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MARINE LIVING RESOURCES OF THE UNION TERRITORY OF LAKSHADWEEP —

**An Indicative Survey
With Suggestions For Development**

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Limited Circulation

12. BECHE-DE-MER RESOURCES OF LAKSHADWEEP

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Information on the *beche-de-mer* resources of Lakshadweep is limited. Earlier no surveys were conducted to estimate the resources of holothurians used in the preparation of *beche-de-mer*. In fact very little information is available even on the holothurians of the Lakshadweep. Koehler and Vaney (1905, 1908, 1910) reported 18 species from deep sea, eight species from shallow-water and one species from deep sea around the Lakshadweep. Of the eight shallow-water species reported only *Actinopyga mauritiana* is of commercial importance. James (1969) catalogued 15 species of holothurians from the Lakshadweep of which only four species viz., *Thelenota ananas*, *Holothuria (Microthela) nobilis*, *Actinopyga miliaris* and *A. mauritiana* are used for *beche-de-mer* preparation. James (1973, 1986) pointed out that the Lakshadweep is very important for the exploitation of holothurians for *beche-de-mer*. Daniel and

Haldar (1974) listed 23 species of holothurians from the Lakshadweep including deep sea forms. Mukhopadhyay and Samanta (1983) reported 12 species of holothurians from the Islands of Androth, Kalpeni and Minicoy. Of these, three species viz., *Actinopyga mauritiana*, *Bohadschia marmorata* and *Thelenota ananas* are used in the preparation of *beche-de-mer*. Recently James (1983) stated that detailed survey needs to be conducted in the Lakshadweep especially for the commercially important species of holothurians.

RESOURCES

So far there is no quantitative estimation of the resources of the holothurians from the Lakshadweep. The holothurians chiefly live in the lagoon and some species live only on coral reefs. According to Mannadiar (1977) the lagoon area in the Lakshadweep is about 420

sq. km. Species of holothurians like *Holothuria (Microthele) nobilis*, *Bohadschia argus*, *B. marmorata* and *Thelenota ananas* occur in the lagoon. Other species of holothurians like *Actinopyga mauritiana*, *A. miliaris* and *A. echinites* are found to live on the reefs. In the case of the species found in the lagoons actual numbers are counted in unit areas and later raised to the total area of the lagoon of each Island. When holothurians are distributed all over the lagoon from the shore to the reef their numbers are enumerated at different transects and then the total number is estimated for the whole lagoon. For species living on the reefs number of species are counted in unit areas and then raised to the whole area of the reef.

Although 35 species of holothurians are known from Maldiva and Lakshadweep area, during the present survey only 25 species of holothurians are collected. Of these only seven species viz. *Holothuria (Microthele) nobilis*, *Thelenota ananas*, *Actinopyga miliaris*, *A. echinites*, *Bohadschia argus* and *B. marmorata* are used in the preparation of *beche-de-mer*. Of the seven only four species viz., *Holothuria (Microthele) nobilis*, *Actinopyga mauritiana*, *Bohadschia argus* and *B. marmorata* occur in appreciable quantities in some of the Islands which lend themselves for commercial exploitation.

Bohadschia argus (Fig. 1) is the most abundant species in the Lakshadweep. This is popularly known as Tiger or Leopard fish. Its size ranges from 300-500 mm and width ranges from 100-120 mm, with body wall 6-12 mm in thickness. Live weight of the animal varies



