

## Artful Seashells: The Role of Gastropods in India's Handicrafts and Culture

Vignesh K.\* and Raahavi M.

TNJFU-Dr.MGR. Fisheries College and Research Institute, Thalainayeru, Nagapattinam, Tamil Nadu

### SUMMARY

Seashells have captivated humans for centuries, adorning our homes, jewellery, and stories. But behind their beauty lies a fascinating world of marine gastropods, soft-bodied creatures that create these intricate shells. From the depths of the ocean to the hands of artisans, seashells have become a symbol of nature's artistry and human creativity. This article explores the journey of marine gastropods, their ecological significance, and the thriving seashell craft industry that transforms these natural treasures into art.

### INTRODUCTION

Gastropods are the most important Phylum Mollusca animals living in freshwater, marine, and terrestrial ecosystems. One significant component of Rocky Shores's ecosystem is the marine gastropods. With 80,000-1,000,000 species worldwide. They make up an important part of the phylum Mollusca. Gastro means "stomach." and Pod means "foot," Their primary habitats are the littoral zones of tropical and temperate oceans. A soft, segmented body without appendages, a calcareous shell, a ventral muscular foot, a fold of skin known as the mantle, lamellae for breathing, and a larval stage in development are the characteristics of the phylum Mollusca. Depending on the species, they can live anywhere from 10 to 40 years They are crucial to the aquatic food web and the marine community. They include detritivores, ciliary feeders, parasites, herbivores, carnivores, scavengers, and algae. The most commonly encountered genera are *Babylonia*, *Natica*, *Bursa*, *Tonna*, *Turritella*, *Murex*, *Conus*, *Oliva*, *Umbonium*, *Cellana*, *Turbinella pyrum* (Sacred Chank) etc. The capture fisheries result in a catchable amount of by-catch, which includes various varieties of molluscs, sea snakes, barnacles, and shells, which are utilized to an extent, but a major share is dumped back into the sea because of no commercial value. Gastropods and bivalves are major by-catch of the molluscan and are used to make handicrafts and curious. It constitutes a particular industry limited to coastal locations employing many coastal populations. Molluscan shell decorations and handicrafts are increasingly expensive in Indian & International markets. Gastropods are exploited daily to sustain the shell craft business.

### Diversity of Ornamental Gastropods in India:

India boasts a diverse and abundant marine ecosystem, including Lakshadweep and the Andaman & Nicobar Islands; the entire length of India's coastline is about 7516.67 km. It was thought that the formation of India's coastline was due to the continental drift of Gondwanaland. The sacred chank (*Turbinella pyrum*) is the most significant ornamental and edible gastropod. The Gulf of Mannar region has spotted heavy exploitation of the sacred chanks. The chank beds or 'paars' are locally known as 'sangunilam', where the bottom is coarse sand and dead corals. Longline fishing for chanks from deeper waters off Vizhinjam was also reported during the December to March season (Appukuttan *et al.*, 1980).

**West coast of India:** Analysis of the gastropod samples from the bycatch of shrimp trawlers along the Sakthikulangara - Neendakara area of Kerala for one year.

**East coast of India:** This part of the country, which borders the Bay of Bengal, is home to a variety of mollusc species, including *Umbonium vestatum* and *Oliva spp.* *Umbonium* may be purchased at Chennai, Cuddalore, Porto-Novo, and Tuticorin.

**The intertidal zones of the Palk Bay and the Gulf of Mannar** are meant for collecting a variety of gastropods (Satyamurti, 1952). The groupings that are most significant are the cowries, cone shells, five-fingered chank (*Lambis lambis*), begger's bowl (*Cannabis melo*), *Pyrene* and *Murex spp.* *Cereftum spp.*, *Cerithidium spp.*, *Trochus spp.*

**Andaman and Nicobar Islands:** Among the commercially valuable molluscs In the Andaman and Nicobar Islands, *Trochus niloticus* and *Turbo marmoratus* have a major place due to their quantity and economic value

### Livelihoods and Employment

**Employment Generation:** The shell craft industry is one of the largest employment generators after agriculture in coastal regions, providing jobs to thousands of artisans, collectors, and traders (World Aquaculture Society, 2019). An estimated 7 million artisans are involved in the broader handicraft sector, with a significant portion engaged in the ornamental gastropod trade (India Brand Equity Foundation) .

