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Article

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Interrelationships and history of the slit-eared skinks (*Gongylomorphus*, Scincidae) of the Mascarene islands, based on mitochondrial DNA and nuclear gene sequences

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Abstract

The scincid lizard genus *Gongylomorphus* is endemic to the western Mascarene islands of Mauritius and Réunion in the southwest Indian Ocean, where its range was greatly reduced in the Nineteenth century, probably by an introduced southern Asian wolf snake (*Lycodon aulicus capucinus*) and perhaps other exotics. A phylogenetic analysis of the single recognised species of *Gongylomorphus* was conducted using 1473 bp of combined recent mtDNA and nuclear sequence (cytochrome *b* 714 bp, 12SrRNA 388 bp, c-*mos* 371 bp) from 40 individual *Gongylomorphus* and members of 13 scincid genera used as outgroups. The three recognised subspecies form monophyletic lineages that diverge by 7% for mtDNA and 0.8% for c-*mos* and, as they also differ in morphology, they are raised to species status here. *G. fontenayi* occurs in relict montane forest in southwest Mauritius and on neighbouring Flat Island; *G. bojerii* on this and other offshore islands north and southeast of Mauritius; and the sister of this last species, *G. borbonicus* was found on Réunion where it became extinct by about 1840. Phylogenetic topology suggests the ancestor of *Gongylomorphus* originated in Madagascar or possibly Africa, colonising Mauritius from the west and speciating there as long as 3Ma, before a propagule from the *G. bojerii* lineage invaded Réunion < 2.1Ma to produce *G. borbonicus*. On and around Mauritius, moderate mtDNA variation exists within and between populations. Extant *G. bojerii* have two main haplogroups differing by ~ 1.7%: one on the northern offshore islands (Gunners Quoin, Flat, Gabriel, Round and Serpent islands, and Pigeon House Rock) and the other in the southeast (Ilot Vacoas). But homologous sequence from a recently extinct population on Ile aux Fouquets and subfossil bones from at least one mainland site indicates that members of both haplogroups originally occurred together in the southeast. Although the *G. bojerii* population on Serpent Island is morphologically distinct, it is genetically undifferentiated from neighbouring populations. In *G. fontenayi*, a more robust orange-tailed population occurs on Flat Island over 60 km away from the remaining ones in the southwestern mountains of Mauritius but diverges from these by only 1.7% in mtDNA sequence. Subfossil material in the intervening area appears to represent intermediate haplotypes and confirms original continuity. These examples show that relict and limited material can mislead about the distinctness of allopatric populations.

Key words: *Gongylomorphus*, Mascarenes, 12SrRNA, cytochrome b, c-*mos*

Introduction

Gongylomorphus is a distinctive genus of small skinks (Scincidae) that is confined to the western Mascarene islands in the southwest Indian Ocean, namely Réunion and Mauritius and its off-shore islets (Fig. 1A). It has not been reported from the third, more eastern island of Rodrigues and is not present in extensive recent fossil lizard material collected on that island (EN Arnold, CG Jones, JJ Austin unpublished data). The members of *Gongylomorphus* are characterised by a number of peculiar features that are absent or at least very rare in

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