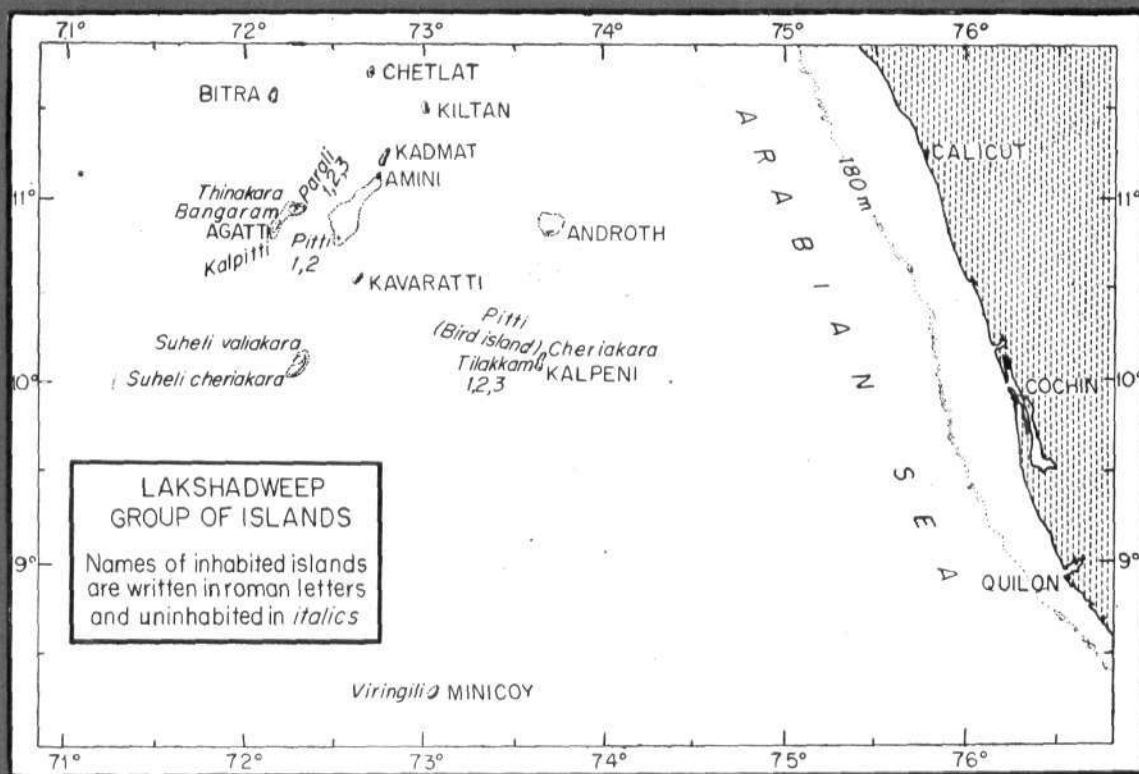




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ANCILLARY LIVING MARINE RESOURCES OF LAKSHADWEEP

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Introduction

Till recently the Lakshadweep archipelago was not investigated upon seriously from a resource point of view. In the latter half of the 19th century attempts have been made by some British naturalists to study the fauna and flora of the Lakshadweep and Maldive Archipelagoes. (Alcock, 1895 - 1900, 1902; Borradaile, 1903; Betts, 1930 and Burton, 1940). Observations of a general nature on fish and fisheries of the islands were subsequently made by Ayyangar (1922), Mathew and Ramachandran (1956) and Balan (1958). However, published information on the marine living resources of the Lakshadweep, other than those of tunas and corals are rather scattered and scanty.

While the major commercially important resources like the corals, tunas and other fish resources of the archipelago are dealt with elsewhere in this volume, here the potential ancillary resources are touched upon.

Sea weeds, crustaceans, molluscs, sponges, echinoderms, reptiles such as turtles, birds etc, are treated here as ancillary resources. There are few others like the beautiful coral reef fishes which are of potential value as an export item for marine aquaria all over the world. Of the above, only the marine algae have been systematically surveyed from a resource assessment angle (Anon, 1979), by the Central Salt and Marine Chemicals Research Institute. Information on the others are based on faunistic observations conducted now and then by different workers.

