SOUVENIR

20th Anniversary

Central Marine Fisheries Research Institute

(Government of India)

ISSUED BY
THE ORGANISING COMMITTEE C. M. F. R. I. RECREATION CLUB
MANDAPAM CAMP

The Indian Spiny Lobster

By M. J. George

Central Marine Fisheries Research Institute

The Indian spiny lobster, *Panulirus homarus* (Fig. 1) and allied species, has come to the lime-light during the past decade due to the great demand in foreign countries as a favourite of epicurean gourmets. Exploitation of the spiny lobster resources of the country, mainly from the south-west coast of India, which remained as a subsistence fishery for the local fishermen till recently has now developed into a more profitable venture encouraged by the marine products export industry. The edible part of the spiny lobster is known to the industry and consumer by the term "lobster tail". Today the frozen lobster tails from India are available in most of the world markets and as such it has become an important commodity earning valuable foreign exchange for the country. The demand for the same is ever on the increase and the industry is on the look out for additional resources.

Fig. 1. The Spiny Lobster PANULIRUS HOMARUS

What is a spiny lobster?

The spiny lobster is one of the crustaceans, a group of cold blooded animals with hard but jointed and flexible "crust" or shell and a number of jointed legs which include over 25,000 species of varied size and description. Among the crustaceans the Decapoda, so called because of their possession of a distinct tail region and ten walking legs, comprises most of the familiar larger shelled forms like shrimps, prawns, crayfishes, lobsters and

crabs. The spiny lobsters have a large and spiny head shield called carapace covering the forward part of the body, a pair of long whip like thorny feelers or antennae extending from the head region, 5 pairs of walking legs and the fleshy abdomen or tail ending in a leathery tail fan. The abdominal region is the popular lobster tail. The spiny lobsters are readily distinguished from the true lobsters and crayfishes by the absence of the large crushing claw.

INDIAN SPECIES AND THEIR IDENTIFICATION

Spiny lobsters are known from the warmer seas throughout the world and support valuable commercial fisheries in many areas. In India there are nearly half a dozen species of these lobsters belonging to the family Palinuridae occurring in the rocky patches of the coastline and contributing to the fishery. For their easy identification the following key based on characters of the tail will be of use.

1. Abdominal or tail segments grooved.....2

   Abdominal or tail segments without grooves.....3

2. Abdominal grooves not interrupted medially..... *Panulirus penicillatus*

   Abdominal grooves interrupted medially..... *Panulirus homarus*

3. Transverse yellow stripes present.....4

   Transverse yellow stripes not present. Colour greenish with patches of blue and yellow..... *Panulirus ornatus*

4. Transverse yellow stripes bounded by blue on either sides..... *Panulirus versicolor*

   Transverse yellow stripes not bounded by blue..... *Panulirus polyphagus*

Among these *Panulirus homarus* is the most important species contributing to the fishery of the south west coast of India. In Bombay waters as well as on the east coast *P. polyphagus* and *P. ornatus* are also fished. Different aspects of the biology and fishery of *P. homarus* of the south west coast of India have been under investigation by the Central Marine Fisheries Research Institute for the past several years.

SEXUAL DIMORPHISM

Sexes are separate and usually males are larger than females. In the male the fifth or last walking leg ends in a single simple claw, but in the female the tips of these legs are provided with three points formed by spurs used in caring for the eggs attached to the under side of the tail. The male also differs by the presence of swollen sexual openings at the base of the last pair of walking legs. The female openings at the base of the third pair of legs are much smaller. When the tail alone is available also separation of sexes is not very difficult. In the males swimming legs on the under surface of the tail end in a single

leaf-like joint. But in the females these legs end in 2 branches, both of those on the first pair being leaf-like while the inner branch on the following legs is a rod-like joint to which the eggs when laid are attached in the form of large mass of orange-red berries.

Habitat and food

The spiny lobsters generally occupy areas with rocky bottom. Movement is usually carried out by walking sideways, forwards or backwards on the legs. By quickly bending and stretching the tail the animal moves backward rapidly to avoid danger. They are most active at night when they move in search of food. They are omnivorous feeders, frequently a scavenging type. Their normal food includes marine worms, molluscs, smaller crustaceans, etc. Food is usually detected at some distance by means of a special sense in the feelers or whips. Traps and other devices used for fishing these lobsters on the south west coast are baited with mussel flesh obtained from the locality.