**Skill Development:** Many artisans possess specialized skills handed down through generations, particularly in regions like the Andaman and Nicobar Islands, known for their intricate shell crafts (World Aquaculture Society, 2019).

**Income Sources:** Artisans earn their livelihoods through various stages of the trade, including shell collection, processing, and crafting finished products. The income from this trade supports individual artisans and their families, often in communities where alternative employment opportunities are scarce.

### Harvesting Methods and processing:

The methods of exploitation of these shells depend on the size, behaviours and habitats in which they occur. This may be divided into 1.) Hand picking 2) Skin diving 3.) Hand dredging and 4.) By different types of nets viz. trawl, gill and dragnets employed mainly to catch fin fishes, lobster and crabs. A wide variety of shells like chanks, species of *Arca*, *Hemifusus*, *Nathea*, *Strombus*, *Babylonia*, *Conus*, *Murex*, *Harpa*, *Cymbium* etc. form a portion of the by catch in trawl nets operated for shrimps and fish. The ecological habitat surrounding the Mandapam-Rameswaram-Keelakarai coastal belt is ideally suitable for the growth of a variety of gastropod and bivalve shell species. The 21island system in the Gulf of Mannar provides suitable areas serving as breeding grounds for many of the gastropod shells, which form the important components supporting the shell industries in this region. The important centres where the shells are processed are Pampan, Mandapam, Rameswaram, Thirupalaikudi, Devipattanam, Mullaimunai and Thondi.

- Shells are procured from Thoothukudi, Cuddalore and Andaman and Nicobar Islands.
- After drying the shells in the open yard for 4-5 days.
- They are soaked in either fresh and seawater for 3-5 days in cement tanks depending on the size and variety of the shells.
- This enables the removal of dirt and decayed soft part of the animal.
- Then the shells, are placed in the bleaching powder solutions for 24 hrs in cement tanks followed by immersing the shells in caustic soda solutions in another tank for 1-2 hours.
- In order to remove colours of the shell, shells are soaked in hot palm oil for half an hour
- Depending on the thickness, colour and quantity of the shells they are polished by allowing them to remain in 5% HCL for 10 sec to 4 min.

### Legal Framework and Regulation:

#### Commercial Harvesting and Trade Practices

Trawl nets, operating at depths of 100 to 1,000 meters, are the primary method for mass collection of molluscan shells. Each trawler can yield 200 to 500 kilograms of shells, which are sold through auctions to middlemen. The rise in trawler numbers has significantly increased extraction rates. India is a major supplier and importer of molluscan shells, with imports coming from countries like the Maldives, Sri Lanka, the Philippines, Mexico, China, and Tanzania (John *et al.*, 2012). The demand for shells, particularly sacred chanks, has surged in states like West Bengal and Odisha, intensifying fishing pressures.

#### Legal Protection of Marine Molluscs in India

The Wildlife (Protection) Act, 1972 (WPA, 1972), is the primary legislation for wildlife conservation in India. It categorizes species into schedules based on conservation priorities. Currently, 24 marine mollusc species are protected under Schedule I and IV, representing just 0.7% of India's molluscan biodiversity. Despite their commercial value, species like the sacred chank (*Turbinella pyrum*) are not listed under the WPA. Instead, traders often use the African conch (*Busycon contrarium*), marketed as "Valampuri Sangu" or "Dakshinavarti Sankh," as

an alternative. The sinistral (left-coiling) African conch is highly sought after in religious markets, unlike the dextral (right-coiling) Indian sacred chank.

**Marine Gastropods and WPA, 1972 Categories**

Marine gastropods protected under the WPA fall into Schedule I (highest protection) and Schedule II (lower protection).

**Schedule I (Highest Protection Level)**

S. No.	Category	Common Name	Scientific Name
1	<b>Cones</b>	Glory of India Cone	<i>Conus milneedwardsi</i>
2	<b>Helmet Shells</b>	Horned Helmet Shell / King Shell	<i>Cassis cornuta</i>
3	<b>Nautilus</b>	Emperor Nautilus / Chambered Nautilus	<i>Nautilus pompilius</i>
4	<b>Shells</b>	Bull Mouth Helmet / Queen Shell	<i>Cypraeacassis rufa</i>
5	<b>Trumpets</b>	Triton's Trumpet Shell	<i>Charonia tritonis</i>
6	<b>Spirals</b>	Spiral Tudicla	<i>Tudicla spirillus</i>