Algae

Ten islands (Kavaratti, Agatti, Bangaram, Amini, Kadmat, Chetlat, Kiltan, Androth, Kalpeni and Minicoy) were surveyed for the marine algal resources during the 1977-'79 period and estimates of the standing crops were made. Marine algal distribution was generally sparse and heterogenous. All islands except Bangaram supported the growth of marine algae.

The biomass estimates (wet) of the standing crop for all Lakshadweep islands covering an area of 1,334ha was estimated to be within 4,940-10,110 tonnes consisting of 980-2,100 tonnes of agarophytes, 10-16 tonnes alginophytes and 3,950-7,980 tonnes of others.

The major agarophytes observed were *Gelidiella acerosa*, *Gracilaria edulis*, *Gelidium rigidum* and *Gelidopsis repens*. Alginophytes were meagre represented by *Turbinaria* and *Sargassum*, observed in Kalpeni, Androth and Minicoy. Among the sea weeds categorized as 'others' *Halimeda*, *Dictyota*, *Laurencia*, *Jania*, *Tolyptocladia*, *Caulerpa* and *Chondrococcus* constitute more than 75% and are potentially useful sea weeds. Altogether 82 species of sea weeds were collected during the survey, of which only 60 species are found in estimable quantities.

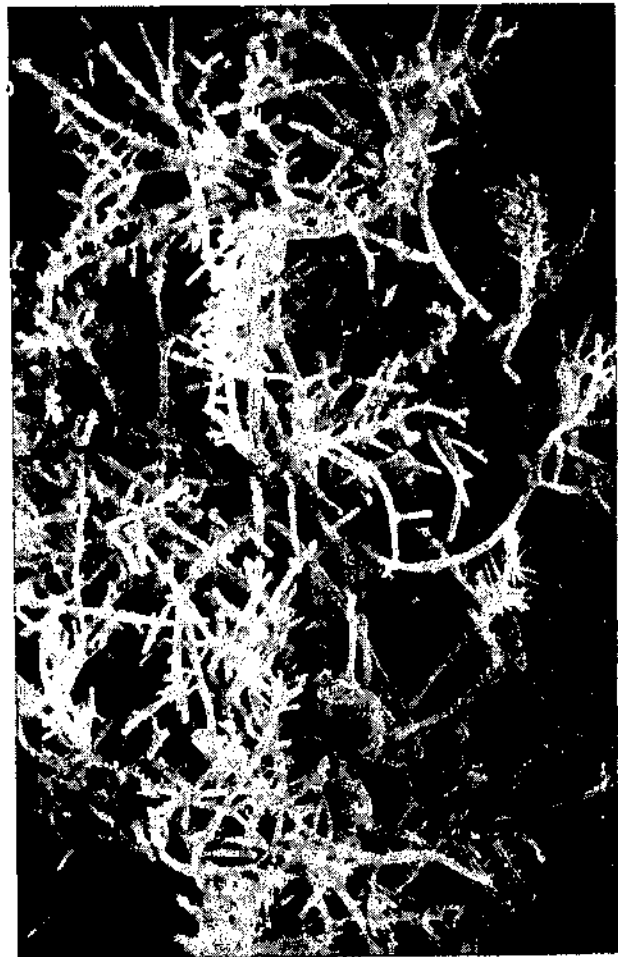


Fig. 1. *Gelidiella acerosa* one of the very common sea weed resource in the Lakshadweep.

Halimeda gracilis was the most abundant form occurring in lagoon and reef areas. *Gelidiella acerosa* occurred in all islands except Chetlat and Kiltan.

It is reported that the agarophyte resource with a preponderance of *Gelidiella acerosa* offer an immediately exploitable resource for establishing an Agar agar production unit. Kalpeni, Kavaratti, Agatti and Kadmat islands have more agarophytes around them. *Caulerpa*, *Dictyota* and *Laurencia* can be used as food in different forms.

Regulated harvest of the sea weeds up to 50% level of the resources is recommended in the report (Anon, 1979).

