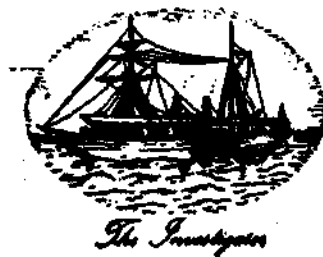


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ECHINODERM FAUNA OF THE PROPOSED NATIONAL MARINE PARK IN THE GULF OF MANNAR

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ABSTRACT

Marine Parks are national assets with a wide variety of uses. They also serve as sanctuaries for endangered marine animals. A full knowledge of the marine parks such as their history, geology, hydrology and its fauna and flora are essential to understand and monitor their valuable resources. The author has collected nearly 100 species of echinoderms belonging to all the five classes from the proposed National marine park area in the Gulf of Mannar. A list of the species is given with comments on some of the species like *Holothuria scabra* and *H. spinifera* which are likely to be endangered as a result of exclusive exploitation.

INTRODUCTION

MARINE parks are national assets and are valuable for their educational and scientific interest, recreational and aesthetic qualities, food resources, genetic resources, industrial chemicals, raw materials, protection against waves and storms, use in construction and also because they represent our heritage (Bakus 1983). A full knowledge of the marine parks such as their history, geology, hydrology and its fauna and flora are essential to understand and monitor their valuable resources.

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MATERIAL AND METHODS

Extensive collections of echinoderms for over seven years during 1963-70 in the Gulf of Mannar were made. The most common method of collection was to search for them

in the intertidal region during the low tide. Collections were made on rocky coasts, sandy shores, muddy flats and coral reefs to collect different species of echinoderms which live in different habitats. Mask and snorkel were used on the coral reefs to collect and so study the habits of the animals *in situ*. Dredge collections were made on algal beds using a naturalist's dredge. Trawl nets and shore seines were regularly examined for material which comes from the bottom. The material collected by the underwater survey team at Tuticorin by using SCUBA diving were also examined.

List of echinoderms collected within the limits of the proposed National Marine Park in the Gulf of Mannar are given below. All the species have been collected within 20 m depth. At the end of the paper comments on a few species such as *Holothuria scabra* and *H. spinifera* which are likely to be endangered due to exclusive exploitation are given.

Class : Crinoidea

Capillaster multiradiatus (Linnaeus)
Comanthus schlegli (P. H. Carpenter)
Comanthus parvicirrus (J. Muller)
Comaster gracilis (Hartlaub)

Comatella stelligera (P. H. Carpenter)
Heterometra reynaudi (J. Muller)
Lamprometra palmata (J. Muller)
Stephanometra indica (Smith)
Tropiometra carinata (Lamarck)

Class : Asteroidea

Luidia maculata Muller & Troschel
Astropecten hemprichi Muller & Troschel
A. indicus Doderlein
A. monacanthus Sladen
A. polyacanthus (Muller & Troschel)
Craspidaster hesperus (Muller & Troschel)
Anthenea pentagonula (Lamarck)
Goniodiscaster scaber (Möbius)
Stellaster equestris (Retzius)
Siraster tuberculatus H. L. Clark
Asterodiscides elegans (Gray)
Culcita schmideliana (Retzius)
Pentaceraster regulus (Muller & Troschel)
P. affinis (Muller & Troschel)
Protoreaster lincki (de Blainville)
Anodora (Anodora) faouzi (Macan)
Linckia laevigata (Linnaeus)
L. multifora (Lamarck)
Nardoa sp.
Asterina burtoni Gray
A. coronata V. Martens
A. lorioli Koehler
A. sarasini (de Loriol)
Tegulaster ceylanica (Doderlein)
Euretaster cribrosus (V. Martens)
Echinaster purpureus (Gray)

Class : Ophiuroidea

Astroboa clavata (Lyman)
Amphipholis squamata (D. Chiaje)
Dougalophus echinatus (Ljungman)
Ophiactis savignyi Muller & Troschel
O. modesta Brook
Gymnolophus obscura (Ljungman)
Ophiocnemis marmorata (Lamarck)
Macrophiothrix aspidota (Muller & Troschel)
M. longipeda (Lamarck)

M. variabilis (Duoan)
Ophiogymna elegans Ljungman
Ophiomaza cacaofica Lyman
Ophiothela danae Verrill
Ophiothrix exigua Lyman
O. accedens Koehler
Ophiocoma scolopendrina (Lamarck)
Ophiocomella sexradia (Duncan)
Ophionereis dubia (Muller & Troschel)
Ophiarachnella gorgonia (Muller & Troschel)

Class : Echinoidea

Astropyga radiata (Leske)
Stompholites variolaris (Lamarck)
Salmaciella dussumieri (L. Agassiz)
Salmacis bicolor L. Agassiz
S. virgulata L. Agassiz
Temnopleurus torumaticus (Leske)
Toxopneustes pileolus (Lamarck)
Tripneustes gratilla (Linnaeus)
Echinometra mathaei (de Blainville)
Clypeaster humilis (Leske)
Laganum depressum Lesson
L. laganum (Leske)
Peronella orbicularis (Leske)
Echinodiscus auritus Leske
E. bisperforatus Leske
Echinolampas alexandri de Loriol
E. ovata (Leske)
Lovenia elongata (Gray)
Metalia sternalis (Lamarck)