Fig. 1 (*Bohadschia argus*)

from 1-2 kg. It is common on coral sand and at depths from 2-6m. Body is cylindrical with very smooth surface. Cuvierian tubules are extruded through the body in large quantities. Colour is black with distinctive eye-like spots

all over the surface which are conspicuously encircled with light colour. Because of the abundant supply of Cuvierian tubules it is not considered to have high value for *beche-de-mer* since handling of the live specimen is difficult in the field. In Kilakarai on the mainland when they collect *Bohadschia marmorata* which is also having abundant supply of Cuvierian tubules, they make a slit in the field itself and throw out the Cuvierian tubules and viscera in the sea and bring only the body wall of the animal. The same method can be adopted for this species in Lakshadweep. It is a very common species and is collected during the survey from Chetlat, Kiltan, Kadmat, Amini, Agatti and Kavaratti. It should be available in other Islands also. The resource is maximum at Kadmat and it is estimated at 1177 tonnes. At Kiltan 368 tonnes and at Chetlat 160 tonnes were estimated. At Amini the resource was poor and the estimate came to only 11.9 tonnes.

Holothuria (Microthele) nobilis (Fig. 2) is by far the best holothurian suited for *beche-de-mer* preparation. This species is popularly known as Test fish or Mammy fish. It commands highest price in the *beche-de-mer* market. This species occurs in two colour forms, the white and black. The white form is said to be more valuable. The white form is usually found in

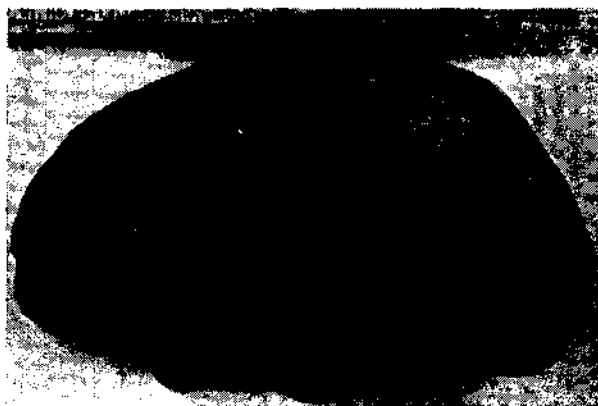


Fig. 2 *Holothuria (Microthele) nobilis*

more than 3 m depth of water. It occurs upto a depth of 30 m. It is most abundant on clean sand among the reefs. Young white forms live among algae. The black form is found in shallow waters from the reef to about a depth of 3 m. During the present survey the specimens were collected only from the shallow waters and therefore only black forms alone were encountered.

It grows to a length of 300-400 mm and the width varies from 100-150 mm, with body wall 10-12 mm in thickness. In the living condition the body is like a loaf. The most distinguishing external feature is the presence of six to eight lateral teat-like projections which are evident only when seen under water in the living condition. Live weight varies from 2-3 kg. Colour in the live condition is dark brown or black on the top and white beneath or yellowish white mottled with black or brown on white background. During the survey this species has been collected from Chetlat, Kiltan, Kadmat, Amini, Agatti and Kavaratti. Based on the survey 1882 tonnes were estimated at Kavaratti, 209 tonnes at Chetlat, 172 tonnes at Kiltan and at Amini. 165 tonnes

Next in abundance is *Bohadschia marmorata* (Fig. 3.) It is popularly known as brown sand fish. It grows to a length of 400 mm. The body wall is 10-15 mm in thickness. Body is cylindrical in shape with tubefeet distributed all over the body with the ventral side slightly flattened.



Fig. 3 *Bohadschia marmorata*

It lies freely on the surface of sand in the lagoon. A coating of sand is found on the body. Copious Cuvierian tubes are extruded from the body when the animal is distributed. Therefore the method adopted for *B. argus* should be adopted for handling the animal during processing. Colour is golden brown with small brown dots. It is found on coarse sand and commonly occurs in depths of 2-6 m. During January, '87 it was found to be common at Kiltan in the lagoon. In Kiltan 103 tonnes and at Chetlat 33 tonnes estimated.

