

## The spatangoid echinoid *Schizaster (Schizaster) compactus* (Koehler, 1914) in Western Australia

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**Abstract** – The spatangoid echinoid *Schizaster (Schizaster) compactus* (Koehler, 1914) is recorded from Australian waters for the first time. A sample consisting of a juvenile and adults collected from off the Dampier Archipelago, Western Australia is shown to undergo significant ontogenetic variation in a number of parameters, notably number of pore pairs in all aboral ambulacra; relative size and shape of the peristome and periproct; relative width of ambulacrum III aborally; and relative length of the posterior petals. A number of morphological characters also show appreciable intraspecific variation, in particular the number of gonopores; position of the peristome; the width of the plastron; test width; and position of the apical system. An understanding of the degree of phenotypic variation in this species aids in the delimitation of species of *Schizaster* and in the characterisation of the taxa *Schizaster* and *Paraster*.

### INTRODUCTION

On July 27, 1982 a number of large steel pipes destined for the North-West Shelf Gas Project was inadvertently sunk in about 45 m of water north of Dampier, Western Australia at 20°19'33.1"S, 116°33'22.11"E. Nearly 10 months later, on May 18, 1983, the pipes were recovered. They were found to be packed with soft, foraminiferal-rich silt, within which were living five species of spatangoids. In addition to 33 complete and broken specimens of a species of *Schizaster*, single specimens of *Moira lethae* Mortensen, 1930; *Metalia sternalis* (Lamarck, 1816); and *Lovenia elongata* (Gray, 1845) were found in the silt, along with three specimens of an undescribed species of *Metalia*.

The species of *Schizaster* (Figure 1) is identical to a single specimen described by McNamara and Philip (1980a) from Rosemary Island in the Dampier Archipelago, and referred by them to *Schizaster (Schizaster) lacunosus* (Linnaeus, 1758). Examination of the larger population has revealed the species to be conspecific with a form described by Koehler (1914) from the Bay of Bengal and called by him *Paraster compactus*. However, in one character the Western Australian form differs from the features described by Koehler, and that is in the number of gonopores. Koehler's description was based on only two specimens. This difference is not considered to be of sufficient importance to warrant placing the Australian form in a separate species, as other species of *Schizaster* have been shown to possess variable numbers of gonopores (McNamara and Philip 1980a).

In addition to describing this species from the eastern side of the Indian Ocean for the first time, the aim of this paper is to demonstrate not only the variability in the number of gonopores within a single, presumably genetically homogeneous, population. This feature has been used as a generic or subgeneric character within schizasterids. In this paper characters other than gonopore number are used to differentiate the three subgenera of *Schizaster* (*Schizaster*, *Paraster* and *Ova*) and revised diagnoses of these subgenera given. This paper also aims to illustrate the extent of morphological variation present in other characters throughout ontogeny. Phenotypic variation encompasses not simply the morphological differences between adults within a population, but also differences that occur through the ontogenetic development. After all, the adult phenotype is a product of the morphological variation that the individual undergoes throughout its ontogeny.

It is particularly important to determine the degree of morphological variation present within species of *Schizaster* in order to delineate fossil taxa effectively. In the past many species have been described, particularly last century, on the basis of few specimens (Koehler's *Paraster compactus* being a case in point). Consequently, Lambert and Thiéry (1925) and Kier and Lawson (1978) recorded that up until 1970, 275 species of *Schizaster* and *Paraster* had been described. Categorising the degree of intraspecific morphological variation within this northwestern Australian species of *Schizaster* will therefore provide a useful tool to further studies