

# Methods of Shell Cleaning and Polishing

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From very early time in the history of mankind molluscan shells have been used for various purposes. Primitive man who lived in the cave used shells as ornaments, vessels and weapons. Ancient tribes used conch and triton shells as trumpets to summon people. At the present time beautiful sea shells are worked into various shapes such as pendants for ears, beads for chains, pins for hair, flowers, dolls and gifts. Whether shells are collected to represent scientific collections or for creative arts, a thorough knowledge of different methods of shell cleaning is quite indispensable for shell collectors. The beauty and value of shells depend largely on the manner in which they are cleaned and presented. Unless shells are cleaned thoroughly by a suitable method, the soft parts of the shell will deteriorate and produce offensive odour. Most of the amateur and some professional shell collectors still use crude methods to clean sea shells and in the process damage the natural beauty of the shells, making them unattractive and useless. Valuable shells are cleaned by many indiscriminately with strong chemicals and commercial bleaching agents which damage their glossy surface and spoils their beauty. Therefore an attempt has been made here to describe and present in a consolidated form the

various methods of shell cleaning and polishing so that it will be a useful guide to those interested.

## BURYING METHOD :

Burying the shells near ant hills is an effective method for cleaning shells which have no operculum or do not retract it. Ants clean out flesh in a few days. This method can be adopted only when the shells are not required for immediate use. Shells may also be buried in soft, dry sand where the flesh is allowed to rot for several weeks. The entire organic part of the specimen gets decomposed by microbes leaving the essential inorganic part of the specimen with its natural beauty. Then the shells are collected and cleaned with a strong water jet which flushes the residues. They are cleaned in warm, soap water to remove stains and superficial dirt finally.

## HANGING METHOD:

This method could be used for cleaning most of the medium and big sized Gastropods. Some heavy snails may be hung alive by a string round the muscular foot portion and hanging from an overhead tree branch. The weight of the shell will gradually pull the snail free in a day or so (Abbott, 1968). The shell is then cleaned under

water tap to dislodge dead remnants.

#### SUN DRYING METHOD:

The Gastropod shells are placed outside on the ground after removing the operculum, aperture up-shaded from direct sunlight. Flies lay their eggs inside the shell. The eggs hatch into maggots which eat the soft parts of the mollusc while other insects play a part in the cleaning of the shell. This process will leave a beautiful lustre to the shells. Any remaining soft parts inside the shell are squirted out with water from a hose.

#### REFRIGERATION METHOD:

This method is advisable to clean shells free of calcareous encrustations, richly coloured species and those with thin shells. The specimens are wrapped in a paper towel, placed in a plastic container and frozen or retained for 72 hours in refrigerator. The soft parts will shrink and muscles attaching the body of the animal to the shell are partially or fully detached. The shell is then washed in cold water and all the dirt, both internal and external, are brushed off. Species of Cypraeidae, Strombidae, Tonnidae, Fasciolaridae, Fusinidae, Olividae, and Conidae are effectively cleaned by the freezing method. This process is recommended for cleaning tropical shells (Bergeron, 1966).

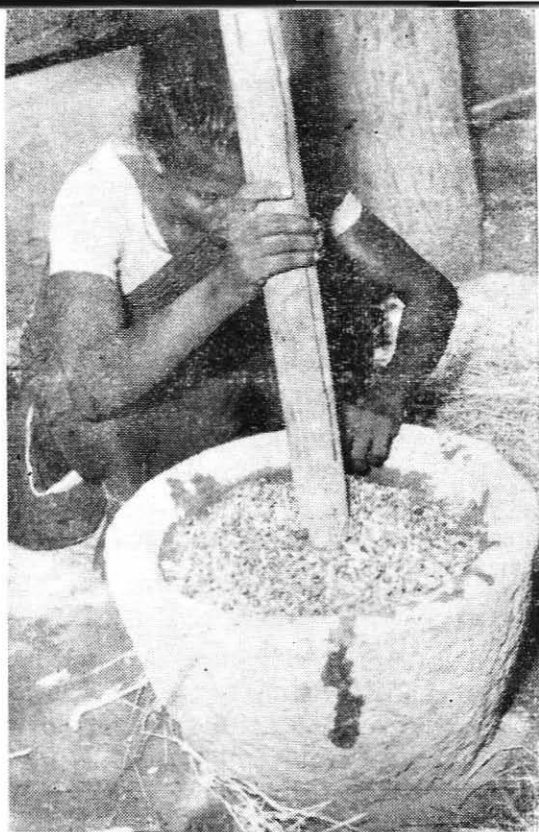
#### BOILING METHOD:

