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A review of *Galaxiella pusilla* (Mack) (Teleostei: Galaxiidae) in south-eastern Australia with a description of a new species

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Abstract

The dwarf galaxias, *Galaxiella pusilla* (Mack), is a small, threatened freshwater fish from coastal south-eastern Australia. Recent genetic studies, using multiple nuclear and mitochondrial DNA markers, found substantial differences between populations in western Victoria and south Australia ('west region') compared to eastern Victoria, Flinders Island, and Tasmania ('east region') that suggest the presence of a cryptic species. Morphological measurements and meristic counts from multiple populations within each region were undertaken to investigate potential differences between regions. Several characters, found to discriminate between individuals in the regions and to be diagnostic for two taxa, were used to describe a new species, *Galaxiella toourtkoourt*, for the west region. This is only the second species in the Galaxiidae to exhibit sexual dimorphism. The original description of *Galaxiella pusilla*, based on five specimens, is revised following examination of a large number of individuals. Both species are considered nationally threatened and are categorised as 'endangered'; the revised distribution of *G. pusilla* s.s. is reduced by approximately 60%. A number of inconsistencies in the most recent revision of the genus *Galaxiella* are also corrected.

Key words: taxonomic revision, dwarf galaxias, sexual dimorphism, threatened species, freshwater fish, cryptic species

Introduction

Within the Southern Hemisphere temperate family Galaxiidae, the genus *Galaxiella* currently includes three small, freshwater dependent species, namely: *Galaxiella pusilla* (Mack, 1936), *Galaxiella nigrostriata* (Shipway, 1953) and *Galaxiella munda* McDowall, 1978. The geographic distribution of *G. pusilla* is restricted to coastal south-eastern Australia, including Tasmania, while *G. nigrostriata* and *G. munda* are restricted to coastal south-western Australia. *Galaxiella* are distinguished from the other genera of Australian galaxiids by: a) their small maximum size, b) dorsal fin origin distinctly behind the anal fin origin, c) strongly developed caudal peduncle flanges with few procurrent rays, d) lack of laterosensory pores beneath the lower jaw, e) less than 16 principal caudal rays (usually 13–14), f) a rounded caudal fin, g) slender, non-flattened, spike-like caudal neural and haemal spines, and h) 3–4 branchiostegals (McDowall 1978a; McDowall & Frankenberg 1981). Another diagnostic feature of *Galaxiella* is the presence of horizontal stripes along the sides of the body, with juveniles having a crenulated stripe along the lower sides that only persists in adult *G. munda* (McDowall 1978a).

Genetic and morphological studies suggest that the Australian *Galaxiella* are closely related to the South American *Brachygalaxias*—sharing an ancient Gondwanan ancestry (Waters *et al.* 2000; McDowall & Waters 2004). In addition to their comparatively small size, *Brachygalaxias* and *Galaxiella* are unique within the Galaxiidae for their longitudinal body stripes (including bright yellow to orange-red), and fleshy ventral keel which may play a role in targeted egg placement during mating (McDowall & Waters 2004). Waters *et al.* (2000) estimated the time of separation between *Galaxiella* and *Brachygalaxias* lineages to be around 8.6–30.0 Ma,