A new viviparous species of asterinid (Echinodermata, Asteroidea, Asterinidae) and a new genus to accommodate the species of pan-tropical exiguoid sea stars

ALAN J. DARTNALL[1], MARIA BYRNE[2], JOHN COLLINS[3] & MICHAEL W HART[4]

[1] *17 Kepler St, Wulguru, Queensland 4811, Australia*
    email: ajdartnall@hotmail.com.au

[2] *Department of Anatomy & Histology, F-13, University of Sydney, Sydney, New South Wales 2006, Australia*
    email: mbyrne@anatomy.usyd.edu.au

[3] *Department of Marine Biology, James Cook University, Townsville, Queensland 4811, Australia*
    email:john.collins@jcu.edu.au

[4] *Department of Biology, Dalhousie University, Halifax, Nova Scotia, Canada*
    email:michael.hart@dal.ca

Abstract

This paper describes a new species of viviparous, intragonadal brooder of asterinid sea star and clarifies the identities of *Patiriella pseudoexigua* Dartnall 1971, the species *Patiriella pseudoexigua sensu* Chen and Chen (1992) and *Patiriella pseudoexigua pacifica* (Hayashi, 1977). The latter is raised to specific rank. Analysis of mitochondrial DNA supports the concept of a pan-tropical assemblage of species for which a new genus, *Cryptasterina*, is created. All species in *Cryptasterina* are morphologically similar and comprise species with planktonic, lecithotrophic, non-feeding larvae, and viviparous outlier species with limited distributions. The full diversity of this species diaspora remains to be resolved.

Key words: Echinodermata; Asteroidea; Asterinidae; *Cryptasterina* new genus; new species; new combination; cryptic species; developmental biology; viviparity; tropical

Introduction

The sea star family Asterinidae has two species-rich genera, *Asterina* and *Patiriella* (Rowe and Gates 1996). Based on molecular and morphological evidence, these genera are now considered to be paraphyletic (Hart et al. 1997). In comparison with other asteroids the Asterinidae appear particularly prone to rapid change in life history, a feature that has played a major role in species divergence (Dartnall 1969, 1971; Hart et al. 1997; Byrne et

---