Life history

Although the animal has a prolonged breeding period the peak season for egg laying is November-December months. After mating the females lay their eggs which remain attached to the swimming legs on the underside of the tail. The number of eggs varies from 2 to 4 hundred thousand depending on the size of the lobster. The eggs hatch into transparent, flat and leafy larvae quite different from the adult. This larva passes through a series of successive moults before it attains the adult form. The most peculiar and characteristic of these stages — the phyllosoma larva – has the form of an extremely thin, flat, roughly circular, transparent disc about 2 cm in diameter with eyes and long legs protruding from the margins. They are planktonic in existence and dispersed far and wide by

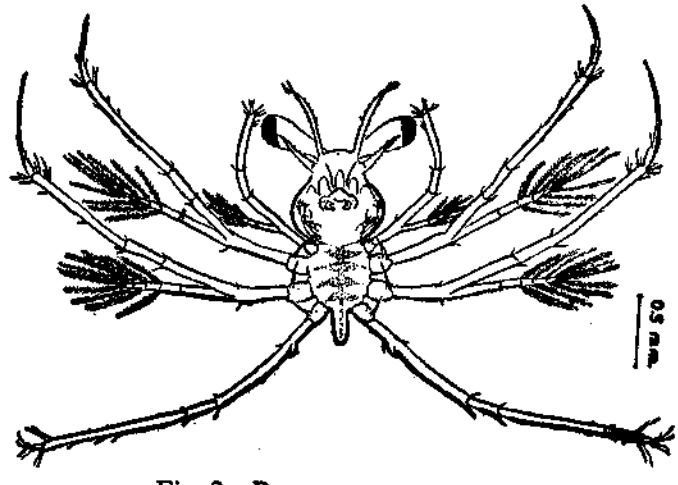

Fig. 2. Phyllosoma larva of Panulirus homarus
(after Prasad & Tampi 1959)

currents. Their dispersal is further aided by the lengthy larval life which is estimated to be about 7 months during which period they undergo about a dozen moults. The phyllosoma

larva finally metamorphoses into a form similar to the adult, known as the puerulus stage, differing from the adult principallv in lacking lime in the shell and also much smaller in size. At about this stage they settle down to the bottom of the sea. The survival of these young lobsters at the time of settlement largely depends on the nature of the substratum particularly in respect of protection it can afford from predators.

Growth and movement

The lobsters grow by periodic moulting, i.e. shedding the shell and growing a slightly larger one. This process of moulting is more frequent when they are small. The tagging experiments conducted by the Institute on the lobster *P. homarus* at Muttom-Colachel area of Kanyakumari district has shown very interesting results about the growth of the animal. In these experiments coloured plastic tags bearing serial numbers are attached behind the head by inserting on the muscle connecting the head and the tail and released in the sea. By the recovery of these tagged animals, a phase in which the complete cooperation of the fishermen is essential, their growth and movement are studied. In experiments conducted so far nearly 30 % recoveries have been obtained and these have shown that after settling on the bottom the animal reaches about 200 to 220 mm in total length during a period of 2 years. Thereafter growth is very slow, being about 20 to 30 mm per year. These experiments also showed that once the animals settle on the grounds of this area there is very little movement taking place, the maximum movements noticed in recovered lobsters being less than 5 miles even after one year.

Fishery

In the Kanyakumari District the lobster fishing season commences in November and ends by April. There is a short season in August—September at Tikkoti and nearby rocky areas of the coast north of Calicut.

The methods of fishing may be divided into those requiring bait and those which are effective without bait The former comprise of the traps, anchor hooks and scoop nets operated in the southern region. The gill nets and cast nets, the latter mostly employed in Tikkoti region, are operated without baits. The traps are constructed out of palm leaf stalk stripped to thin fibres. The fishermen engaged in trap fishing are good divers They dive and leave the trap with baits and heavy stone sinkers inside between crevices and cracks of the rocky substratum overnight. The next morning the catches are emptied and the traps set again. The bait used is the mussel (*Mytilus* sp.) called "sippi" in Tamil.

In the anchor hook fishery anchor shaped hook with 6 sharp arms made of cast iron are let down to the bottom by means of baited lines. When the fisherman feels the lobster biting the bait (mussel meat) the line is pulled suddenly thereby hooking the lobster on its abdomen This fishing is also done during night and from a type of boat catamarans. In the scoop net fishery, baited lines are slowly pulled up when the lobster bites the bait and while nearing the surface scooped up by a round scoop net. Stretches of wall nets set

at the bottom during night are operated as bottom set gill nets in the southern region. Cast nets of different sizes are employed in catching the lobsters to a considerable extent in Tikkoti.

Processing and export

The agents of freezing companies collect from the fishermen all the lobsters as soon as they are landed at the rate of Rs. 0.75 to Rs. 1.50 per lobster depending on the size. These are then beheaded and the tails packed in ice for transport to the processing plants where they are thoroughly cleaned and processed. The tails are graded according to weight and individually packed in alkathene bags and frozen in suitable cartons. It is in this form they reach the consumer.

In recent years the export of lobster tails have increased considerably as is seen from the table below:-

Year	Quantity of frozen lobster tails exported in kg.	Value in Rs.
1962	39,763	2,26,364
1963	55,304	3,12,721
1964	41,304	3,71,021
1965	1,11,600	12,74,517
1966	80,802	14,74,471

Future prospects

With the increasing demand from all quarters of the world and location of more and more resources as a result of exploration and exploitation of different areas along the coastline of India, it is expected that this fishery will play an increasing part in the frozen fish trade of the country. In this connection the recent findings of the occurrence of good concentrations of the spiny lobster *Puerulus sewelli* in the deeper waters off Kerala in depths of 200 to 300 metres along the continental slope, during the exploratory cruises of the research vessels of the department, are of significance. In the search for new resources for the ever increasing demand of the industry this finding might prove to be of immense value.