

STUDIES ON INDIAN ECHINODERMS - 5. NEW AND LITTLE KNOWN
STARFISHES FROM THE INDIAN SEAS

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ABSTRACT

A starfish collected from the Laccadives showing intermediate characters between the genera *Ferdina* Gray and *Neoferdina* Livingstone is described as a new genus and new species *Paraferdina laccadivensis*. *Halityle regularis* Fisher which was collected off Mandapam at a depth of 275 metres is a new record to the Indian Ocean and a detailed description of the same is given. Another starfish *Nardoa (Andora) faouzii* Macan which is mentioned, is a new record to the Indian Seas.

INTRODUCTION

DURING the course of his studies on Indian Echinoderms the author came across some new and little known Asteroids which are described below.

The author is grateful to Dr. S. Z. Qasim, Director, C. M. F. R. Institute, Cochin for the kind interest and for the facilities provided. He thanks Miss. A. M. Clark, British Museum (Natural History) for many helpful suggestions. He also thanks Mr. M. Alimanikfan and the crew of 'Klaus Sunnana' for kindly collecting *Paraferdina laccadivensis* and *Halityle regularis* respectively and placing at his disposal. He also thanks the Madras Museum authorities for kindly taking a photograph of *Nardoa (Andora) faouzii*.

Paraferdina gen. nov.

Type species: *Paraferdina laccadivensis* sp. nov.

Diagnosis: A genus of Ophiasteridae with polygonal aboral plates, irregular in size with spaces for papular pores; supero-marginal plates regular and uniformly covered by granules; actinal plates imbedded in tissue, no actinal papulae; a single row of short furrow spines with tips projecting to the outside.

Paraferdina laccadivensis gen. et. sp. nov. (Pl. I A)

Material: Minicoy Island (Laccadives), 2 metres. 1 specimen the holotype, C.M. F. R. I. reg. No. 178.

Description of holotype: R/r 35 mm/ 14 mm. 2.5 /1. The size of the abactinal plates varies from 1.0–3.0 mm. Most of the plates are 1.0 mm in diameter and they are arranged in an irregular manner. On each arm 4–7 somewhat enlarged a carinal plates are present. These plates are slightly convex and they are c 3.0 mm in size. At the base of each arm there are seven plates arranged in somewhat indistinct row. The abactinal plates are placed at regular intervals with meshes of small size to accommodate small groups of slightly spaced papulae.

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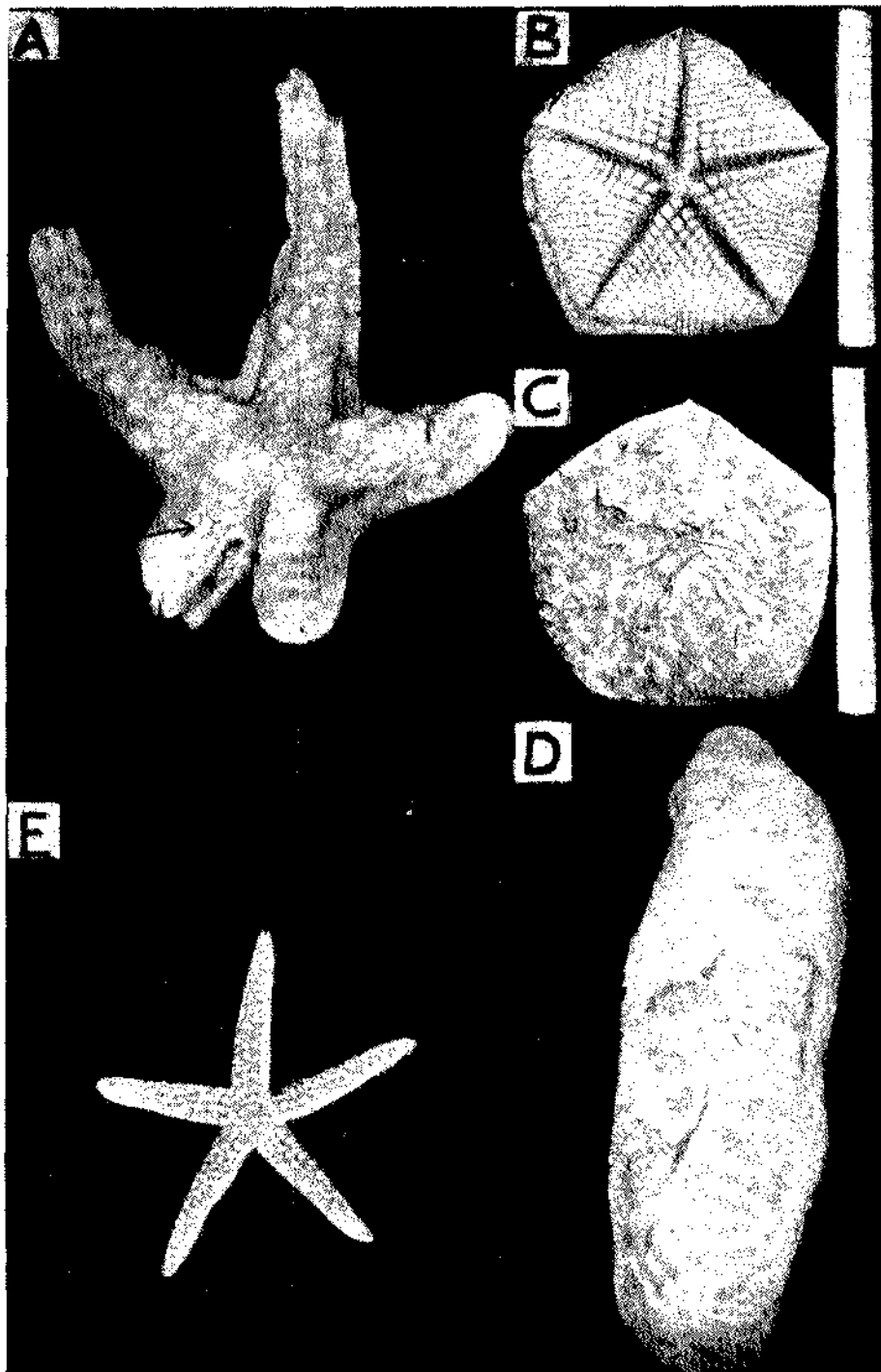


