



## A partial revision of the *Philarius gerlachei* (Nobili, 1905) species complex (Crustacea, Decapoda, Palaemonidae), with description of four new species

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### Summary

The pontoniine shrimp *Philarius gerlachei* (Nobili, 1905) is revised based on Nobili's type material from the Persian Gulf and specimens recently collected in Madagascar, Australia and French Polynesia. *Philarius gerlachei* is redescribed and four species are described as new: *P. polynescicus* n. sp. from Moorea, French Polynesia; *P. rufus* n. sp. and *P. minor* n. sp., both from Heron Island, Great Barrier Reef, Australia, and *P. albimaculatus* n. sp. from Nosy-Bé, Madagascar. These species differ from *P. gerlachei* and/or from each other by a combination of morphological characters and species-diagnostic colour patterns. All species of *Philarius* appear to be obligate associates of branching corals of the genus *Acropora*.

**Key words:** Caridea, Palaemonidae, Pontoniinae, shrimp, *Philarius*, new species, Indo-West Pacific, *Acropora*, symbiosis

### Introduction

The pontoniine shrimp genus *Philarius* Holthuis, 1952 presently includes three species: *P. lifuensis* (Borradaile, 1898), *P. gerlachei* (Nobili, 1905), and *P. imperialis* (Kubo, 1940) (Bruce, 1994; De Grave *et al.* 2009). In addition, *Periclimenes brevinaris* Nobili, 1906 was referred to *Philarius* by Bruce (1967), but later treated as *incertae sedis* (see Bruce 1994), although it is still listed under *Philarius* in Li's (2000) catalogue of pontoniine shrimps.

*Philarius lifuensis* is distinguishable from its congeners by the presence of distinct supraorbital teeth (Bruce 1982), whereas *P. imperialis* is the only species of the genus bearing a strong tooth on the carpus of the second pereopods (Kubo 1940; Bruce 1982). All specimens lacking these two features were previously assigned to *P. gerlachei*, the type species of *Philarius*, originally described from the Persian Gulf (Nobili 1905). *Philarius gerlachei* also appears to be the most widespread species in the genus, based on numerous records from throughout the Indo-West Pacific (e.g., Bruce, 1982; Li, 2000). All species of *Philarius* are obligate symbionts of acroporid corals, specifically species of the genus *Acropora* Oken (Bruce, 1982; Bruce & Coombes, 1995; Li 2000).

Recently, several specimens of *Philarius* were collected during large-scale surveys of marine decapod crustaceans at three distant localities in the Indo-West Pacific, viz. Nosy-Bé, Madagascar, in 2008 (Biotas), Moorea, Society Islands, French Polynesia, in 2008 (Biocode Moorea), and Heron Island, Great Barrier Reef, Australia, in 2009 (CReefs). All these specimens are referable to *P. gerlachei* using the key provided by Bruce (1982). However, differences in colour patterns and morphology observed among the specimens from Nosy-Bé, Moorea and Heron Island demanded a more thorough study of this material. This study revealed the presence of four species in our material, one in Nosy-Bé, one in Moorea, and two in Heron Island, distinguishable by subtle characters on the rostrum-orbital region and pereopods, as well as colour patterns. We then examined Nobili's syntypes of *P. gerlachei* from the Persian Gulf, deposited in the collections of the Muséum national d'Histoire naturelle, Paris, France (MNHN), and compared them with the specimens from Nosy-Bé, Moorea, and Heron Island. We found a number of subtle morphological differences between these specimens and *P. gerlachei*. Therefore, *P. gerlachei* is redescribed and refigured below based on Nobili's syntypes from the Persian Gulf, to fix its taxonomic identity. The remaining four species, one from Nosy-Bé, one from Moorea, and two from Heron Island, are described as new in this study. A key to all presently known species of *Philarius* is provided.