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Systematics of the *Carlia 'fusca'* complex (Reptilia: Scincidae) from northern Australia

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Abstract

Using a combination of mitochondrial and nuclear genetic markers, karyotypes and morphology, we examine the taxonomy of the Australo-papuan scincid lizard *Carlia 'fusca'* complex in northern Australia, all of which had been assigned previously to *C. longipes*. *Carlia longipes*, shows substantial variation in Y chromosome morphology between populations, indeed more than is seen between other species of *Carlia*. Analyses of the molecular genetic data and morphology demonstrate that populations with different Y chromosomes are two different species and also lead to the recognition of a third species from the Torres Strait. We herein define each of these species, for which previously described names can be applied.

Key words: Lizard, Scincidae, *Carlia*, morphology, mitochondrial DNA, chromosome, allozyme, taxonomy

Introduction

Rainbow skinks, *Carlia* Gray, 1845, are found throughout eastern and northern Australia and New Guinea and its associated islands and some of the Lesser Sunda islands. With recent taxonomic revisions of the Australian (Ingram & Covacevich 1989) and New Guinean (Zug 2004) components of *Carlia*, some recent additions (Zug and Allison 2006) and generic level systematic revisions (Ingram and Covacevich 1988, Kraus 2007, Dolman and Hugall 2008), *Carlia* now comprises some 38 species, with some species formerly included in *Carlia* now placed in *Lygisaurus* de Vis, 1884 (13 species) and *Liburnascincus* Wells and Wellington, 1984 (3 species).

Amongst skinks from the Australian region, *Carlia* are well known for their well-marked patterns and, in particular, sexual dichromatism (Greer 1975). Most species of *Carlia* can at least be distinguished by their pattern and the colour of breeding males. Recent molecular genetic analyses of mitochondrial DNA sequence diversity of these skinks and the related genera, *Liburnascincus*, *Lygisaurus*, and *Saproscincus* (Stuart-Fox *et al*. 2002, Mousalli *et al*. 2005, Dolman and Hugall 2008), show that most species are also separated by sequence divergences of 10% or more. However, closely related species in this assemblage often show few and minor scalation differences (Couper *et al*. 2005). Consequently taxonomic allocation of older types that have faded in preservation can be contentious. Such an issue arises in the recent taxonomic dissection of the '*C. fusca'* group in New Guinea (Zug 2004).

Recent history of taxonomy of 'Carlia fusca' *complex*

Ingram and Covacevich (1989) revised the Australian members of the '*C. fusca*' group and, in doing so, made a preliminary examination of New Guinean specimens. They concluded that Australian *C. fusca* and 'the

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