

Cephalopods-

HITHERTO UNEXPLOITED MARINE RESOURCE OF OUR SEAS

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Cephalopods (Kephale = head + podos = foot) are a group of soft bodied animals belonging to the phylum Mollusca. Phylum Mollusca contains many diverse groups of animals. There are about 70,000 living and 25,000 fossil species included in this phylum. Biologically speaking, molluscs are a successful group of animals. They are present both in fresh and saline waters and have invaded land also.

They are important as food items from ancient times. The enormous heaps of shells of molluscs making up the kitchen refuse of many of the stone age people in various parts of the world prove this. Such stone age kitchen refuse of molluscan shells are so large in North Carolina in the U. S. A. that they have long been used as a source of road-building material. The 'royal purple' of the ancient Greeks and Romans was obtained from the pigment secreted by the Mediterranean snail, *Murex*. Huge piles of their shells are seen even now on the shores of Syria and nearby areas. The use of molluscs as food is steadily increasing today. According to the United Nations 'Economic Year Book', the total world catch of molluscs is about 2,000,000 metric tons annually. In ad-

dition to the use as food, many other commercial products like pearl and beautiful shells for ornamental and religious uses are obtained from them. Lime and cement are manufactured from their shells.

Cephalopods which include squids, octopus and *Loligo* are all marine. Presently they are a small group of only about 400 species. But there are fossil records of more than 10,000 cephalopods. This class is the only invertebrate group which contains large dangerous animals on the vertebrate scale of size. The eyes of Cephalopods are intelligent, alert and are very much like human eyes. Each eye has a movable lens to focus on subjects at any distance. No other invertebrate has this ability. Moreover their eyes have iris and pupil just as the human eyes.

The number of squids in the ocean is fantastic. Sometimes ships get false readings from echosounders due to millions of squids suspended between the ship and the sea bottom, feeding on planktonic organisms. Occasionally this layer of squids comes to the surface. Once a ship sailed for about 2 hours through such a sea of squids stretching to the horizon in all directions.

Most of the squids are small-less than 20 cms. long. They constitute one of the most important food items in the ocean. Schools of fishes pass through their shoals and devour them by the millions. Porpoises and killer Whales often swallow them. Most of the squids are cannibalistic. All these factors help to keep their population from over-running the oceans. In several species of squids, biologists have found a giant nerve. It is about 40 times thicker than

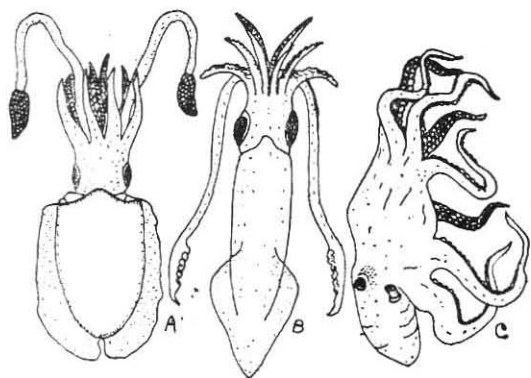


Fig. 1: A. *Sepia*, B. *Loligo*, C. *Octopus*.

the largest nerve used previously for neurological studies. This thicker nerve is now used for research in nerve action, vital body activities and hormones.

The giant squid *Architeuthis* of the North Atlantic attains a body length of 7 meters and has a pair of grasping tentacles over 10 meters in length and eight shorter ones of about 3 meters. Some of the Octopuses attain about 5 meters diameter. The real villains in many of the horror stories about sea serpents are believed to be giant squids. Very little is known about these giants of the deep and some of the species are described only from the semidigested remains which have been taken from the stomachs of sperm whales. Sperm whales are said to have a special taste

for the squids and many of the sperm whales caught shows marks of the squid's suckers on their bodies which indicate the fierce battle they have fought with them.

