

THE ECOLOGY AND DISTRIBUTION OF ALCYONACEANS AT MANDAPAM (PALK BAY, GULF OF MANNAR), SOUTH INDIA¹

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(With one text-figure)

Key words: Alcyonacea, distribution, Mandapam, Gulf of Mannar

New distribution records for 27 species of Alcyonaceans are given. These include major genera *Sinularia* (12 spp.), *Lobophytum* (7 spp.), *Sarcophyton* (6 spp.), *Dampia* (1 sp.) and *Nephthya* (1 sp.). The factors that influence the distribution of corals, such as temperature, sedimentation and currents on this reef are discussed.

INTRODUCTION

Mostly the coral reefs of fringing type are found in the Palk Bay and Gulf of Mannar on the southeastern coast of India. These are chiefly located around various islands between Tuticorin and Rameswaram in the Gulf of Mannar and Palk Bay at Mandapam. The reef lies between 79° 27' 40" to 79° 8' E long. and 9° 17' N lat. (Fig. 1). The Palk Bay is a shallow basin with an average depth of 9 m, with mainly muddy bottom at inshore regions and depth ranges from 1 to 5 m. In spite of some investigations of South Indian coral reefs (Foote, 1889; Walther, 1891; Thurston, 1895; Sewell, 1935; Pillai, 1969, 1971) our knowledge, particularly of Octocoral fauna, is scanty. The only literature available on this part of the Indian Ocean is Hickson (1906), Pratt (1906), Thomson and Henderson (1906), Thomson and Simpson (1909).

MATERIAL AND METHODS

Alcyonacean coral material was studied from collection made by N.I.O, Goa, Andhra University, Waltair and I.I.C.T. Hyderabad during May 1993 to February 1994 by SCUBA

diving under the D.O.D. National Project on "Development of Potential Drugs from the Sea." Some environmental and hydrological parameters such as temperature and salinity were recorded.

All the specimens reported are preserved in 70% methanol and deposited in the Marine Biology Museum and Taxonomy Reference Centre at the National Institute of Oceanography, Goa.

RESULTS

Major environmental and hydrological conditions show that the study area receives both the southwest and northeast monsoons. Rain is moderate to heavy during October to mid-December, with occasional gales. The average atmospheric temperature varies from 25°C to 31°C with maximum and minimum in May and January respectively.

The surface temperature of the waters of Palk Bay varies from 24.6°C to 29.1°C, with the lowest and highest in January and April respectively. The salinity is low during January, gradually rising to the maximum in November, followed by a decline in December. It varies from 33 to 36 ppt. The tidal range is usually within an amplitude of one metre. The Palk Bay remains calm during most months except at the onset of

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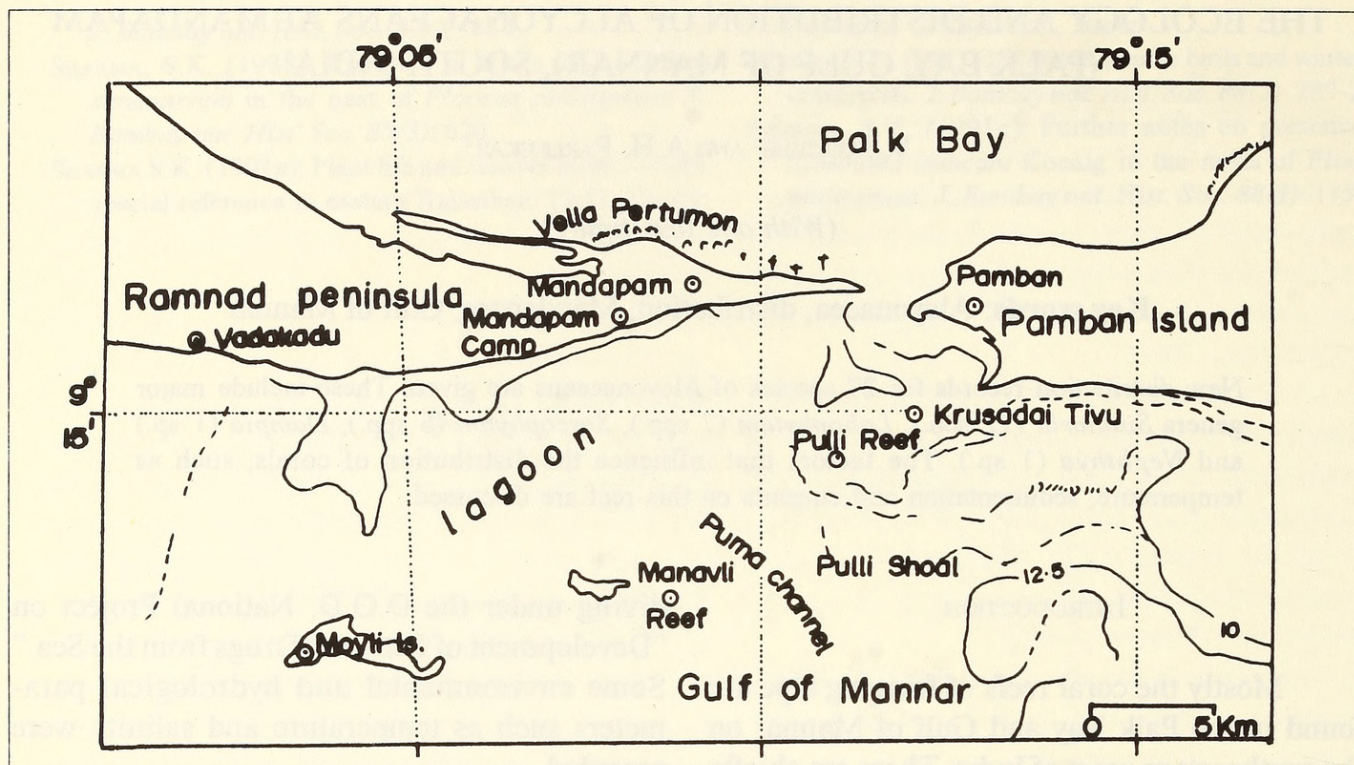


Fig. 1. Collection sites in Gulf of Mannar

the northeast monsoon, when turbulent conditions prevail. No fresh water inflow dilutes the sea near Mandapam.

