Zootaxa 3499: 1–26 (2012)
www.mapress.com/zootaxa/

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

Article

urn:lsid:zoobank.org:pub:1BCED900-D6D4-42B8-99F1-A851C5EB72A9

A new species of *Crinia* (Anura: Myobatrachidae) from the Flinders Ranges, South Australia

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Abstract

We describe, as a new species, the northern Flinders Ranges populations of the myobatrachid frog *Crinia riparia*. It is distinguished from *C. riparia sensu stricto* on the basis of reciprocal monophyly of mitochondrial genes, absence of haplotype sharing in a nuclear gene, fixed differences in allozyme loci and differences in larval oral disc morphology consistent with less adaptation to stream habitats. We were not able to reliably distinguish the taxa on the basis of adult morphology. The geographic range of *C. riparia sensu stricto* is now reduced to a 75 kilometre section of the southern Flinders Ranges from Napperby Gorge in the south to Mt Brown in the north suggesting that an assessment of its conservation status is warranted.

Key words: frog, *Crinia*, conservation, larva, tadpole, mitochondrial DNA, taxonomy

Introduction

The Australian myobatrachid frog genus *Crinia* Tschudi 1838 currently comprises 16 species of small, ground-dwelling frogs including *C. nimba* (*Bryobatrachus nimbus*) Rounsevell *et al.* 1994 (see Read *et al.* 2001), which are distributed widely across the continent and extra-limitally in southern New Guinea. Most of the species level diversity in *Crinia* is found in the south-eastern (six species) and south-western (five species) mesic corners of the continent. In the arid zone, *Crinia* is represented by two taxa, *C. deserticola* (Liem & Ingram 1977) a widespread species in north-eastern Australia and by *C. riparia* Littlejohn and Martin 1965 confined to streams in the Flinders Ranges of south central Australia. The streambank froglet, *C. riparia*, appears to be the sister lineage to the widespread south-eastern mesic species *C. signifera* Girard 1853 (Read *et al*. 2001). Their ranges partly overlap in the southern Flinders Ranges where *C. riparia* is found in swift-flowing creeks with rocky substrates and little vegetation while *C. signifera* is found in slow-flowing creeks that are heavily vegetated, with mud or sand substrates (Odendaal & Bull 1982). *Crinia riparia* shows adaptations for life in swift-flowing streams (Littlejohn & Martin 1965). Specifically it attaches its strongly adherent eggs to the undersurface of rocks in streams and the free-living exotrophic larva has a stream-adapted depressed body shape with a large, broad oral disc for improved adherence to rocks (Altig & Johnston 1989).

Three main lines of evidence suggest that *C. riparia* may be composite. First, Symula *et al.* (2008) found two divergent mitochondrial clades within *C. riparia* with an approximate age of divergence of 12MYA estimated from molecular clock analysis. Second, Odendaal *et al*. (1983) found two groups that had fixed allelic differences at 19% of the 26 loci genotyped with multi-locus allozyme electrophoresis and both differed from *C. signifera* at 65% of the 26 loci genotyped. Third, a preliminary comparison of larval morphology from the northern and southern Flinders Ranges in 2004 (Anstis unpubl. data) indicated consistent differences in both larval body form and oral disc features. Although each study included animals from just a small number of localities, all three datasets were concordant in suggesting the presence of two genetically divergent groups that replace each other between Warren Gorge to the north-east of Quorn and Mambray Creek/Melrose to the south of Quorn.

Accepted by M. Vences: 27 Aug. 2012; published: 27 Sept. 2012