FISHERY STATUS OF CHICOREUS RAMOSUS
ALONG THE SOUTHEASTERN COAST OF INDIA

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INTRODUCTION

From very early times mankind have used molluscs for food, their shells for ornaments, as utensils, and for making lime. At present molluscan shells are used to make articles of various shapes, such as pendants for ears, beads for chains, pins for hair, flowers, dolls and items presented as a gift (Natarajan and Thiagarajan, 1979). The economic value gained by the molluscan shells has led to the development of molluscan fishery in different parts of India. This fishery is also contributing to some extent to the country’s economy, in addition to providing employment opportunities through shell fishing and shell craft industry. Indian molluscan shell-fishing industry is confined to limited places like the Gulf of Mannar, the coastal environs of Cuddalore, the West Bengal, Bombay and the Andaman and Nicobar Islands. The fishermen, of the above mentioned areas which are abound in bivalves and gastropods, are responsible for the growth of the molluscan fishery. Their fishing target is oriented to economic value and the abundance in the area of particular species. The important species responsible for the growth and development of the shell fishing industry are Xancus pyrum (Nagappan Nayar and Mahadevan, 1974) Trochus and Turbo (Appukuttan, 1977). Though many other molluscan species also constitute the fishery in different coastal areas, the information available on them is very limited. Hence studies were made of Chicoreus ramosus, an economically important muricid gastropod exploited for purposes like making lime, decorative pieces, and for the value of its operculum.

Description of Chicoreus ramosus

Chicoreus ramosus is locally known as the "Elephant snail." It comes under the class Gastropoda, order Neogastropoda and family Muricidae, and is commonly termed as the "Branched Murex". It is the largest species of its genus. The shells are quite large, thick and brownish-white in colour, and circled with fine brown lines, but their colour may vary from habitat to habitat. If the habitation of C. ramosus is a place within the luxuriant bed of seaweeds of a coral reef the shell aperture turns out to be bright rosy in colour. Normally C. ramosus occur in littoral rocky areas especially on and in the vicinity of the coral reefs, at the depth of 8 to 24 m and grow to a maximum size of about 30 cm length. The peculiar feature of this gastropod is that the three varices bear rows of recurving spiny fronds and elaborate ornamentation; the aperture is large and oval, rimmed with rose pink and white in the interior, columella smooth and the siphonal canal broad. The operculum is horny in nature with a basal nucleus. This species is found in the Indian ocean, the Red sea, the Central Pacific Islands, Australia and China. In India, this species is well represented in places on the eastern Indian peninsula viz. the Gulf of Mannar, Poompuhar, Nagapattinam, Cuddalore, Madras, the waters around Lakshadweep and Andaman & Nicobar Islands.

Fishing

Because of its nature of coral inhabi-
tance its fishing is also restricted to places in and
around the waters of the coral reef. There is no special gears or traps for *C. ramosus* fishing. The entire catch is a by-catch mainly from the commonly existing fishing methods like lobster and trawl netting and also from skin diving.

**Lobster Netting**

The lobster fishing is carried out by a special type of gear called the lobster net which consists of 5 to 8 separate units of nylon nets, linked by rope. A single unit is about 225 metre in length with the mesh size between 6 and 8 inches. The fishermen engaged in lobster fishing spread their nets in the early hours of the day in coral habitats and leave them in location for one or two days. Some *C. ramosus* entagle themselves in the nets and they are then caught along with the lobster. *C. ramosus* fished by the use of lobster nets are above eight cm in total length. In the Gulf of Mannar area lobster fishing is carried out through all the months of the year and hence, the availability of these shells are satisfactory throughout the year.

**Trawling**

In areas around places like Cuddalore, Nagapattinam and Poompuhar, a few *C. ramosus* shells were fished during trawling operations. The quantum of their catch is less when compared with those from lobster nets, because the trawling operations are carried out mostly in non rocky or non coral areas.

**Skin Diving**

Diving is a characteristic method of fishing in the Gulf of Mannar area. During the post monsoon period (January-March) the water in the Gulf of Mannar area is very calm and clear; due to greater penetration of light, the condition is more suitable for skin divers to collect the commercially important benthic fauna like sea cucumbers, seaweeds, lobster and sacred chank and other commercially valuable organisms. In this area the divers go for the collection of *C. ramosus* when fin fishes are scarce. *C. ramosus* has been found to breed and spawn in the late premonsoon to postmonsoon seasons and are therefore abundant in the postmonsoon season. Communal spawning which is a phenomenon peculiar to *C. ramosus* leads to their aggregation in a particular area which makes it easier for the diver to collect more animals within a short period of time. These assemblages of *C. ramosus* could easily be located by a diver as they appear like a small mountain, rose in colour. In the Gulf of Mannar area the divers go down to a depth of up to 25 m.

