

KADALEKUM KANIVUKAL

(Bounties of the Sea)

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Edited by

**K. RAVINDRAN
KRISHNA SRINATH
K.K. KUNJIPALU
V. SASIKUMAR**

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INDIAN MARINE MOLLUSCS

K.K. Appukuttan

Central Marine Fisheries Research Institute

Cochin - 682 014

Molluscs are soft-bodied non-segmented invertebrates, popularly known as shellfish, though not a fish in the strict sense. The soft body of molluscs is protected by an outer casing, usually hard, composed of calcareous material without an internal skeleton. In cephalopods viz. squid, cuttlefish and octopus, an internal skeleton is present. Almost 600 million years back, during Cambrian period, these animals appeared on earth and it was in 1757 that Linnaeus first classified them under molluscs.

Molluscs are highly diversified in shape, colouration, distribution, habitat and utility. Many have two protective valves (bivalves) and some have series of protective plates over the body as in coat-of-mail shells (*Amphineura*). Gastropods have spirally twisted single shell. Elephant tusk shells are provided with tapered tubular shells (*Scaphopoda*) and cephalopods with internal shells as in squid, cuttlefish and octopus and *Nautilus* with external floating shells. The range of distribution of these animals is extensive, as it covers inshore, offshore, intertidal and deepwater areas in sea, estuaries, backwater, fresh water and terrestrial habitats. The molluscs range from tiny bivalve *Bithynia* to the giant clam *Tridacna* which reaches up to one metre in total length. There are also giant squid and octopus. The colouration and design of seashells are unparalleled and highly artistic, some are even polymorphic. The beautiful colour pattern in a variety of nudibranchs could only be compared with that of butterflies.

The molluscs recorded from the world range from 80,000 to 1,00,000, out of which 50,000 are gastropods, 15,000 bivalves, 500 polyplacophora, 400 cephalopods, 130 aplacophora and 5 monoplacophora. There are 31,463 marine, 8,765 fresh water and 24,503 land molluscs reported from different parts of the world.

Apart from the well known utility of molluscs as a source of protein rich food for mankind, shells have had an important

place in social life from time immemorial. The long standing relationship between man and molluscs in India is evidenced by the discovery of shell remains in the human habitation of prevedic Mohenjadarro, Harappa, Amri, Nat, Nundara and Rupar. The remains include cowries and chank shells and also the bangles and cores of shells used for bangle making. There are references to shells such as chanks, pearl oysters and few gastropods in Vedic literature. Sacred chank, *Xancus pyrum*, is often depicted as one of the symbols of God Vishnu and invariably in all Hindu temples chank is used as an essential instrument for daily worship. Sinistral chank, 'Valampuri', a rare variety, is a pride possession of any Hindu temple. The blowing of chank during pooja time is a common sight in all temples. Among the handicrafts of the past, the rings, bangles, plain and carved and disc ornaments made out of chank are most important in the early Indian history. The ink of cuttlefish was used as drawing ink till recently. Right from early days there were brisk trade activities in the Gulf of Mannar and Kathiawar coast for the pearl oysters and chank. Pearls collected from Indian pearl oysters were known as Oriental Pearls. The cowry shells were used in ancient India as currency-money cowry. Many Indian hill tribes, including Nagas were using them as currency till recently, until the introduction of Rupee. A few shells were used as medicine in ancient India. The powdered chank shells mixed with water was considered as an effective medicine for diseases such as rickets and asthma. Chank ointment was used for eye ailment. Other shells used as medicines were cowries, apple snail and window-pane oyster.

The meat of squid, cuttlefish, oyster, mussel and clam is a delicacy, rich in protein with less fat which is easily digestible. Shells of molluscs form material for handicraft, calcium carbide and lime powder industry. A number of molluscs are exploited on commercial basis from inshore, offshore, estuaries, backwaters and rivers of India at sustenance level by the coastal population. As no precise landing data on molluscs from India are available except for cephalopods, we have to depend on the result of various surveys conducted in different parts of the country for estimated total production, especially for mussels, oysters, clams and cockles. The molluscs collected on commercial basis from India are bivalves such as brown mussel, green mussel, common backwater oysters, rock oyster, black clam, Asian hard clam, short neck clam, wedge clam, baby clam,

razor clam, ark-shells, pearl oysters, window-pane-oyster, giant clam and ornamental bivalves. Among gastropods, sacred chank, olive shell, whelks, Andaman top shell, Andaman turban shell, button shell etc, are edible. Cowries, Murex shells, helmet shells, *Tibia* sp., tusk shells etc, are ornamental gastropod shells. Squid, cuttlefish and octopus are all edible cephalopods collected from Indian coasts. *Nautilus argonauta* is an ornamental cephalopod.

