



## Two new frog species (Microhylidae: *Cophixalus*) from boulder habitats on Cape York Peninsula, north-east Australia

CONRAD J. HOSKIN<sup>1,2,4</sup> & KIERAN ALAND<sup>3</sup>

<sup>1</sup>Division of Evolution, Ecology & Genetics, Research School of Biology, The Australian National University, Canberra ACT 0200, Australia

<sup>2</sup>New address: School of Marine & Tropical Biology, James Cook University, Townsville, Queensland 4811, Australia

<sup>3</sup>Queensland Museum, PO Box 3300, South Bank, Brisbane, Queensland 4101, Australia. E-mail: kieran.aland@qm.qld.gov.au

<sup>4</sup>Corresponding author. E-mail: conrad.hoskin@gmail.com

### Abstract

Australia has a highly localised but diverse radiation of microhylid frogs. 18 species are described from north-east Queensland (14 *Cophixalus* and 4 *Austrochaperina*), most with highly localised montane distributions. While most species are small (10–25 mm) rainforest species, two differ dramatically in ecology and morphology. *Cophixalus saxatilis* and *C. zweifeli* inhabit isolated areas of jumbled boulder-pile habitat and are considerably larger than all other species (30–45 mm). Here we describe two new species of large, boulder dwelling *Cophixalus* from the Pascoe River region of Cape York Peninsula. *Cophixalus kulakula* **sp. nov.** occurs in piled boulder habitat amongst rainforest in the Tozer Range area, while *Cophixalus pakayakulangun* **sp. nov.** occurs in similar habitat in the Kennedy Hills region north of the Pascoe River. These are the most northerly sites for *Cophixalus* in Australia and both occur in rainforest areas not occupied by other species of *Cophixalus*. Both species are large (snout-vent length > 40 mm) and of similar morphology to the other two boulder-dwelling species. *Cophixalus kulakula* **sp. nov.** and *C. pakayakulangun* **sp. nov.** differ from each other and from all other described *Cophixalus* genetically and in aspects of colour pattern and morphology. The call of *C. kulakula* **sp. nov.** is also unique, but the call of *C. pakayakulangun* **sp. nov.** remains unknown. The two new species are each others closest relatives (albeit with approximately 8% genetic divergence for 12S and 16S mtDNA) and are allied to *C. ornatus*. The diet of both species consists primarily of ants. Both species have highly localised distributions but are abundant within these and are probably secure.

**Key words:** *Cophixalus kulakula*, *Cophixalus pakayakulangun*, boulder, granite

### Introduction

Two genera of frogs of the family Microhylidae are found in Australia, *Cophixalus* Boettger, 1892 (14 species) and *Austrochaperina* Fry, 1912 (5 species) (Zweifel 1985, 2000; Hoskin 2004). All but one of these species are restricted to north-east Queensland, and most have very small distributions (Hoskin 2004). The remaining species, *Austrochaperina adelphe* (Zweifel 1985), is restricted to the far north of the Northern Territory (Zweifel 1985, 2000; Hoskin 2004). Only one Australian microhylid species is shared with the diverse microhylid radiation of New Guinea — *Austrochaperina gracilipes* Fry, 1912, which occurs on northern Cape York and southern New Guinea and is unusual amongst Australian microhylids in occurring primarily in open forest and savanna habitats (Zweifel 1985). Most Australian microhylid species are restricted to rainforest. The majority of the species occur in montane rainforests of the Wet Tropics region, where they account for approximately 50% of the rainforest frog diversity (Hoskin 2004; Hoskin & Hero 2008). The rainforest species generally occupy leaf-litter, ground debris and low vegetation, and are of small body size (SVL 10–30 mm) (Zweifel 1985; Hoskin 2004, 2008).

Two species (*C. saxatilis* Zweifel & Parker, 1977 and *C. zweifeli* Davies & McDonald, 1998, Fig. 1) differ obviously in ecology and morphology, being found in boulder-pile habitat with little or no vegetation and being larger (SVL 30–47 mm). *Cophixalus saxatilis* is found in granite boulder piles of the Black Trevethan Range