Fouling organisms like barnacles, bivalves, tubiculous polychaetes and seaweeds are commonly found associated on the surface of *C. ramosus* shells and encrustation of calcareous algae is also a common phenomenon. Due to the encrustation of calcified algae, the recurring spines of the shells lose their original shape and structure in course of time. In addition to these fouling organisms shell boring organisms like sponges, bivalves and polychaetes cause considerable damage by boring into the shells. *C. ramosus* shells of a larger size are mostly wormed compared to those of a smaller size. Generally, animals below the size of 10 cm in length are free from worming.

**Processing of *Chicoreus ramosus* Shells**

The naturally collected shells are normally dull in colour, and found to have various unwanted associated animals on their surface and they are encrusted with calcareous algae. Therefore, the shells collected have to be processed before being marketed for ornamental purposes. The processing of *C. ramosus* shells consists of the following steps. The raw shells are dumped in the godowns of the shell merchants or those owned by the shell craft industry. The soft parts of the shell are taken out either by boiling them or by pit curing and associated animals like the barnacles and bivalves are scraped/cut off from the shell using scalpels or small knives. The surface of the shell is then cleaned using a circular iron wheel driven by an electrical motor. This type of cleaning effectively removes the
minute fouling organisms like bryozoans and dust found in between the circular lines of the shells. Once the surface is cleaned, the shells are dipped in dilute hydrochloric acid (HCl) for some time. The time and the strength of the acid treatment depends on the size and thickness of the shells. After completion of the acid treatment the shells are kept in caustic soda water for some time because caustic soda is the most effective agent for removing calcareous fouling on the shell. The shells appear bright and polished when they come out of the caustic soda treatment.

**Economic Value of Chicoreus ramosus**

The *C. ramosus* shells are mainly collected for their operculum, lime making and for their value as ornamental pieces. Enquiry with agents collecting operculum revealed that the operculum is used as one of the raw materials (binding substances) in the preparation of incense sticks and also in the preparation of perfumes and medicines. However, the actual purpose for which they are purchased is not known. According to Fretter and Graham (1962), the operculum of gastropods is composed of conchiolin. Based on histochemical studies of the *Gibbula meus* operculum, Vovell's (1967) observed that the operculum is composed of layers of quinone-tanned protein resulting from a process of secretion containing a protein with aromatic residues, a polyphenol and polyphenol oxidase. Probably it is the presence of such aromatic compounds that has led to its use in the preparation of perfumes. However, no authentic evidence is available regarding this particular aspect of its use. The average length and width of the operculum of *C. ramosus* is from 1.83 cm to 8.33 cm and 1.45 cm to 5.85 cm respectively. The average cost of one kilogram of operculum is Rs. 900. Generally, the operculum is collected from the fishermen by various agents; the agents generally advance a sum of money to the fisherman who in turn will supply/sell the operculum only to that particular agent. Whenever a fisherman needs money for getting his boat or gear repaired or for purchasing fishing equipment, he will approach agents to get an advance against the promised supply of operculum. Apart from the operculum, the unwormed shells are used for ornamental purposes and the wormed ones are mostly used for making lime and as material for foundation in building constructions in the coastal areas. Of significance in *C. ramosus* fishery is the fact that very recently some agents have started collecting the soft parts particularly the foot portion of the animal. The value of one kilogram of *Chicoreus ramosus* meat is about Rs. 30 to Rs. 35. The meat of *Chicoreus ramosus* is nowadays exported to various Southeast Asian countries such as the Philippines and Singapore and also to Sri Lanka.

**Statistical Information**

There is no organized or regular fishery for *C. ramosus* and the entire catch is only by-catch. Further the agents making collections of the operculum are the source of information and they are reluctant to provide data because dealings in operculum are still shrouded in mystery and the actual fate of the operculum is not known after it gets out of the hands of the fishermen. However, based on estimates made by our field survey and the interviews with fishermen and shell traders we could get an approximate idea of the landed quantity of *C. ramosus* in a year through lobster net, diving and trawl net. During the period from April 1991 to March 1992 the estimate is 483 tonnes.

**CONCLUSION**

Though *C. ramosus* fishery constitutes an important part of the shellfish fishery, the absence of skill in fishing is the main reason for the lack of improvement in its fishery. To improve the fishery and to fully utilize and exploit the resources, integrated steps should be taken immediately by all the people engaged in the shell fishing industry from the fishermen to the agents of commerce at different levels. Hence, the following suggestions are being made.
1. A complete and detailed survey of *C. ramosus* beds in coral reef habitats would help explore the possibilities for the further expansion of its fishing.

2. It is imperative that the Government should take steps to find out the potential of this fishery resource and introduce management of this molluscan fishery.

3. The Government should encourage fishermen providing them with adequate facilities for regular *C. ramosus* fishing so that the increasing demand for their supply is met.

**REFERENCES**