Based on the plankton collections of the International Indian Ocean Expedition (IIOE) and other surveys made by certain Indian scientists, the cephalopod resources of the Indian seas are enormous. About 65% of the zooplankton collections from all over the Indian Ocean contain cephalopod juveniles. Of all the areas, the Bay of Bengal accommodates their largest nursery in the Indian ocean. This indicates the vast scope for the development of cephalopod fisheries in India. But still they remain to a large extent unexploited. In the Mediterranean regions, Japan, China, Philippines, Far East and in the Pacific ocean islands cephalopods are cherished as delicacies. The worldwide production of cephalopods has increased from 630 thousand tonnes in 1964 to 1,180 thousand tonnes in 1968. The above mentioned countries, during 1970 have imported about 30,300 tonnes of Cephalopods products worth 22.77 million U.S. dollars. This definitely shows the increasing demand of this group of animals as a food. The average annual production of cephalopods in India from 1962 to 1971 is only about 780 tonnes.

Although other groups of molluscs are used as food by a large number of people here, nowhere along the Indian coasts cephalopods form a regular fishery. In most of the places they are incidentally caught in the nets all through the year during the normal fishing operations. *Sepia aculeata*, *Sepio-teuthis arctipinnis*, *Loligo indica*, *L. affinis*, *Octopus herdmanii*, *O. hongkongensis* and *O. rugosus* are some of the common cephalopods used as food. The most important fishery for cephalopods, especially for squids are along the southeastern part of India—along the

Palk Bay and Gulf of Mannar. The main commercial species caught here is *Sepioteuthis arcypinnis*. It has a fairly high demand as food in these parts. They are caught by shore seines and 'Ola Valai' is a special type of seine made of the strips of palm leaves tied along the wing ropes acting as scares to drive the squids into the bag of the net. Most of the catch is consumed locally. Some are dried for export. When the squids are caught, they are split open to remove the 'ink sacs'. This is to avoid the animal's flesh being tainted with its ink. In the open ocean this ink is used for the production of a 'Smoke screen', by which the animal escapes from its enemies. Some deep water squids even have luminous ink to make flares in the water while the darkened owners escape from the predators. It is interesting to note here that this ink taken from *Sepia* was used as a drawing ink even in recent times. It was known to keep clarity and intensity of colour for a long time.

In the markets squids are sorted according to size. Smaller specimens are sold to line-fishermen for using them as baits. For curing, the larger specimens are split with a median ventral cut and left on the beach sands to dry. The viscera and the shell or 'cuttle bone' are also removed in some cases. The cuttle bone is a sort of internal 'skeleton' to these animals and they are very important commercially. Occasionally these bones are washed ashore in large numbers. They are gathered for sale. From Kerala also, a considerable quantity of cuttle bones are sold. During 1972, 23,633 kg. of cuttle bones valued at Rs. 23,172 was exported from India.

Because of the crude method of curing, squids do not attract much attention from foreign markets. It is

to be noted here that, the squid fishery of the Monterey Bay area in California is considered to be a major fishery of the world. Estimates show that in 1946 it brought an annual income of \$ 1,214,091 to the fishermen there.

New methods of hygienic processing, curing and packing of the squids will definitely help us to catch foreign markets. The Integrated Fishery Project (I. F. P.) as a part of their attempts to popularise new fish products has devised a good method of processing the cuttle fishes and squids. According to the I. F. P. method, immediately after capture the edible mantle portion of the animal is separated and washed free of the 'ink' stain. This will give a good appearance to the processed flesh. Separated mantles are very thoroughly washed and kept in crushed ice till they are landed ashore. The iced raw material is washed again in chlorinated water and the external slimy layer is scrapped out with knives. The cuttle bone is removed then. The remaining muscles of the mantle are again thoroughly washed in ice water till they are quite white. Then they are cut into uniform strips or "Fingers" of 2 to 2.5 cm. thickness and sufficient length for packing. The packed 'cuttle fish fingers' are quick frozen in the contact plate freezer at a temperature of -35°C to 40°C . The frozen product can be stored for over 6 months without losing the flavour. These processed 'cuttle fish fingers' contain easily digestible proteins and mineral components. Moreover they do not have any 'fish' odour. They are said to be fine if deep fried with spices and aromatics. There is no doubt that Indian Cephalopod products will command a foreign market if a regular fishery for them is started and strict measures are taken to ensure their processing hygienically. ●

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