



## Status and phylogeny of Milyeringidae (Teleostei: Gobiiformes), with the description of a new blind cave-fish from Australia, *Milyeringa brooksi*, n. sp.

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### Abstract

A phylogeny of Milyeringidae is reported and a new species, *Milyeringa brooksi*, is described from Cape Range National Park in the North West Cape (Cape Range Peninsula) of Australia. This species is distinguished on the basis of morphological and molecular characters from its only congener *Milyeringa veritas*. These diagnostic characters are related to a unique pattern of sensory papillae on the body and synapomorphies in three genes (cytochrome c oxidase I, cytochrome b, and NADH dehydrogenase 2). The new species is known only from the southern portion of the North West Cape spanning roughly 50 kilometers of subterranean habitat. This habitat is exceedingly rare and measures to preserve it and its fauna should be taken.

**Key words:** blind, cave, stygobites, taxonomy, troglodytic

### Introduction

Whitley (1945) erected Milyeringidae, to contain the monotypic genus *Milyeringa*. He noted that the only morphological feature separating this family from the Eleotridae was the lack of eyes and this feature was the main diagnostic characteristic distinguishing it from other Gobioidae. He conjectured that *Milyeringa* had a close phylogenetic association with *Carassiops* (= *Hypseleotris*) and *Typhleotris* with the caveat that, “the interesting implications of this new form must await fuller elaboration later when I can refer to more literature than is available to me here in Western Australia.” Unfortunately, the comparative data was lacking until recently.

The lone member of the monotypic family, *Milyeringa veritas* Whitley 1945, was described from Milyering Well on the North West Cape of Western Australia. *Milyeringa veritas* was described without many details about habitat and ecology; these details were produced much later by the meticulous studies of Humphreys and colleagues (2001, 2006; among others). At the time of its description, *M. veritas* was only known from the type locality. Humphreys and colleagues have subsequently observed this taxon from over two dozen sites throughout the North West Cape and adjacent Barrow Island (Humphreys, 2001). Adams and Humphreys (1993) conducted a population level study of *M. veritas* using allozymes and found significant population level structure among the fishes collected from these sites and hypothesized that some populations may represent undescribed species. Collections made by Darren Brooks and the author in May of 2009 confirm that members of the southern most range of *Milyeringa* constitute a new species that is described herein.

### Materials and Methods

Specimens included in comparative analyses are listed in the species description and Materials Examined. Institutional abbreviations are as follows: LSUMZ (Louisiana State University Museum of Zoology, Baton Rouge), SAM (South Australia Museum, Adelaide); WAM (Western Australia Museum, Perth).