Actinopyga mauritiana (Fig. 4) is a valuable species for *beche-de-mer*. It is popularly known as surf red fish. It grows to a length of 400 mm and width is 80-100 mm. Weight in live condition varies from 0.5 to 1 kg. The shape of the body is almost cylindrical with the ventral side flat with three rows of tubefeet. Body wall is 6 mm in thickness. Colour in the live condition is brick red on the dorsal side and white on the ventral side. In smaller forms the dorsal side has white patches on the sides. It



Fig. 4 *Actinopyga mauritiana*

is found to occur where the surf breaks on the outside of the reef. The tubefeet are firmly attached to the rocks to prevent the animal being carried away by the waves. This species is never encountered in the lagoon and is found at the low water mark. It is one of the most common species in the Lakshadweep and is collected from all the Islands surveyed except at Bitra. At Chetlat it is estimated 201 tonnes and Kadmat 130 tonnes. In Kiltan 23 tonnes and at Amini 10 tonnes were estimated. Exploring beyond the outer reef for this species will be profitable.

Thelenota ananas (Fig. 5) is popularly known as prickly red fish. It is a very valuable species for *beche-de-mer*. It is a massive form and the length ranges from 400- to 700 mm. The width

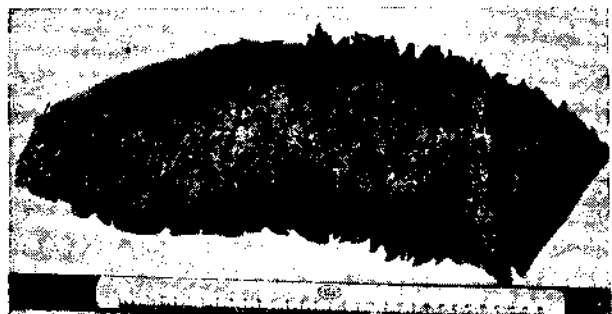


Fig. 5 *Thelenota ananas*

of this species varies from 150 to 200 mm. Live weight varies from 3 to 6 kg. Shape is very distinct and characteristic with numerous pointed teats in groups of two or three all over the body on the dorsal side. There are numerous large tubefeet on the flat ventral side. The colour reported is reddish orange on the dorsal side but at Chetlat the two specimens collected were brown in colour. The lengths of the two specimens collected were 550 and 600 mm and their weights were 2.5 and 2.7 kg respectively. It occurs in the lagoon and it is distributed at a depth of 2-30 m on clean bottoms often beside large coral heads. Formerly one of the most valuable species for *beche-de-mer* but there is only limited demand for it now. Due to high water content it shrinks more than other species during processing. During the present survey it is collected from Chetlat, Kavaratti and Minicoy Islands. It is not possible to give estimates for this species since it was collected only on a few occasions.

Actinopyga echinites (Fig. 6) is also another valuable species for *beche-de-mer*. It is popularly known as deep water red fish. Length ranges from 200-300 mm and width ranges from 80 to 100 mm. Body wall is about 10 mm in thickness. Live weight ranges from 0.5 to 1 kg. The body

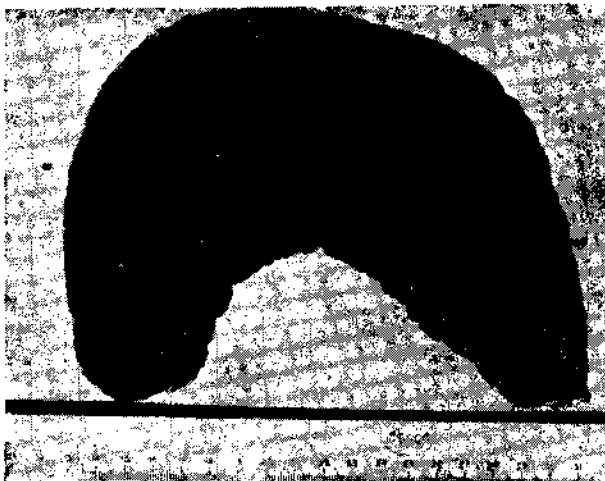


Fig. 6 *Actinopyga echinites*

is sub-cylindrical with the ventral side flat. It is wider in the middle and slightly tapers at both the ends and has a slightly wrinkled surface. Often sand settles on the dorsal side of the body. It is found to be distributed from 3 to 30 m depth and is found to live among live corals. During the survey it is collected only

from Amini Islands. Deep water collection was not made during the survey and this accounts for the collection of a stray specimen on the reef at Amini Island.