Two species of mussels occur along the Indian coast viz., *Perna viridis* and *P. indica*. The total estimated production of mussels from Indian coast is around 10,000 to 15,000 tonnes annually. For edible oysters we do not have a total estimate since the exploitation is done from patchy beds distributed mainly in Kerala, Karnataka and Tamil Nadu estuaries. Eight species of edible oysters are available in India, of which *Crassostrea madrasensis* is very common along southwest and southeast coasts. The present total production is about 2,000 tonnes per year. The total production of clams and cockles together amounts to 65,000 tonnes annually. Mainly 5 species of clams are exploited from Indian waters. The meat of short-neck clam *Paphia malabarica* is exported in good quantities to Japan at present. The window-pane oyster is exploited from Kakinada Bay and the estimated catch is 4,000 tonnes annually. Sacred chank, *Xancus pyrum* is mainly exploited from inshore and deeper waters of Mannar, Gulf of Kutch, southwest coast of India and Andaman seas. The approximate number exploited annually is around one million. The total estimated landing of cephalopod for the year 1988 is 52,627 tonnes of which 60% is contributed by cuttlefish and 70% of the total catch is landed at Kerala, Maharashtra and Gujarat. The present total landings of cephalopod is almost one lakh tonnes. The annual export earnings from cephalopod is roughly Rs. 2500 million.

Among gastropods, whelks (*Babylonis* spp) are exploited in good quantities and are exported from India. About of 300-400 tonnes of whelks are collected from Kerala and Tamil Nadu coast every year and exported to Japan.

The present total marine molluscan landing of the world is 5.27 million tonnes. Our contribution is insignificant but recent research shows that there is ample scope to augment production by intensive fishing, fishing in new areas and also by adopting scientific farming of oysters, mussels and clams.

Among the ornamental molluscs, pearl producing pearl oysters have an important position. Pearl harvest was an age old trade in India and this was done in Gulf of Mannar and Gujarat from time immemorial for collection of natural pearls. By early 1960s pearl fishery in both these areas was stopped due to non-availability of pearl oysters in the natural beds. In early 1970s the Central Marine Fisheries Research Institute initiated pearl culture and the country now has the technology for pearl production on commercial scale.

Nowadays, a few beautiful sea shells in the showcases have become a status symbol and pride for any Indian house. Articles made of shells have become added attraction and varieties of them are readily available in the market. The VIP garlands made of periwinkles, window-pane oysters, cowries and conus shells are costly handicraft items made exclusively for special occasions. Eeve chains, necklaces and chains with pendants are made using shells of whelks, periwinkles, button shells, cowries and a variety of beautiful gastropods. In most of the tourist centres in south India there are several shops exclusively selling these shell articles. Beads and carved pieces of sacred chank, beggar's bowl, *Nautilus*, trochus and turbo are now used for making necklaces, buttons and rings. Earring, rings and studs made out of top shells, turban shells and chank have very good demand. Chank bangle trade is age old and chank bangles are still in great demand in Bengal. Table lamps made out of top shells, turban shells, *Nautilus*, *Murex* and beggar's bowl are costly handicraft items. A number of gastropods and bivalves are used for making "bathi"-stand, ashtrays, key chains, lockets for jewellery, milk feeders for babies, replica of monuments and mansions, portraits of saints and a variety of toys. The tusk shells are used for making window and door curtains. Since the ornaments made of shells are becoming a fashion among the present generation there is every chance of increased demand for the shell articles and consequent development of shell handicraft industry.

The Central Marine Fisheries Research Institute through constant research efforts have studied the resource characteristics of Indian marine molluscs and developed viable technologies for production of pearl, mussel, edible oyster and clam in inshore waters and estuaries. Increased production

of squid, cuttlefish, mussel, oyster, clam, pearl oyster and other edible and ornamental bivalves and gastropods through organised fishing and also by adopting viable farming techniques should be our ultimate aim to achieve the export target as well as to meet the local demand for molluscan products.