This process can be adopted only if care is taken to regulate the length of boiling time relative to the size of the shell (Bergeron, 1966). Small and thin shells should not be subjected to prolonged boiling lest shells lose color and beauty. Shells which have a highly glossy or enamelled finish should never be thrown directly into

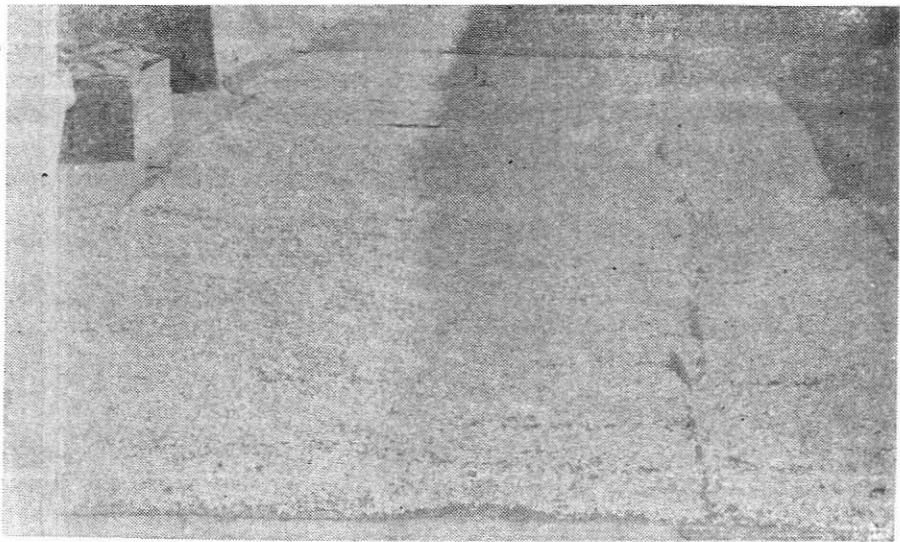
boiling water. They are first put in warm water and then the water temperature is slowly raised to boiling point. After boiling the shell for a required period the water is allowed to cool gradually. If the shells are allowed to cool, the soft parts of the animal are more difficult to remove; sudden cooling also will crack the polished surface. The soft parts are removed with a mounted needle and the calcareous deposits are chipped off with a blunt pointed instrument. Other residues in the shells are rinsed out under the tap. Any amount of decayed soft parts left in the shell may be removed by immersing the shell for 12 hours in a mild solution of 2-5% caustic soda. The aperture and outersurface of the shells are cleaned with a tooth brush. This method can be used to clean the species of Xenophoridae, Tonnidae, Thaidae, and Terebridae.

#### FORMALIN METHOD:

This is the most suitable method to clean specimens to be represented in scientific collections requiring operculum to be kept in tact. Formalin solution effectively prevents bacterial decomposition and hardens the soft parts of the animal. If 40% formalin is directly used, the shell becomes brittle, loses colour and often breaks into pieces in a few months. The teaching effect of pure formalin on the shell being high 5% formalin will be suitable for cleaning. The formalin solution itself being weakly acidic, it should be buffered by adding backing soda (Sodium bicarbonate); borax also can be used instead as a neutralizer. Specimens should be kept approximately for 48 hours in the above neutralized solution. Shells should preferably be washed and brushed of all superficial



Dove Shells (*Pyrene* spp) being polished by pounding in mortars



Sun-drying of Dove shells

coatings prior to keeping in the formalin solution. Then shells are dried on paper. The shells are now ready for display. Almost all the specimens could be cleaned by this method. If it is so desired, the soft parts could be removed at first using forceps and then the shell preserved by formalin method, as stated above.