Crustacea

The prawns and crabs are not fished in Lakshadweep. The brachyuran crabs and lobsters of Lakshadweep have been studied by Alcock (1895, 1896, 1898,

1899 & 1900) and Borradaile (1903 & 1906). Alcock reported 41 species of crabs and Borradaile 52 species of crabs and two species of lobsters. Sankaran-kutty (1961) recorded 36 species of crabs from the Lakshadweep out of these 27 were from Minicoy, and the rest from Kavaratti, Aminidivi and Bitra islands. The species include representatives of the families Portunidae, Grapsidae, Ocypodidae, Xanthidae, Maiedae, Parthenopidae and Calappidae.



Fig. 2. *Panulirus penicillatus*, another lobster found in Lakshadweep.

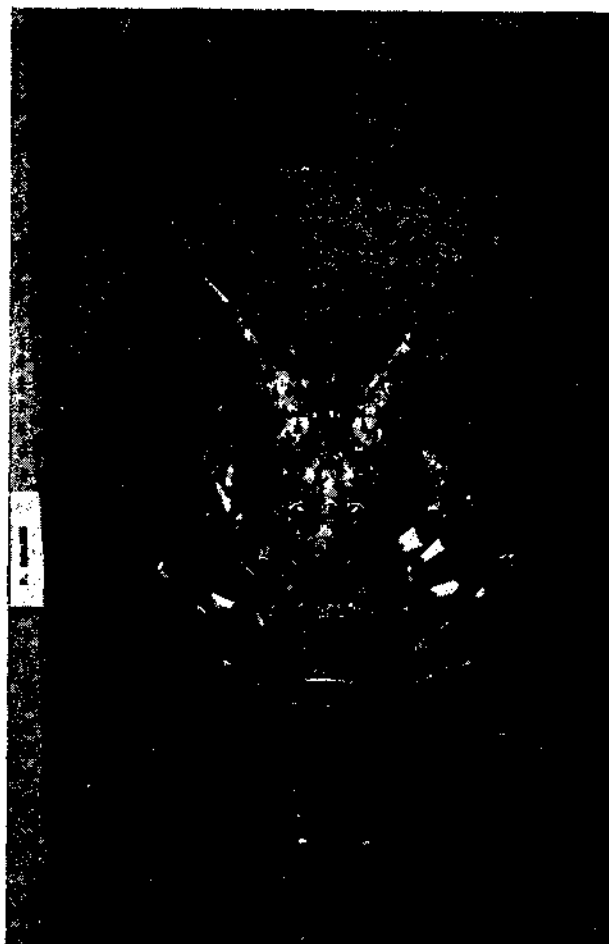


Fig. 3. *Panulirus homarus*, a common lobster of economic value in the Lakshadweep.

The significant abundance of any particular family is not stated in the above literature, since they were mainly faunistic or taxonomic studies based on one time or intermittent collections by different authors.

Kathirvel (MS) collected 28 species of brachyuran crabs and one species of Panulirid lobster from Kiltan atoll. Meiyappan and Kathirvel (1978) published records of the brachyuran crab *Grapsus albolineatus*, *Cardiosoma carnifex* and the lobsters *Parribacus antarcticus* and *Panulirus homarus* from Minicoy. Pillai, et al. (1985)

recorded *P. versicolor* mostly during November–January period in Minicoy. *P. versicolor* is found to be the most common. The distribution pattern of the lobsters was found to be seasonal, more common on the