Another important species for *beche-de-mer* is *Actinopyga miliaris* (Fig 7). This is popularly known as black fish. Its length ranges from 200 to 300 mm and width from 80 to 120 mm. Thickness of the body wall is about 8 mm. Live weight of the animal varies from 0.5 to 2 kg. The body is cylindrical with three rows of tubefeet arranged on the ventral side sometimes dark

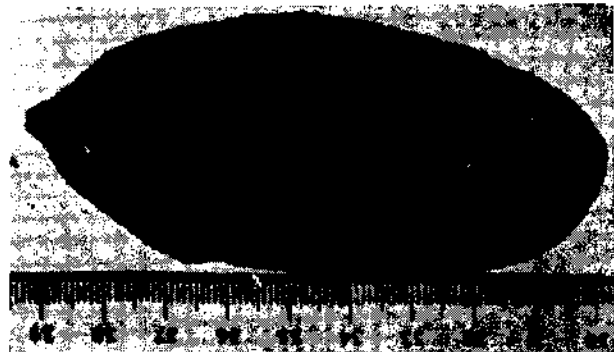


Fig. 7 *Actinopyga miliaris*

brown. It is found mainly in less than two meters depth. It also lives on the reef flats among live corals and among algal beds. During the survey it is collected only from the Minicoy Island. Prices of *beche-de-mer* in the market rank second or third to teat fish.

HISTORY OF BECHE-DE-MER INDUSTRY

The history of the *beche-de-mer* trade in the Lakshadweep is not well documented. Mannandiar (1977) stated that the *beche-de-mer* was once largely produced in Lakshadweep. According to him Sir. W. Robinson who visited the South Canara Islands in 1844-1845 reported that during the fishing season, a good many of the Islanders are employed by the Moplah merchants in the preparation of *beche-de-mer*. This product was in good demand for the Chinese market at Bombay. But slowly the industry began to decline and by the time Mr. W. G. Underwood visited Malabar Islands in 1881-83 the trade has almost died out. They used to be sent to Mangalore and thence shipped to China. The local people do not use it in any form. When the external demand declined, the people neglected the industry and quite naturally became extinct. When Hornell (1917) visited the Kiltan Island in 1908 he saw small quantities

of *beche-de-mer* being processed from three species. Judging from the local names he has given they are *Holothuria (Microthale) nobilis*, *Bohadschia argus* and *Actinopyga mauritiana*, which are even abundant today. He also noted that the methods of curing were different from those practised in Palk Bay. They resembled the methods adopted in Australia and Polynesia. Obviously these methods were introduced by the Chinese. Ayyangar (1922) who made a survey of the fauna and fishing industries of the Lakshadweep noted that the *beche-de-mer* industry which was a success for sometime in Androth had to be abandoned due to an epidemic of cholera and this was attributed to the insanitary condition in which the curer kept his yard at that time. He stated that at Kiltan except for the statement that it was once practised no traces of the industry were found. The failure is attributed to poor prices for the manufactured product.