#### WASH-UP WITH WATER:

This method could be used for cleaning gastropods as well as bivalves; but it is a time-consuming method. In this method the marine shells are placed in a jar of freshwater. Due to osmotic stress, the animal will die and soft parts gradually decay. Every time the water is changed, some of the decayed parts will float on the stale water. When bivalves of small size are left overnight in water, the shells open and the soft parts of the animals could be removed easily (Krauss, 1965).

#### CLEANING METHOD IN VOGUE IN SHELL INDUSTRIES IN MANDAPAM AREA:

Different species of ornamental shells in large quantities are cleaned in shell industries, adopting simple methods so as to reduce the expenditure on shell cleaning. Shells, irrespective of the size, are left to decay in open air. They are kept in small cement tanks filled with water. This facilitates decaying of the soft parts of the shells. The stale water and decayed soft parts are siphoned out and freshwater is added periodically. Each and every shell is washed and rinsed carefully. The grime and other calcareous encrustations of shells are scraped off with a scalpal. The shells are later washed in hot water with a small quantity of hydrochloric acid added to it.

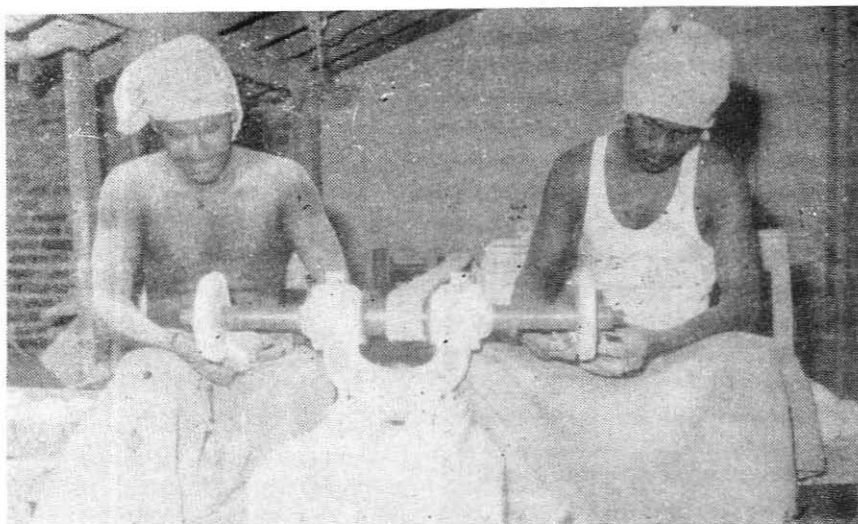
This process makes the shells appear bright and glossy.

Caustic soda or lye is the most effective agent for removing calcareous castings from shells. Lye is a mixture of sodium hydroxide and sodium carbonate. One litre of lye is dissolved in two litres of water and the mixture is allowed to cool for 24 hours. The shells are kept immersed in the lye solution for 12 hours. The shells are taken out and the calcareous encrustations are chipped off and other residues and dirt are brushed off.

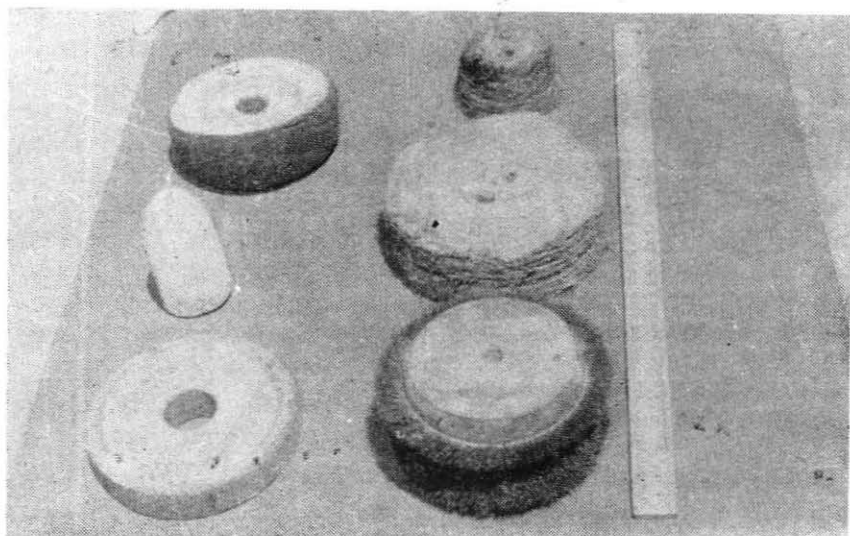
Any difficulty in removing the calcareous encrustations and other residues, is overcome by treating with hydrochloric acid, but one must find by experience the strength of the acid to be used, the time of immersion and suitable temperature of the liquid for each type of shell. If the shells are thick, they are kept in 1 N. hydrochloric acid for 2 minutes and if the shells are thin in 0.5 N. HCl for 2 minutes.

