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Marine Mollusc is an Excellent Ornament

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Abstract: The demand for the molluscan shells and shell products mostly those with beautiful shape and colours is rapidly increasing. Besides being used as raw material for many calcium carbonates based industries and domestic applications they are also used in exquisite handicrafts in consequence many small scale industries started along the coastal areas. Using the methods of skin diving and hand picking, shells were collected from wild and after attempting different steps of cleaning, shaping and polishing finally it become ornaments. The aim of the present investigation was made to lay the foundation for preparing traditional Indian ornaments using molluscan shells with modern techniques through which the structural design can be made to reflect tradition and fast development of ornamental industries without damaging the natural environment.

Key words: Gastropod, ornaments, traditional, Gulf of Mannar, resources, India

INTRODUCTION

Gulf of Mannar is the richest source of marine molluscs which is situated in the south east coast of India. From the time immemorial, man involved in exploit and explore of the marine molluscs as a source of ornaments, industrial purpose, medicine and little as food. Like any commercial food, it is necessary that molluscs present good quality standards, concerning some criteria such as amount of meat and appearance (Nishida *et al*., 2006). Shell collecting as a hobby reached a peak of popularity in the 9th century when many extensive collections were built up. Currently shell collecting is again in vogue not only with specialists and amateur conchologists but also with tourists and Souvenir hunters. Shell jewellery, lampshades and other shell craft articles have also suddenly become popular, probably as part of the trend away from plastics and synthetics towards natural materials. The sudden escalation in trade has given rise to concern among conservationists and biologists since large scale collection of species hitherto collected in only small numbers is occurring in many parts of the world.

Unfortunately very few data are available on the quantities being taken or on the ecology of the species concerned. It is therefore, very difficult to estimate the effect of exploitation on populations (Wells and IUCN Conservation Monitoring Centre, 1981). Skin diving and hand picking are the major techniques used to harvest the gastropods from wild. Few people of the coastal areas and villages are either temporarily or permanently depending on marine ornamental gastropods for his/her business but still they practice the old and ancient techniques for making varieties of eye catching objects. With few chemicals and very few instruments, the shell workers along the coastal areas of Tuticorin by using traditional as well as modern techniques to make a diverse range of ornaments including chains, momentous, light, clock, beads, pendants and bracelets, etc.

The majority of shell ornaments are made/prepared either unfinished or broken shell materials. Only in the case of momentous and clock like big things they are using undamaged shells. Likewise most of the other shells recovered were chipping debris and discarded pieces, the bi product of the manufacturing process. The main view of this study is to collect the general information on gastropod fishery, methods of ornament preparation, trades, marketing and products by documenting survey on traditional practitioners of making ornaments near coastal areas of Tuticorin, Kanyakumari and Rameswaram.

MATERIALS AND METHODS

A number of specific fishing techniques are used to collect ornamental gastropods from wild. For making ornaments, samples were mainly collected from by catch of different types of nets used to catch the fish, shrimp,

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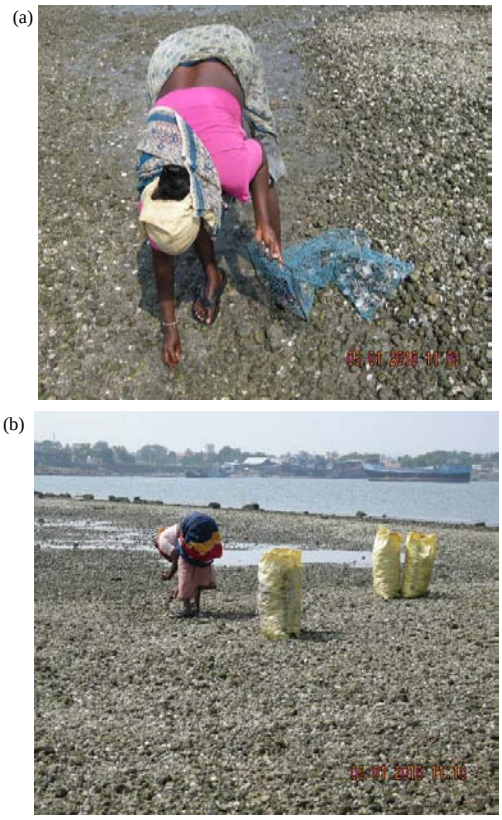


Fig. 1: Collection of gastropods near coastal areas of Tuticorin

Fig. 2: Gastropod shells in shore area (Godowns)

crab as well as skin diving and hand picking. Collected samples are kept for removing soft body part by three general methods are Burial, Boiling and Sun drying. After removing the soft parts the shells are kept in acid for cleaning.

