DEEPWATER PRAWNS AND LOBSTERS OFF THE KERALA COAST

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[Majority of the prawn catch of the Kerala coast comes from the inshore regions within the 10 fathom line. A bottom deposit formed of fine mud rich in humus is found to be the ideal condition for the penaeid prawns. Similarly the lobster is observed in large numbers at localised areas very near the coast in the crevices of rocks.

Though it has been observed that prawns and lobsters exist in deep water as well under different conditions, our knowledge about these forms along the Indian Coasts is very scanty, being restricted to the works of Spence Bate, Alcock, De Man and Ramadan.

Recently, during the cruises of the University Research Vessel "Conch" off the Kerala Coast (1958-1963) two species of deep water prawns and one species of lobster were collected from depths 100 - 180 fathoms. Of these, *Penaeopsis philippi* is found in large numbers occupying an almost continuous bed extending from Anjengo to Mangalore, while *P. rectacutus* has a restricted appearance between Cochin and Calicut. However, some sort of year to year variation has also been observed regarding the abundance of the species at various stations.

Peurulus sewelli has a more restricted distribution, the maximum number being found between Puvar and Cochin. Attempt has been made to correlate the occurrence of the species with the hydrological conditions at the bottom and the nature of the substratum. It is observed that *Peurulus sewelli* occupies a more or less hard bed formed of sand with shell fragments or stones and small percentage of silt, the bottom temperature at the stations varying from 11°C to 14°C. *P. sewelli* is a more or less permanent inhabitant of the edge of the continental shell off the Kerala Coast worthy of attention for detailed investigation with a view to explore the possibilities of commercial exploitation.]

Among the edible crustaceans that are fished from the coasts of India, prawns compose more than 90% of the landings. Along the Kerala Coast, during certain seasons the prawn fishery is so significant that it forms the bulk of the total catch. But the present marine fishery is mostly seasonal and is restricted to shallow inshore regions often not exceeding the 10 fathom line. Though the prawns occur in the inshore waters almost throughout the year, the maximum abundance is observed during the monsoon period June to September. The commercial catch along the Kerala Coast consists of *Metapenaeus dobsoni, M. monoceros, Penaeus indicus and Parapenaeopsis stylifera.*

The sixth session of the Indo-Pacific Fisheries Council at Tokyo held in 1955, while highlighting the importance of the Prawn Fisheries of the Indo-Pacific region, pointed out the potentialities of the exploitation of the offshore resources which have not yet been

attempted. Per Sandven (1959) also suggested about the possibilities of rich prawn grounds off the Malabar Coast.

Similarly the lobster fishery of the west coast is restricted to certain localised regions that have a rocky substratum. Along the Kerala Coast only a few species of *Panulirus* are occasionally collected from the rocky coastal areas. Rare catches are sometimes obtained in the trawl nets that fish in the inshore regions. But, here also no attempt has been made for the exploitation of the offshore resources.

The previous works on the deepwater prawns and lobsters off the Indian Coasts are very scanty and these deal only with scattered collections obtained by expedition cruises.

In 1958, the Oceanographic Department of the Kerala University started an investigation of the Bottom Fauna and Bottom Deposits of the offshore regions upto the 200 fathom line working at fixed stations from Mangalore in the north to Puvar in the south. Two species of deepwater prawns — *Panaeopsis philippi* and *P. rectacutus* and two species of lobsters — *Puerulus sewelli* and *Palinustus sp.* were obtained. All except the last species were obtained in fairly large numbers and so a detailed investigation was subsequently carried out for exploring the extent of the grounds. Altogether 150 stations covering an area of about 4800 sq. miles were investigated so far. A 6 ft. beam trawl and a Naturalist's dredge were employed for obtaining the collections. As a result of the above survey, it has been observed that *P. philippi* occurs in large numbers near the 100 fathom line occupying almost a continuous bed, with a maximum intensity between Cochin and Calicut. In the first survey (John & Kurian 1959) it has been found that *P. philippi* occurs along the edge of the continental shelf near the 100 fathom line, where the temperature ranges from 16°C to 20°C and where the bed of the sea is formed of fine sand and silt. But, subsequent surveys have shown a shift in the location of the prawns to deeper regions, more specimens having been collected away from 100 fathoms and upto 180 fathoms. Along with *P. philippi*, another species of the same genus *P. rectacutus* has been observed at a few stations, the latter species being less abundant than the former and occupying deeper stations.

During April 1959, in the beam trawl collections off Vizhingom and Anjengo a few specimens of the spiny lobster *Puerulus sewelli* were obtained from 150 and 110 fathoms respectively. The sea bottom in these regions was found to be rocky. Further observations revealed the presence of the lobster towards the south upto Puvar and north as far as Cochin, often occupying a depth beyond the 100 fathoms line. However, slight changes in the location of the lobster bed was noticed during the subsequent surveys. Anyhow, it is evident that *P. sewelli* occupies a bed beyond the continental shelf and it is generally found in a hard bottom formed of sand with shell fragments or stones and small percentage of silt. The bottom temperature in the region varies from 11°C to 14°C and a dissolved oxygen content as low as 0.71‰. It is interesting to note that Alcock (1901) recorded the type of the species "Off Travancore Coast" almost from the same locality from where it was collected during the present investigation after 60 years. This further substantiates that *P. sewelli* is a more or less permanent inhabitant of the edge of the continental shelf, off the Kerala Coast worthy of attention for detailed investigation. Though the maximum number of specimens obtained in a 10 minutes' haul by the 6ft. beam trawl is only 30 (Off Anjengo, 1960), later off Alleppey at 180 fathoms, more than 50 specimens were obtained in the otter trawl operated at a bottom of fine grey sand with small percentage of silt. From the above survey it may be deduced that *P. sewelli* occupies a rocky as well as sandy ground with small percentage of silt.

An attempt was also made to study the food and feeding habits of a few penaeid prawns. Most of the species feed on what is readily available. Hall (1962) observes that some species select their food with preference for a carnivorous diet, while others feed mainly on vegetable matter. Panikkar and Menon (1956) observe that prawns feed on detritus of both plant and animal origin and along with it large quantities of sand and mud. Hall *loc. cit.* is of the opinion that "detritus" could be considered only as a very minor item of the diet and that penaeidae in general cannot be considered as detritus feeders and that prawns feed on living or dead animals.

Analysis of the gut contents of *Penaeus indicus* and *Metapenaeus dobsoni* collected

from the inshore regions of Kerala, showed remains of crustaceans, foraminifera, diatoms and detritus, the last one being more prominent. On the other hand the gut contents of *P. philippi* and *P. rectacutus* collected from the deep water regions showed a different characteristic. Detritus formed only a very minor part, while the predominant elements were foraminifera, crustacean appendages, Decapod larvae, Isopod and very rarely diatoms and sand grains. This change in the dietary may be due to the difference in habitat. While *Penaeus indicus* and *Metapenaeus dobsoni* occur in the inshore regions at a muddy bottom, *Penaeopsis philippi* and *P. rectacutus* occupy a deep water region having a more or less hard sandy bottom with only a small percentage of silt. The occurrence of *P. phillippi* and *P. rectacutus* in the offshore areas, perhaps may also be due to their special preference for the type of food available in that region besides the hydro-graphical conditions prevailing there.

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