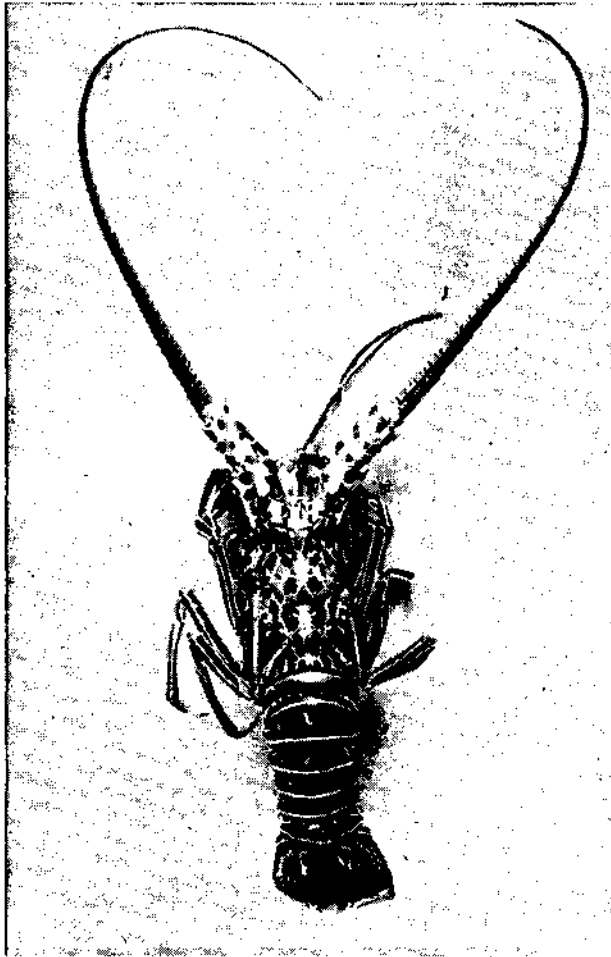


Fig. 4. Painted rock lobster *Panulirus versicolor* – a potential reef resource in the Lakshadweep.

reef flats during November–January period. Meiyappan and Kathirvel (1978) found *P. penicillatus* to be the most common lobster in Minicoy in the late seventies while Pillai *et al.* (1984) found *P. versicolor* as the the major lobster at Minicoy. This species is also recorded from Kiltan atoll (Kathirvel, MS).

Mollusca

Smith (1906) listed *Comus*, *Terebra*, *Sistrum*, *Purpura*, *Nassa*, *Oliva*, *Solarium*, *Trochus* and *Circe* as the common genera widely distributed in Maldives and Lakshadweep. Burton (1940) reported the common occurrence of the giant clam *Tridacna* over the reef of Chetlat Island when he visited the Lakshadweep in 1935. He recorded the shells of *Pterocera* from Bitra.

Octopus was recorded from Chetlat and Bitra where they were found in plenty over the reef. In recent times on an average 20 tonnes of these are landed annually in the Lakshadweep islands. *Octopus macropus* and *O. vulgaris* are common in Minicoy, the former forming about 80% of the catch. Both species inhabit crevices in the reef-flat. The islanders use them as food and as bait for fishing.

Appukuttan (1973) observed nine species of coral boring bivalves causing destruction to the fringing reefs of the Islands. They belong to the genera *Lithophaga*, *Botula*, *Petricola*, *Gastrochaena* and *Jeuannetia*. Appukuttan and Pillai (MS) observed that the molluscan fauna of Lakshadweep is similar to that of other islands



Fig. 5. *Tridacna* sp. the giant clam that grows to more than half a metre in length.

in the Indian Ocean. They have listed 48 gastropods and 12 bivalves and found the abundance of gastropods in number and species particularly in the littoral and eulittoral reef-flat habitats.

The important families of gastropods observed in Lakshadweep are Patellidae, Trochidae, Neritidae, Littorinidae, Planaxidae, Strombidae, Cassididae, Cypraedae, Muricidae, Buccinidae, Conidae, Vasidae, Terebridae, Ellobidae and Cerethidae. Among the bivalves Arcidae, Mytilidae, Pectinidae, Ostreidae, Chamidae, Tridacnidae, Veneridae, Mactridae, Labitinae, Tellinidae, Teredinidae and Pholadidae are the most important groups.

Among the gastropods found in these islands, Top shells (Trochidae), Spider conch (Strombidae), Cone shells (Conidae), Cowries (Cypraedae) and Helmet shells (Cassididae) are commercially important. *Trochus radiatus*, *Lambis* spp., *Arabica arabica*, *Comus* spp., *Charonia tritonis* and *Cassis cornuta* are some of the beautiful shells available in good quantity in these islands. Giant clams *Tridacna maximum* is found in good numbers in all the islands in the lagoon. Till 1980 good population of the giant clam was observed in the lagoon of Minicoy but at present dead shells of this clam are found in large numbers along with corals. The probable reason for large scale mortality can be siltation due to the dredging operation done in the harbour area. There was also an incidence of aggregation of large spider shells (*Lambis truncata*) numbering 400-500 ranging 20-25 cm in length and weighing 1.15 kg in the lagoon during January, 1984 when water was calm. This species is not found very often in reef flat. It is understood from the older generation of fishermen of the islands that there was good settlement of green mussel *Perna viridis* in Amini Island 20 years back and was used for edible purpose by local people. At present no settlement of mussel is reported from any of the islands. *Cypraea monita* is found in plenty in the inner reef-flat and 1 kg of shell is valued at Rs. 30-40. Usually during low tide large quantities of shells are picked up by women and this has got a good market in the mainland.

