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More species of the *Agononida incerta* complex revealed by molecules and morphology (Crustacea: Decapoda: Anomura: Munididae)

GARY C. B. POORE[1] & NIKOS ANDREAKIS[2]

[1]*Museum Victoria, GPO Box 666, Melbourne, Vic. 3000, Australia (gpoore@museum.vic.gov.au)*
[2]*Australian Institute of Marine Science, PMB No. 3, Townsville, QLD, 4810, Australia (n.andreakis@aims.gov.au)*

Abstract

Squat lobsters from Madagascar, Vanuatu, Papua New Guinea, Fiji, eastern Australia and French Polynesia belonging to the *Agononida incerta* (Henderson, 1888) species complex are described as four new species: *A. madagascerta*, *A. polycerta*, *A. tasmancerta* and *A. vanuacerta*. This brings to ten the number of species in this complex. All species are morphologically distinguishable only on the basis of the shape of the anterolateral margin of the telson and setation of the dactyli of pereopods 2–4. The morphological delineation of nine of the species and their taxonomic status are robustly supported by phylogenetic analysis of the partial 16S rDNA gene and the partial mitochondrial cytochrome oxidase subunit 1 genes, and in some cases by colour. A phylogenetic analysis of the nine species for which molecular data are available grouped the species in two clades, one of four species with facial spines on the upper surface of pereopod 4 and the other of five species lacking facial spines.

Key words: Crustacea, Anomura, *Agononida*, new species, Indo-West Pacific, mitochondrial genes

Introduction

The squat lobster species, *Agononida incerta* (Henderson, 1888), was widely reported throughout the Indo-West Pacific until Macpherson & Baba (2009) differentiated a second species and we showed that another four species masqueraded under this name (Poore & Andreakis 2012). Both these studies used molecular and morphological data and colour variations in support of the species' delineation. Cryptic speciation is frequent in squat lobsters. Similar recent surveys have revealed hidden diversity or species complexes in other genera: *Paramunida* (Cabezas *et al.* 2010), *Allogalathea elegans* (Cabezas *et al.* 2011), *Uroptychus naso* (Poore & Andreakis 2011), and *Eumunida* (Puillandre *et al.* 2011), suggesting that the family's global diversity is underestimated.

Agononida Baba & de Saint Laurent, 1996 is one of 20 genera of the squat lobster family Munididae Ahyong, Baba, Macpherson & Poore, 2010. The genus was diagnosed most recently by Macpherson & Baba (2011); it contains 37 species of which *Munida incerta* is the type species (Macpherson 2013a). Poore & Andreakis (2012) characterised the *A. incerta* species group.

In our previous paper *Agononida incerta*, *A. rubrizonata* Mapherson & Baba, 2009 and four new species were diagnosed after re-examining type material and reviewing recent collections from Western Australia, Taiwan, the Philippines, the Norfolk Ridge and the Mozambique Channel. DNA analysis of mitochondrial and nuclear genes from representatives of new material from the Muséum national d'Histoire naturelle, Paris (MNHN) collected across the Indo-West Pacific from Madagascar to French Polynesia revealed the existence of three new clades that are described as new species in this paper. Additional material from eastern Australia, not suitable for molecular analysis, proved to belong to none of these and is described as a fourth new species. In light of these findings, some existing taxa are reviewed based on new material and an updated key to species is presented.

The MNHN provided specimens from the Mozambique Channel (2009 MAINBAZA expedition), Madagascar (2009 MIRIKY expedition), Indonesia (1991 KARUBAR expedition), Papua New Guinea (PNG) (2010 BIOPAPUA expedition), the Philippines (1980 MUSORSTOM 2 expedition), Vanuatu (1994 MUSORSTOM 8

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