A weak and thin shell which is not good for making ornament will damage while doing acid wash to remove stains, unwanted colour and extra attachments. Damaged thin shells after acid wash are removed and remaining is used for further shaping. During shaping again some of the damaged thin shells are removed. Finally, thick as well as undamaged shells are using for making ornaments.

Collection and storage: The collection was made from the Gulf of Mannar situated at lat. 8°47-9°15'N and long 78°12-79°14'E. Skin diving and hand picking is the major technique used for harvesting the gastropods from wild but majority comes from by catch of different types of nets used for catching of fish, shrimp and crabs. However, not only the traders are involved in collecting shells from the source but they also employ the poor people of nearby coastal village (Fig. 1a and b). Molluscan shells are easily collected from the entire coastal area of southeast coast of India and sold to the traders very chiefly where trader are shelling on higher cost depending on the quality of shells. Edible species of oysters, mussels, cockles and gastropods are collected extensively for local consumption usually by the families of local fisherman (Ronnback, 1999). Mollusc has been exploited by man for a wide variety of purposes since prehistoric times. Food has probably always been the most important use, marine species having been gathering for centuries by coastal peoples to provide a major part of protein in their diet. Currently, commercial fishing and cultivation of clams, oysters, mussels and scallops is a multi-million dollar industry. Since molluscan shells are composed mainly of calcium carbonate they have had a number of industrial uses. Ground shells produce the finest lime which is used in pottery glazes, toothpaste and poultry food additives either dead or alive; they may be used for a number of industrial purposes such as road construction and building foundations (Wells and IUCN Conservation Monitoring Centre, 1981). After each day catch has been sorted and the divers paid, the piles of shells are transferred to godowns (storage sheds) (Fig. 2a and b) until the end of the fishing season (Heppell, 2001). Gastropod shells are generally stored inside the godowns for long period of time without deterioration of its quality in huge quantity because molluscan fishery mainly comes

during the lean period of fishing or ban on the fishing during breeding seasons. However, some fisherman totally involves themselves in collecting the animals throughout the year.

Preservation: Three techniques are commonly used for removing soft part of the animals from past, firstly keeping all the animals in open environment where insects, worms and flies play major role to decay the soft part of the animals.

Second the whole animals are buried in earth especially for getting shinning and glossy shells. Finally, the whole animals are boiled in oil and during this period soft part is loosed and is removed by the scalp after boiling.

Thereafter, shells are kept for sun drying to remove the pungent odour and then shells are sorted out and stocked. Small and damaged shells are sold out to the industry like lime factories. Lime is used for white washing and in the preparation of various types of tobacco products (viz., Gudakhu, Nasa and Khoini), kumkum, cement, bleaching powder and traditional tribal medicine (Panda and Misra, 2007). Where as big as well as damaged shells are kept for further use. The animal's viscera are left in the shell to rot out but the foot and head are carried to for preparing food.

Cleaning: The shells are very effectively cleaned out by armies of fly maggots before being packed into sacks and sold (Heppell, 2001). Shells are washed in commercial acid (H_2SO_4 or HCl) in different concentration for 2-5 min depending upon species, size and thickness of the shell (Fig. 3a and b).

They are also used ion scrubber to remove hard skin of the big shell along with acid wash. During this process some weak shell get damaged and sorted out again. Polishing is the next step for making shiny and attractive shells.

Shaping and polishing: Shaping and polishing are very tedious process which comes only through experience and play a vital role in making eye catching objects. These are not only depending on the shape, size and species of shell but also on the demand of market and customer. The demand at home and abroad for polished shells and hand-crafted products encourages entrepreneurs in south India who have established several cottage industries producing beautiful curios and several utilitarian objects with molluscan shells (Appukuttan and Ramadoss, 2000). The richly carved and highly chank bangles are traditionally worn by the woman (Nayar and Mahadevan, 1974). For shaping and polishing they use electric motor