PLATE I. A. *Paraferrina laccadivensis* gen. et. sp. nov., holotype, 14 mm, abactinal view (The arrow points to the meshes which accommodate small groups of papulae). B-D. *Halityle regularis* Fisher, B. Actinal view, C. Abactinal view, D. Lateral view, and E. *Andoua fouzii* Macan, 11 mm, abactinal view.

There are c 15 supero-marginal plates on each side of the arm which are distinct. The size of the plates gradually decreases from the base of the arm to its tip. They are more or less oval in shape and slightly convex. The largest plates are upto 4 mm in breadth and 3 mm in length. The granules on the supero-marginal plates are much finer and more closely arranged than those present on the abactinal plates.

The infero-marginal plates are covered by thick skin over which superficial granules are present. They are rectangular in shape and correspond in number to the supero-marginal plates and gradually decrease in size from the base of the arm to its tip. The actinal plates are more or less square-shaped and arranged in four regular rows on each side of the arm. The first row is very short and extends upto the seventh plate and the third and the fourth rows extend almost to the tip of the arm. Papulae are absent on the actinal side.

The adambulacral plates are 2 mm in length 1 mm in width. Each adambulacral plate bears two short and blunt spines arranged in a single row. The spines are covered by granules on the outer side leaving only the tips of the spines to be seen to the outside.

Remarks: The present new genus *Paraferdina* does not agree with any genus given in the key to the shallow water Indo-West Pacific genera of the family Ophidiasteridae by Clark and Rowe (1971). It shows the characters of the genera *Ferdina* and *Neoferdina*. The genus *Ferdina* was described by Gray (1840) and Clark, (1967) re-diagnosed the genus. Livingstone (1931) made a detailed study of the genus *Ferdina* and restricted it by splitting off *F. cumingii* Gray and several others where some of the abactinal plates are naked as a new genus *Neoferdina*.

Paraferdina resembles *Ferdina* in having spaces for the papular pores and also by the presence of uniform granulation on the actinal and abactinal surfaces but differs from it in having well defined marginal plates and also the abactinal reticulate skeleton is not so well defined. It resembles *Neoferdina* in having well defined marginal plates but differs from it having uniform granulation on the supero-marginal plates.

Halityle regularis Fisher (Pl. I B-D)

Halityle regularis Fisher, 1913, p. 211; Fisher, 1919, p. 362; Clark and Rowe, 1971, p. 34.

Material: One specimen r 220 mm from the Gulf of Mannar off Mandapam; depth 275 metres.