Class : Holothuroidea

Bolitaeschia marmorata Jaeger
Holothuria atra Jaeger
H. edulis Lesson
H. pardalis Selenka
H. leucospilota Brandt
H. scabra Jaeger
H. moebii Ludwig
H. spinifera Theel
H. hilla Lesson
Stichopus variegatus Semper
S. chloronotus Brandt

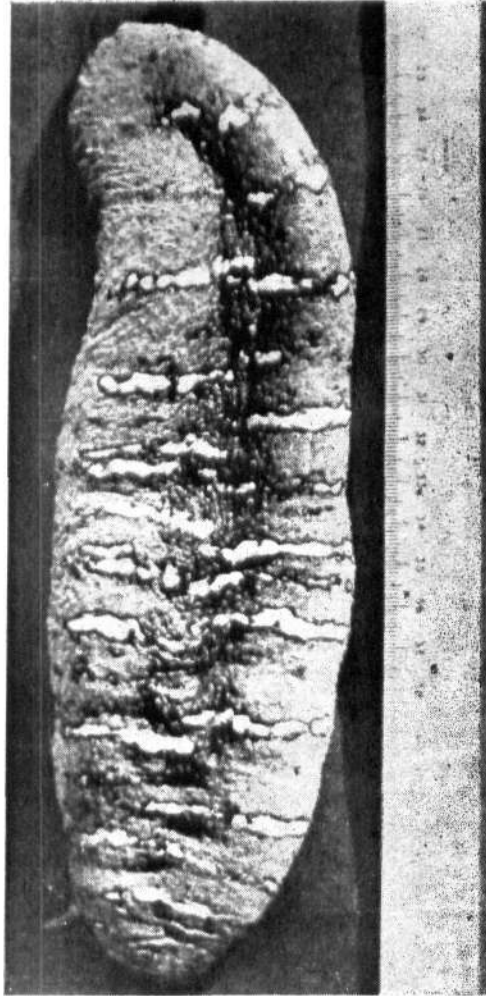


PLATE I. *Holothuria (Metriatyla) scabra* from the Gulf of Mannar.

Havelockia versicolor (Semper)
Hemithyone semperi (Bell)
Pentacta quadrangularis (Lesson)
Pseudocolochirus violaceus (Theel)
Stolus buccalis (Stimpson)
Psolus sp.
Actinocucumis typicus Ludwig
Phyllophorus (Phyllophorella) parvipedes
 H. L. Clark
Acudina molpadioides (Semper)
Protankyra sp.
Synaptula recta (Semper)

REMARKS

At present only two species viz., *Holothuria scabra* and *H. spinifera* are exclusively used in the preparation of *Beche-de-mer*. Steps to conserve these two species which are likely to be endangered are given below.

Holothuria (Metriatyla) scabra Jaeger (Pl. I)

This is the most important species for the preparation of *Beche-de-mer* in the Gulf of Mannar at present. It grows to a large size of 400 mm. More than 90% of the *Beche-de-mer* is now prepared from *H. scabra*. Krishna-swamy and Krishnan (1967) based on the reproductive cycles of the species have found that it breeds twice in a year once in July and again in October. According to Mary Bai (1980) *H. scabra* breeds biannually, once in March-April and again in September-October. James (1978) has recorded a juvenile of 30 mm length during April from Palk Bay. In order to conserve the resources, catching of *H. scabra* should be banned during the above two months. Normally by October with the onset of north east monsoon the fishing is stopped since *Beche-de-mer* preparation requires good sun light for drying and also during the rainy season the product gets spoilt since it is hygroscopic. So effective measures have to be

taken to stop fishing in July to allow them to spawn. Another measure to conserve the species is to impose a ban on catching of young ones which are below 150 mm in length. The *Beche-de-mer* prepared out of smaller forms is full of sand since it is difficult to make them eviscerate. Therefore the quality of the product is much reduced due to small size and sand. By enforcing ban on fishing small sizes we can improve the quality and quantity of *Beche-de-mer* and at the same time allow them to breed and replenish the stock. Another method to conserve the species is to farm them. Experiments conducted by James (1983) can be tried in the Gulf of Mannar after locating the juveniles. It will also be worth attempting the hatchery for this species.

Holothuria (Theelothuria) spinifera Theel

Holothuria spinifera contributes to less than 10% for the *Beche-de-mer* at present. This species is much rare being known only from the Red Sea, Australia, Philippines, Sri Lanka and the Gulf of Mannar and Palk Bay on the Indian side. It grows to a maximum size of 300 mm. The conservation methods suggested for *H. scabra* can be tried for this species also. The reproductive cycle for this species is unknown.

It may be mentioned here that the quality of *Beche-de-mer* prepared from the above two species is low when compared to species such as *Microthele nobilis*, *Actinopyga mauritiana*, *A. miliaris*, *A. echinites*, *A. lacanora* and *Thelenota ananas*. These species are available in plenty in Andaman and Nicobar Islands and also at Lakshadweep. Their introduction in the Gulf of Mannar can be tried. This will not upset the ecosystem since they are found to be distributed in Sri Lanka. This step will not only boost *Beche-de-mer* export but also relieves the stress on *H. scabra* and *H. spinifera* which are now exclusively exploited.

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