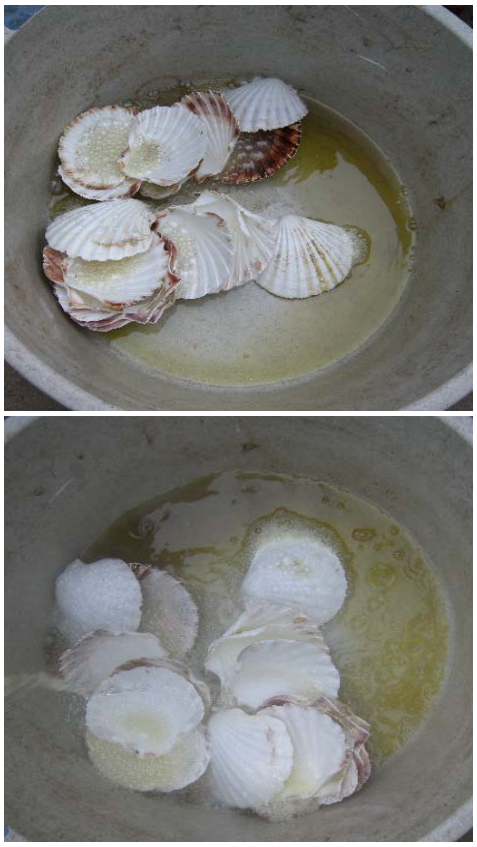


Fig. 3: Shells during acid wash

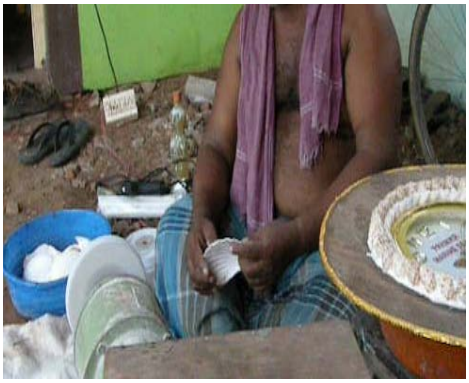
and wheels and are selected on the basis of thickness of the shell (Fig. 4a and b). Mainly they are using three types of wheels each having different thickness, diameter and surface area.

Making ornaments: The wearing of gastropod ornament by all kind of people is now confined to all over the world. The complex gastropod structure must be reduced to an approximate required shape based in which ornament going to make using cutter (Fig. 5).

These broken pieces are then making as ornaments with glue and different colours based on customers need. Cutting and making of ornament is the most highly skilled part of the process.

Marketing: The demand of molluscan shells and shell products mostly those with beautiful shape and colour is rapidly increasing day by day (Edward and Ayyakannu, 1992a, b). A lot of small scale industries along the coastal areas are involve to produce calcium carbonate for domestic purpose by using mollusc as a raw materials besides being used in exquisite crafts as well as home decorating articles in shell shop (Fig. 6) such as lamp

(a)



(b)

Fig. 4: Shaping of shells

Fig. 5: Measuring the required size during shaping

shades (Fig. 7 and 8), pen stands, clocks (Fig. 9), photo frames, paper weights, key chains (Fig. 10) and toys and also ornamental products for ladies such as ear rings, rings, combs, hair clips, bangles and chains (Fig. 11), etc. In some cases like holly chank and big sized shell people like simple polished shell for keeping showcase (Fig. 12-14).

The chank shells are used extensively in making bangles. In India, the chank shell is undoubtedly the most important one in terms of abundance, exploitation and

Fig. 6: Shell shop at Danuskodi

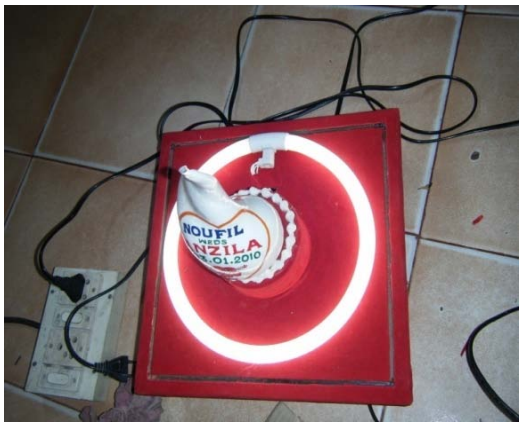


Fig. 7: Preparation of lamp using chank shell

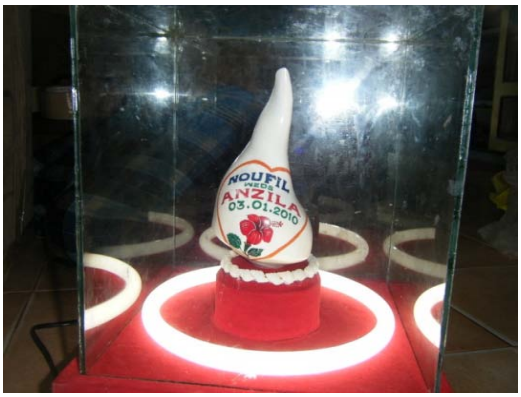


Fig. 8: Prepared chank lamp

economic value among all the gastropods. The present state of the chank industry in bengal is said to be dull because of the short supply of raw materials and due to high labour charged perhaps the industry can be revitalized by increased exploitation of chank resources