Description: The body is pentagonal with the arms completely reduced in size. On the abactinal side (Pl. I B) there are regular triangular papular areas arranged in hexagons. At the centre of each hexagon there is primary plate with six slender connecting ossicles which separate the six triangles of each hexagon. The primary plates are arranged in very regular series and they lie parallel to the median radial on either side of which three series can be plainly seen. Each triangular area has about 60 - 90 papulae. Each papular pore is surrounded by 6 to 8 granules. The papular areas above the superomarginal plates are large, linear and dendritic with c 150 pores. The primary plates and the trabeculae are covered by small, crowded, polygonal, unequal and slightly convex granules. The granules in the papular areas are slender and longer than those present on the abactinal plates. They are in the form of minute tapering spinelets. Several small, spatulate two jawed slender pedicellariae are present in each papular area.

The marginal plates (Pl. I D) are distinct only at the tip of the arm. The plates bordering the disc are small and indistinguishable from the other actinal plates and they are not arranged in two distinct rows. The plates at the distal end of the arm are polygonal. The supero-marginal plates are larger than the infero-marginal plates. The first two rows of plates along the margin of the disc have a few small two jawed pedicellariae which are smaller than the granules.

The actinal plates (Pl. I C) are arranged in regular rows and are separated by furrows. There are three regular chevrons of rectangular plates without an unpaired interradial plate. The plates adjacent to the furrow are the largest. They are covered by flat, unequal, irregularly polygonal and close-set granules. On the first two plates of the first chevron of plates and the first plate of the second chevron of plates and the odd plates of both the chevrons of plates the granules are of unequal size, polygonal and not so closely packed as on the other plates. All the actinal plates are surrounded by small slightly elongated granules including the furrows. Two jawed, slightly sunken pedicellariae are found on the first two rows of plates adjacent to the ambulacral grooves.

There are two adambulacral plates for each actinal plate. Each adambulacral plate has a number of flat and somewhat elongated granules on the outer side. In addition to these granules there are two rows of spines. The outer row consists of two or three heavy tubercular spines with rounded and wrinkled surface. Near the tip of the arm the outer row has only one stout spine which is somewhat pointed. When there are three spines the middle one is the largest and when there are two spines they are subequal. A large two jawed lanceolate pedicellaria is found between the two groups of the outer row of spines. The inner row consists of 9 or 10 slender, long and blunt spines arranged like a fan.

There are 11 or 12 oral spines on the inner row and the outer row consists of four spines swollen and wrinkled at the tip.

The madreporite is oval in shape and situated at a distance of 20 mm from the centre of the disc.

The colour of the specimen preserved in formalin is yellowish-orange with the papular areas brown. The actinal plates are reddish-white. The eight plates at the base of each jaw are reddish-yellow and the grooves between the actinal plates are reddish.

Remarks: The genus *Halityle* was first described by Fisher (1913) for starfishes resembling the genus *Culcita* but differing from it in having marginal plates distinct in the adult atleast at the distal part of the arm and also in having the papulae arranged in well defined triangular areas. The actinal intermediate areas are covered by regularly arranged polygonal plates, also well defined.

Clark (1914) described a new genus of starfish *Culcitaster* resembling *Halityle*. Fisher (1919) considered *Culcitaster* as a synonym of *Halityle*. This view was also accepted by Clark (1946) in his work on the Australian echinoderms. *Halityle regularis* Fisher is known only from the type locality Sulu Archipelago. The present specimen now recorded from the Indian Ocean differs from the Pacific in the absence of a distinct reticulate skeleton. (This may be due to the delayed preservation since the specimen dredged was left on board the vessel 'Klaus Sunnana' without properly preserving. It was retrieved by the author only after two or three days when the vessel touched the shore and later

only it was transferred to formalin). It also differs from the Pacific species in the presence of distinct marginal plates only at the distal end of the arm and also in the absence of lozenge-shaped papular area just above the supero-marginal plates. It resembles the Indian Ocean species *H. anamesus* in having distinct marginal plates only at the distal end of the arm but differs from it in the absence of small arms.

Distribution: At present there are only two species under the genus *Halityle* namely, *H. regularis* Fisher and *H. anamesus* H. L. Clark. The former is known from the Pacific Ocean and the latter from the shores of western Australia bordering on the Indian Ocean.

***Nardoa (Andora) fouzii* Macan (Pl. I E)**

Nardoa fouzii Macan, 1938, p. 407, pl. I, figs. 8 and 9.
Nardoa (Andora) fouzii A. M. Clark, 1967, p. 187.

Material: A single specimen from Mandapam (Gulf of Mannar); littoral, less than a metre in depth.

Remarks: A detailed description of this species is given by Macan (1938). However, the colour of the species is not mentioned. The present specimen was blue in colour in the living condition.

Distribution: Known only from the Arabian Coast (Clark and Rowe, 1971). It is recorded here for the first time from the Indian Seas.

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