The study material comprises 27 species which are listed in Table 1. Most of them are new geographical records for this part of the Indian Ocean.

The most abundant and dominating genera in the study area are *Sinularia dessecta* and *S. leptoclados*. The species *Sinularia leptoclados* is well known from numerous Indo-Pacific sites (Verseveldt, 1980). The most common *Lobophytum* spp. are *Lobophytum crassum* and *L. pauciflorum*. *Sinularia manaarensis* in Krusadai Island confirms its exclusive occurrence (Verseveldt, 1980). In the genus *Sarcophyton*, *Sarcophyton elegans* and *S. trocheliophorum* were the most frequent soft corals.

The reefs in the Gulf of Mannar are the most diverse in soft corals compared with other parts of the Indian Ocean (Pillai, 1971). The present study shows the accumulation of

numerous alcyoniids in shallow water. It is also reported that a marked difference in the species diversity is found in deeper areas (Benayahu, 1985). This survey also reveals the presence of nephtheids and patchy assemblages of *Sinularia brassica* and *S. abrupta*, confirming earlier findings. The rare occurrence of these species could be due to their low reproductive potential and short-distance dispersal of planulae. Another major factor which influences alcyonacean distribution could be the availability of a firm substrate suitable for the settlement of planulae. Depth distribution and zonation of different species is determined by biotic and abiotic factors (Dineson, 1983). The present survey also indicates a particular species of soft coral which forms colonies in different reefs. Also, the frequent occurrence of a particular species in these areas suggests resistance to wave action, temperature and salinity variations, tidal influence and sedimentation. These reefs also provide good light penetration and tidal currents which

TABLE 1

SPECIES AFFILIATION OF ALCYONACEANS IN GULF OF MANNAR

PLACE	DATE	DEPTH	TAXONOMIC IDENTIFICATION	AVAILABILITY
Off Krusadai Island	25.06.93	2 m	<i>Lobophytum sarcophytoides</i>	Frequent
Vadakadu Rameswaram	20.06.93	3 m	<i>Sarcophyton trocheliophorum</i>	Frequent
Vadakadu Rameswaram	20.06.93	2 m	<i>Sarcophyton crassocaule</i>	Frequent
Off Manauli Island	23.07.93	2 m	<i>Sinularia dissecta</i>	Frequent
Off Pulli Island	23.06.93	2 m	<i>Sinularia polydactyla</i>	Frequent
Off Pulli Island	23.06.93	2 m	<i>Sinularia abrupta</i>	Frequent
Moyli Island	24.06.93	2 m	<i>Sinularia leptoclados</i>	Frequent
Moyli Island	24.06.93	2 m	<i>Sinularia hirta</i>	Frequent
Krusadai Island	25.06.93	1 m	<i>Sinularia dissecta</i>	Frequent
Krusadai Island	25.06.93	1 m	<i>Sinularia manaarensis</i>	Frequent
Krusadai Island	25.06.93	2 m	<i>Lobophytum pauciflorum</i>	Frequent
Krusadai Island	24.01.94	3 m	<i>Lobophytum crassum</i>	Abundant
Mandapam	27.01.94	3 m	<i>Sarcophyton cherbonneri</i>	Frequent
Krusadai Island	27.01.94	3 m	<i>Sarcophyton elegans</i>	Frequent
Mandapam	27.01.94	3 m	<i>Sinularia exilis</i>	Frequent
Mandapam	27.01.94	3 m	<i>Sarcophyton stellatum</i>	Frequent
Mandapam	26.01.94	3 m	<i>Sinularia intacta</i>	Frequent
Mandapam	26.01.94	3 m	<i>Lobophytum ransoni</i>	Frequent
Mandapam	26.03.94	3 m	<i>Sinularia grandilobata</i>	Frequent
Tuticorin	03.01.94	Deep sea	<i>Sinularia brassica</i>	Abundant
Tuticorin	04.01.94	Deep sea	<i>Sinularia abrupta</i>	Rare
Tuticorin	04.01.94	Deep sea	<i>Dampia poecilliformes</i>	Rare
Tuticorin	05.01.93	Intertidal	<i>Lobophytum compactum</i>	Rare
Mandapam	27.01.93	3 m	<i>Lobophytum variatum</i>	Frequent
Krusadai Island	27.01.93	3 m	<i>Lobophytum latilobatum</i>	Frequent
Krusadai Island	—	3 m	<i>Sarcophyton glaucum</i>	Abundant
Mandapam	26.01.94	3 m	<i>Sinularia granosa</i>	Frequent
Off Mandapam Island	23.06.93	2 m	<i>Sinularia granosa</i>	Frequent
Off Mandapam Island	23.06.93	2 m	<i>Sinularia erecta</i>	Frequent
Tuticorin	14.02.93	2 m	<i>Nephtya sp.</i>	Rare

enrich the water with plankton (Klenker *et al.*, 1976). The frequency of appearance of soft corals could be based on differences in life history or reproductive nature. Also, it is suggested for the soft coral genera of family Xeniidae, that the successful inhabitation in Red Sea is achieved by asexual reproduction and high fecundity (Benayahu and Loya, 1984b).

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