After the ornamental shells are cleaned, they are polished, beautified and defects like pores or cracks are masked. Usually soap or wax is used to give the shells normal appearance. Contrasting coloured soap or wax is not used lest the masked areas become visible.

To polish shells of *Conus*, *Cypraea*, *Oliva*, *Voluta*, *Harpa*, *Cymatium*, *Fusinus*, *Babylonia*, *Rapana*, *Ficus*, *Tonna*, *Cassis*, *Phyllium*, *strombus*, and *Diadora*, they are kept in hot water and a little quantity of concentrated hydrochloric acid is added. The amount of HCl, and time of immersion varies from one species to the other and the number of shells polished at a time. These are learnt only by experience.



Grinding and polishing of sacred chanks



Different types of grinding wheels used for polishing shells

S Small shells like dove shells (*Pyrena*) which are used to make garlands are polished by pounding in country mortars as it is not possible to clean the shell individually. In this process, a few of them go waste, being broken. After pounding, the shells are cleaned in water and transferred to a tank containing hot water mixed with small quantity of concentrated HCl. After a few minutes the shells are removed to be sun dried. This process imparts beautiful lustre to shells.

Grime and periostracum of big shells like sacred chank, turban shell, top shell etc. are abraded in shell industries with the help of carborundum grinding wheel. The rough surface of the shells is also smoothed in this process. With the help of a grinding wheel covered with wire brush the grime settled in the fissures of shell is removed and polishing soap is applied to the shells. Grinding wheel made of muff does the final work of polishing. The shells of *Turbo*, *Trochus* and *Xancus* are polished using the above method.

#### GENERAL REMARKS

In recent years there has been an increase in the production of ornamental molluscan sea shells in India (Jones, 1970, Rao, 1974). There are a number of companies selling ornamental shell products like table lamps, dolls, garlands etc., in various coastal cities and towns. Polished molluscan sea shells like *Conus*, *Cypraea*, *Oliva*, *Voluta*, *Harpæ*, *Cymatium*, *Fusinus*, *Bæbylonia*, *Rapana*, *Ficus*, *Tonna*, *Cassis*, *Phalium*, *Strombus*, *Turbo*, *Trochus* and *Diadora* are also exported to European countries, U. S. A. etc. in large quantities, which bring valuable foreign exchange to our country. In this context, knowledge of appropriate methods of cleaning

and polishing of sea shells is of great importance. Adopting suitable methods of shell cleaning and polishing will result in marked improvement in the quality of the shells for sale in our country or for export which will in turn lead to increased sales and good prices for the shells.

## REFERENCES

1. ABBOT. R. TURCKER. 1968.  
Sea shells of North America  
Golden Press. Inc., New York
2. BERGERON, EUGENE. 1966.  
How to clean Sea shells.  
Marine Biological Research  
Association, Balboa, Canal  
Zone. 1—19.
3. JONES. S. 1970.  
The molluscan fishery resour-  
ces of India *Symp. on  
mollusca.*, Mar. Bia, Ass. of  
India. 906—918.
4. KRAUSS, HELEN. 1965.  
Shell art, Hearthside Press,  
New York.
5. RAO, K. SATYANARAYANA, 1974:  
Other commercial molluscs.  
Bulletin No. 25. C. M. F. R.  
Institute: 141—156.
6. RAO, K. VIRABHADRA, 1969.  
Molluscs have many uses,  
*Indian Farming*, 29 (9):  
41—45.
7. ZEIGLER, F. ROWLAND AND  
HUMBERT. C. PORRECA. 1969.  
*Olive shells of the World.*,  
Rochester Polychome Press,  
New York: 1—96. ●