Sponges

Thomas (1973, 1979 & MS) mentions 41 species of sponges from Minicoy including typical coral and shell boring species, such as *Spirastrella cuspidifera*, *S. inconstance* and *Cliona* spp. The common Indian bath sponge *Spongia officianalis* has been observed in Minicoy. Many sponges recorded from Minicoy are rich in Bromine and Iodine.

Echinodermata

Gardiner (1903) observed surface living holothurians very commonly, in Minicoy and mentioned about

large numbers of a white variety living in sand. Burton (1940) recorded holothurians of several varieties in every



Fig. 6. *Holothuria atra* - a common sea cucumber on reef-flat and lagoon.



Fig. 7. *Thelenota ananas* - a holothurian used in the preparation of Beche-de-mer, an export product. (Photo courtesy : D. B. James)

pool in Chetlat. *Holothuria atra*, *H. seabra*, *Actinopyga mauritiana*, and *A. echinites* are the most abundant species in Minicoy. Ten species of echinoderms were recorded by James (MS) from Kiltan atoll of the northern part of the Lakshadweep. These include the



Fig. 8. *Bohadschia marmorata* - another holothurian used in preparation of Beche-de-mer. (Photo courtesy: D. B. James)

holothurians *Stichopus chloronotus*, *Bohadschia marmorata*, *Holothuria rigida*, *H. impatiens*, *H. pardalis*, *H. leucospilota* and *Actinopyga mauritiana*. The cake urchin *Clucila novaeguineae* and ophiuroid *Ophiocoma orinaceus* were the other echinoderms collected around Kiltan.

These information point to the possibility for a modest *Beche-de-mer* industry in a suitable location in the Lakshadweep.

Turtles

Bhaskar (1984) reports four species of turtles which occur and nest in Lakshadweep. They are the hawks-bill (*Eretmochelys imbricata*), the olive-ridley (*Lepidochelys olivacea*), the green turtle (*Chelonia mydas*) and the leather-back (*Dermochelys coriacea*). The last one is reportedly very rare.

The green turtles nest mainly during the southwest monsoon (June-September) on the Suheli Valiakara,

Suheli Cheriakara, Tinnakara, Bangaram and Parali. A feeding and nesting population of green turtles are observed in Minicoy. A few hawks-bills and olive-ridleys also nest on Androth, Kadmat and Agatti islands. Trading in hawks-bill scutes through Mangalore existed in earlier years. Turtle fat especially that of the green, olive-ridley and the leather-back is used by islanders for water proofing the wooden boats.

A cautious approach to exploitation of the turtle population of Lakshadweep archipelago is necessary as their existence here with least human predation serves to conserve them in this niche. Therefore future activities of constructions, agricultural operations etc. along known nesting beaches may be carefully planned.

Birds

Alcock (1902) found the whole sand banks of Pitti island literally covered with the young of two species of terns. The only specific study on the birds of the Lakshadweep islands seems to be that of Betts (1938). Of the 44 species of birds reported by Betts there were several shore and water birds like plovers, terns, sand pipers, shear waters, teals and herons.

Marine ornamental fishes and other marine organisms

Trade in marine ornamental fishes for home aquaria in different parts of the world started some time in the mid sixties. Philippines, Indonesia, Singapore and Sri Lanka are some of the countries exporting marine ornamental fishes. Mostly marine species caught in the wild are used in this trade. Most salt water ornamental fishes come from coral reefs.

Cheap to very expensive ornamental fishes are available. Sri Lanka price for a specimen of the file fish is reportedly 50 US \$. (Kvalvas Gnaes, 1982). Varieties such as *Abudefduf*, *Amphiprion*, *Apogon*, *Coris*, *Balistes*, *Platax* and several other beautiful coral reef fishes are available in Lakshadweep. Ornamental invertebrate such as sea anemones, crustaceans, echinoderms and sedentary tube worms are also reared in marine aquaria and hence have marketing possibilities.

Limited exploitation of these hitherto untouched resources for capturing a share of the worlds ornamental marine organisms trade is worth attempting.