The present author when he visited Amini, Kadmat, Kiltan and Chetlat during January-February, '87 collected the following information on the *beche-de-mer* industry of Lakshadweep. About 65-70 years back one person who is still alive at Chetlat used to process *Holothuria (Microthale) nobilis*. He used to cut the holothurian into four bits and boil the bits and dry them. He did this for four years. He started the processing when somebody from mainland suggested. When everybody ridiculed him for processing *Koka* (local name for sea cucumber) he finally gave up. In a day he used to process 5-10 specimens. He was paid Rs. 3.00 per kilo those days. In an year he could process about 20-30 kg. At Kiltan there is a place even today known as *Koka Pulikkayar* which means a place to boil holothurians. Copper vessel used for boiling at Chetlat is still available (Fig. 8). The main reason why the *beche-de-mer* industry has not established itself in Lakshadweep is due to the fact that it is difficult to export the material directly to China or even to the main export markets in Singapore and Hong Kong those days. So they used to cater only to the needs of the Chinese population in Bombay and this also died out when the demand for the product slowly dwindled with the disappearance of the Chinese population.



Fig. 8 Vessel used for boiling holothurians at Chetlat

The Lakshadweep Administration made some laudable attempts to revive the industry in recent years. In 1967 one Inspector of Fisheries and a Fisherman belonging to the Fisheries Department were sent to Rameswaram for one month to learn the processing of holothurians. They returned and processed different species of holothurians in the same manner as they adopt for *Holothuria (Metriatyle) scabra* at Rameswaram. They found the holothurian *Holothuria (Microthale) nobilis* suitable for processing and the processed samples were handed over to the Fisheries Department. After that nothing is known. Immediately after this one person from Madras came to Androth and processed nearly seven tonnes of *Holothuria (Microthale) nobilis* by paying a royalty of Rs. 1.00 per kilo to the Administration. He purchased the holothurians by paying five or ten paise per specimen. He processed the material at Androth and Kavaratti. Details regarding the method he adopted for processing could not be collected. Fisheries Department rightly restricted the collection of material below the length of 150 mm. We have to appreciate the foresight showed by the Department to conserve the resource. After two years the same person wanted to once again visit Lakshadweep but the Administration did not give permission.

FUTURE PROSPECTS

The present survey has indicated good resources of holothurians used for processing. In the whole of the Indian region only at Lakshadweep the best quality holothurian *Holothuria*

(*Microthela*) *nobilis* from which first grade *beche-de-mer* can be prepared is available in appreciable quantities. As stated earlier the holothurians are mostly concentrated in the lagoon while some of the economically important species live on the reef. On a very modest estimate the resource of *Holothuria* (*Microthela*) *nobilis* and *Bohadschia argus* will be between 3000 to 5000 tonnes when we take the whole Lakshadweep into consideration. Immediately processing can be taken up in the case of *Holothuria* (*Microthela*) *nobilis* since the processing is very simple and does not involve much labour. Also since this is first grade holothurian for *beche-de-mer* the returns will be high.

Since this species has not been processed earlier in the proper manner the processing is described here in brief. The holothurians are introduced into boiling water one by one after the viscera is thrown out and the inside water is squeezed out. During boiling the flame has to be kept high. Only a few specimens should be boiled at a time to provide individual attention to the specimens. The teat fish tend to float as air is sealed inside with water which builds up pressure with rising temperature. After some time the body wall breaks if proper care is not taken. Bloated specimens are taken out, punctured at the mid dorsal region and put back for the completion of the cooking process. The material is stirred frequently using spatula ended pole. The material has to be boiled for 30-45 minutes. Since it does not become very rubber-like, during boiling the bouncing test for sand fish does not apply here. After boiling the teat fish are removed using ring-net end pole. The material is cooled by placing in raised platform or wooden planks or on top of logs. Each teat fish is cut on the mid-dorsal side leaving a little uncut portions near mouth and cloaca. If there are unremoved visceral portions, the same should be washed out by using lukewarm water. The product should be again boiled for another 15-20 minutes. The product shrinks and the body wall becomes hard. During boiling the material has to be stirred frequently. The material is removed after boiling with a ring net ended pole. Then wooden splinters of 30-50 mm long are placed between the cut edges of the dorsal wall to expose the interior. The material has to be dried in the sun on drying platforms. During the rainy weather the material can be smoke

dried. However smoke dried material is not much favoured by the buyers.

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