-69EE0ED2DDF5>

A molecular phylogeny of the African plated lizards, genus *Gerrhosaurus* Wiegmann, 1828 (Squamata: Gerrhosauridae), with the description of two new genera

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Abstract

We constructed a molecular phylogeny of the African plated lizard family Gerrhosauridae using two mitochondrial markers (ND2, 732 bp; 16S, 576 bp) and one nuclear marker (PRLR, 538 bp). This analysis showed that the subfamily Gerrhosaurinae consists of five major clades which we interpret as representing five genera. The genera *Tetradactylus* and *Cordylus* were each recovered as monophyletic, but *Gerrhosaurus* as currently conceived is paraphyletic, consisting of three distinct genus-level assemblages. The two clades consisting of *Gerrhosaurus major* Duméril, 1851 and *Gerrhosaurus validus* Smith, 1849 are both described here as new genera, namely *Broadleysaurus* Bates & Tolley **gen. nov.** and *Matobosaurus* Bates & Tolley **gen. nov.**, respectively. Two subspecies of ‘*Gerrhosaurus major*’ that were historically separated on the basis of differences in colour pattern are not reciprocally monophyletic, so *Gerrhosaurus bottegoi* Del Prato, 1895 is relegated to the synonymy of *Broadleysaurus major* (Duméril, 1851) **comb. nov.**, which is rendered monotypic. *Gerrhosaurus validus maltzahni* De Grys, 1938 is genetically and morphologically well differentiated from *G. v. validus* and the two taxa also occur in allopatry. We therefore re-instate the former as *Matobosaurus maltzahni* (De Grys, 1938) **comb. nov.**, rendering *Matobosaurus validus* (Smith, 1849) **comb. nov.** a monotypic species. Our analysis also showed that *Gerrhosaurus* sensu stricto comprises two major subclades, one consisting of *Gerrhosaurus typicus* (Smith, 1837) + *Gerrhosaurus skoogi* Andersson, 1916, and the other containing the remaining species. In this latter subclade we show that west-Central African *Gerrhosaurus nigrolineatus* Hallowell, 1857 is most closely related to *Gerrhosaurus auritus* Boettger, 1887 rather than to *G. nigrolineatus* from East and Southern Africa. The west-Central African clade of *G. nigrolineatus* differs from the East and Southern African clade by a *p*-distance of 13.0% (ND2) and 6.9% (16S), and can be differentiated morphologically. We accordingly apply the name *Gerrhosaurus intermedius* Lönnberg, 1907 **comb. nov.** to populations from Kenya, Uganda, Rwanda, Tanzania, Malawi, Mozambique, Zimbabwe and South Africa previously identified under the name *G. nigrolineatus*. Our analysis also confirms that *Gerrhosaurus bulsi* Laurent, 1954 is a distinct species and sister taxon to a clade containing *G. nigrolineatus*, *G. auritus* and *G. intermedius*. The latter four taxa form a closely-related ‘*G. nigrolineatus* species complex’ with a widespread distribution in Africa. Most closely related to this complex of species is *Gerrhosaurus flavigularis* Wiegmann, 1828 which has an extensive range in East and Southern Africa, and displays genetic substructure which requires further investigation. The status of *Gerrhosaurus multilineatus* Bocage, 1866, and Angolan populations referred to *G. nigrolineatus*, remains problematic.

Key words: Sauria, Cordyliformes, Gerrhosaurinae, systematics, taxonomy, phylogeography

Introduction

The lizard families Gerrhosauridae and Cordylidae together constitute the clade Cordyliformes (Lang 1991). There exists a long history of disagreement among authors as to whether this clade comprises a single family, the

Western Cape (South Africa) northwards through southern and eastern Africa to Ethiopia (Loveridge 1942). Although not sampled for this study, should the apparently disjunct population in the Western and Eastern Cape Provinces be found to represent a unique lineage, the name *G. flavigularis* would be applicable to it. If the other population in southern and East Africa proves to be a separate species, the name *Gerrhosaurus bibroni* Smith, 1844 is available.

Acknowledgements

We thank the following individuals: Marius Burger (and the Southern African Reptile Conservation Assessment project), Werner Conradie, Edward Stanley and John Measey for collecting specimens or tissue samples used in this study; Don Broadley for drawing our attention to the existence of the two topotypes of *Gerrhosaurus multilineatus* in the Natural History Museum (London); Patrick Campbell at the latter museum for providing photographs of these specimens; Ned Gilmore at the Academy of Natural Sciences (Philadelphia) for providing photographs of the two syntypes of *G. nigrolineatus*; Lauretta Mahlangu for recording morphological data for a specimen of *G. intermedius* (TM 80959) in the Ditsong National Museum of Natural History (Pretoria); Marius Burger for photographs published in this paper, as well as additional images of *G. nigrolineatus* from Kouilou region, Republic of the Congo; Warren Schmidt, Wulf Haacke, James Harvey and Atherton de Villiers for photographs used in this paper; and Klaus Adolphs and Aaron Bauer for supplying copies of old literature. GERDIB (Groupe d'Etude et de Recherche sur la Diversité Biologique) in Brazzaville is thanked for supplying collecting permits for Republic of the Congo. This work was funded by the National Research Foundation of South Africa (South African Biosystematics Initiative Grant Number 65778).

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APPENDIX I. List of *Gerrhosaurus nigrolineatus* and *G. intermedius* specimens examined for morphological characters.

Gerrhosaurus nigrolineatus

GABON: Ogooué-Maritime Province—Loango National Park: PEM R5405 & R5437 (02°20'27"S, 09°35'33"E, O.S.G. Pauwels & W.R. Branch, 8 and 2 Oct 2002 respectively), PEM R5411 (02°19'56"S, 09°35'32"E, O.S.G. Pauwels & W.R. Branch, 11 Oct 2002), PEM R5435 (no co-ordinates available, O.S.G. Pauwels & W.R. Branch, 15 Oct 2002), PEM R5965 (02°20'27"S, 09°35'50"E, O.S.G. Pauwels & W.R. Branch, 10 Oct 2002); East of Gamba on road to Vera: PEM R5208 & MB 05848 (02°45'31"S, 10°08'13"E, M. Burger, 11 Jul 2001), PEM R5209 (02°44'41"S, 10°08'28"E, M. Burger, 11 Jul 2001); Rabi, Shell Gabon: PEM R5322 (01°52'58"S, 09°50'26"E, J.A. Yoger & O.S.G. Pauwels, 10 Mar 2002). REPUBLIC OF THE CONGO: Kouilou Department [region]—5.5 km west of Tchizondi: PEM R20066 (04°22'47.4"S, 11°36'17.2"E, M. Burger & A.G. Zassi-Boulou, 12 May 2012); Koutou base camp for Sintoukola Potash: PEM R20067 (04°07'38.3"S, 11°41'37.0"E, M. Burger & A.G. Zassi-Boulou, 16 Jul 2012).