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A new species of the blind cave gudgeon *Milyeringa* (Pisces: Gobioidi, Eleotridae) from Barrow Island, Western Australia, with a redescription of *M. veritas* Whitley

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Abstract

A new species of the eyeless eleotrid genus *Milyeringa* is described from wells sunk on Barrow Island, Western Australia. *Milyeringa justitia* n. sp. is the third species of the genus to be named. Morphological data and cytochrome *c* oxidase subunit I (COI) DNA sequence data from a wide sample of localities at which the genus occurs was used to evaluate relationships and species limits. *Milyeringa veritas* is redescribed, and *M. brooksi* is synonymised with *M. veritas*. The unique form and ecology of these fishes, plus the threats to their survival, warrants immediate and continuing attention in management.

Key words: Eleotridae, *Milyeringa*, new species, caves, stygofauna, Western Australia

Introduction

The cave gudgeon, *Milyeringa veritas* Whitley, 1945, has been known as the only cave-dwelling gobioid in Australia. It had been reported only from anchialine caves and wells at the base of and foothills of the Cape Range peninsula, Western Australia and from Barrow Island, some 180 km distant (Adams & Humphreys 1993; Humphreys 2001a; Chakrabarty 2010) (Figs 1, 2). Whitley (1945) was so impressed by the species' eyelessness and reduced dorsal and ventral fins that he placed it in its own family, Milyeringidae, which was subsequently synonymised with the Eleotridae by Mees (1962). Later, Hoese and Gill (1993) placed *Milyeringa* in the eleotrid subfamily Butinae. Thacker and Hardman (2005) placed *Milyeringa* in the Odontobutidae based on an analysis of four mitochondrial genes, as did Thacker (2009), using the same four genes plus additional taxa. However, in the latter study *Milyeringa* flipped into a polytomy with *Rhyacichthys* and the odontobutids *Odontobutis* and *Perccottus* (Thacker 2009: Fig. 1). In contrast, Mooi and Gill (2008), using 55 morphological characters, presented a consensus tree (of six equally parsimonious trees) in which *Milyeringa* forms a polytomy with the butine *Hannoichthys* and the rest of the gobioids above the odontobutids and rhyacichthyids.

Chakrabarty (2010) recommended retaining the family name Milyeringidae for *Milyeringa* "... to highlight its distinct position within the Gobiiformes and for its extreme ecological specializations". Most recently, *Milyeringa* has been presented as sister-group to the Eleotridae in a clade with *Typhleotris*, the very similar blind cave gudgeon from Madagascar (Chakrabarty *et al.* 2012). None of the analyses to date have included sequence data from nuclear genes. Clearly there remains considerable work to be carried out on gobioid relationships and to reconcile the differing morphological and molecular analyses and approaches (see Mooi & Gill 2010). We have retained *Milyeringa* in Eleotridae until further evidence is acquired.