Fig. 9: Clock made of different shells

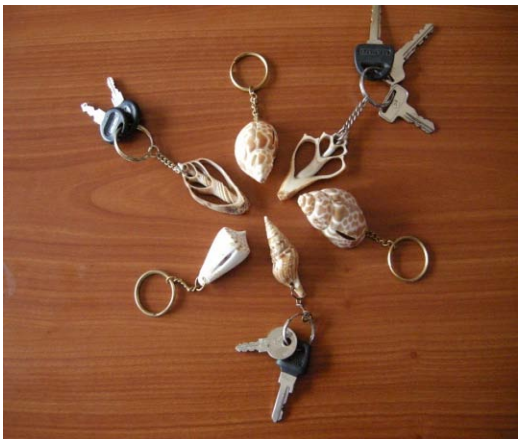


Fig. 10: Key chains of gastropods

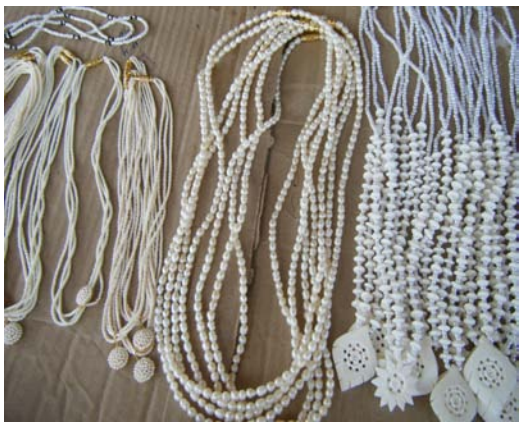


Fig. 11: Chains from chank

Fig. 12: Polished shell

Fig. 13: Group of polished shells

Fig. 14: Gifts/paper weight from *Cypraea* sp.

and supplying the market with larger quantities of chanks (Nayar and Mahadevan, 1974). The important shells in the market are *Fasciolaria trapezium*, *Chicoreus ramosus*, *Hemifusus pugilinus*, *Xancus pyrum*, *conus* sp., *Murex brunneus*, *Vasum turbinellum*, *Babylonia* sp., *Pterocas lambis* and *Donax* sp. During the study period, interview was conducted in coastal villages along the south east coast of India and mainly seven traders were interviewed at Tuticorin, five from Rameswaram and three from Kanyakumari, respectively. Based on their experience there is conclude some valuable points in this study.

RESULTS AND DISCUSSION

India has a total heritage of 3271 species of molluscs belonging to 220 families and 591 genera including about 1900 species of gastropods (Appukuttan, 1996). Out of 1900 species of gastropods catalogued from Indian waters, only 15 species are edible while a large numbers are commercially important ornamental/curios shells in handicraft trade (Appukuttan and Ramadoss, 2000). Mollusks are abundant and hence important in food chains in marine habitats.

Among which the marine gastropods are most commercially attractive and important world wide. Widespread depletion of this commercially important species of marine gastropods has led to increasing interest in enhancement and restoration of wild populations (Maran, 2000). Since chank fishing in Tamil Nadu is carried out by divers working from canoes with no more apparatus than a face mask, a diving stone and a nylon rope bag into which the chanks are gathered, some of the divers could catch the animals according to the size fixed by the government. This is due to lack of knowledge or awareness which leads to reduce the number and size of the population of most valuable species because they are not allowed even a single time for spawning in life (Narasimham, 2005). Not only ornaments, in olden day's molluscs were used in architect to built buildings, temples and Statues, etc. In coastal areas most of the buildings were constructed by corals and other associated gastropods because of the cheap and huge availability and also easy transportation.

In India, information about the molluscan resource and its exploitation is useful for fishing and sea ranching. The intensive trawling over the molluscan beds may lead to large scale destruction of egg mass and juveniles of economically valuable molluscs. Because of the commercial importance and demand in the market, conservation of marine mollusc, sea ranching and sea farming are worth attempting. Regulation to avoid trawling and a mesh size to prevent exploitation of undersized animals are to be implemented to conserve this resource. In this study based on the survey researchers conclude hatchery production and sea ranching of the seeds can help in increasing the natural stock. So, it is important to develop new technology for large scale production, training and transfer of technology programmes need to create an awareness of the importance of the molluscs in the economy of the country.

CONCLUSION

As researchers have seen the marine molluscs are commercially and economically important world wide are found to be abundant in Gulf of Mannar coastal waters and have high demand in Indian as well as foreign markets. The meat is used as food and cosmetic the shell has many industrial uses of making ornaments. People have been exploiting these invertebrate resources for thousands of years. The shell workers at the coastal villages of Rameswaram, Tuticorin and Kanyakumari are following traditional as well as modern techniques for making molluscan ornaments include lamps, lamp shades, beads, fantasy flowers, bangles, flower vases and sculptures, etc. Because of the high value in market, the exploit and explore of molluscan resource is increasing day by day.

This would result, decrease the amount in nature. Studies related to breeding biology, spawning and larval development are essential for developing techniques for mass production of larvae. Unfortunately there is very limited literature in development of hatchery techniques, care should be taken to improve and develop techniques for to produce the resource in mass.

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