**Schedule II (Protected, but Lower Penalties)**

S. No.	Category	Common Name	Scientific Name
1	<b>Conches</b>	Chiragra Spider Conch	<i>Harpago arthriticus</i>
2		Harpago Spider Conch	<i>Harpago chiragra</i>
3		Milleped Spider Conch	<i>Lambis millepeda</i>
4		Orange Spider Conch	<i>Lambis crocata</i>
5		Scorpio Spider Conch	<i>Lambis scorpius</i>
6		Sibald's Conch	<i>Dolomena plicata sibbaldii</i>
7		Trapezium Horse Conch	<i>Pleuroploca trapezium</i>
8		Truncate Spider Conch	<i>Lambis truncata</i>
9	<b>Cowries</b>	Limacina Cowrie	<i>Staphylaea limacina</i>
10		Map Cowrie	<i>Leporicypraea mappa</i>
11		Mole Cowrie	<i>Talparia talpa</i>
12	<b>Oysters</b>	Windowpane Oyster	<i>Placuna placenta</i>
13	<b>Top Shells</b>	Commercial Top Shell	<i>Tectus niloticus</i>
14	<b>Turbans</b>	Green Turban	<i>Turbo marmoratus</i>
15	<b>Volutes</b>	Vaxillate Volute / Gold Banded Volute	<i>Harpulina arausiaca</i>

**Penalties Under the WPA, 1972**

Schedule	Protection Level	Examples	Penalties
<b>I</b>	Highest Protection	Bengal Tiger, Marine Gastropods	Imprisonment: 3–7 years; Fine: ₹10,000+
<b>II</b>	High Protection	Indian Cobra, Indian Jackal	Imprisonment: 3–7 years; Fine: ₹10,000+
<b>III</b>	Moderate Protection	Chital, Wild Boar	Imprisonment: Up to 3 years; Fine: ₹25,000
<b>IV</b>	Basic Protection	Common Mongoose, Porcupine	Imprisonment: Up to 3 years; Fine: ₹25,000
<b>V</b>	Vermin	Common Crow, Rats, Mice	No penalties
<b>VI</b>	Plant Protection	Red Vanda, Pitcher Plant	Imprisonment: Up to 7 years; Fine: ₹25,000+

**Cultural Importance of Ornamental Gastropods in Indian Society**

Ornamental gastropods have a rich cultural heritage in India, where they are used in various traditional practices:

**Decorative Art:** Shells are crafted into jewellery, household items, and decorative pieces. They are often used in religious decorations and rituals.

**Musical Instruments:** Conch shells, known as "chank" are blown during Hindu religious ceremonies, symbolizing purity and auspiciousness.

**Folk Medicine:** Certain shells are believed to have medicinal properties and are used in Ayurvedic treatments.



(Source: Kalam Sea shell Mart, Rameswaram.)

### Beliefs and Practices:

**Spiritual Significance:** Shells are considered sacred in many Indian cultures. The sound of the conch is believed to ward off evil spirits and negative energy.

**Astrological Beliefs:** Some shells are thought to bring good luck and are used in Vastu Shastra, an ancient Indian system of architecture and design, to attract positive energy.

**Cultural Symbolism:** Shells are symbols of fertility, prosperity, and longevity. They are often included in marriage rituals and other significant life events.

Ornamental gastropods hold a multifaceted role in Indian society, intertwining with religious, cultural, and traditional practices. They are not only valued for their aesthetic appeal but also revered for their spiritual and medicinal significance, highlighting the deep-rooted connection between natural elements and cultural heritage in India.

### Conservation Efforts:

Several initiatives have been undertaken to protect ornamental gastropod species and their habitats in India. The Central Marine Fisheries Research Institute (CMFRI) has been at the forefront, developing Fishery Management Plans (FMPs) aimed at sustainable utilization of marine resources. These plans include the evaluation of ornamental gastropod fisheries, assessment of the shell craft industry, and investigation of vulnerable coral reef ecosystems, which are crucial habitats for these species.

Furthermore, conservation efforts focus on mitigating the impact of environmental threats such as pollution, habitat destruction, and overexploitation. Restoration projects for coastal habitats and the implementation of marine protected areas (MPAs) are also key strategies used to safeguard these species and their ecosystems.

### Collaboration between Stakeholders

The success of these conservation initiatives largely depends on collaboration between various stakeholders:

**Government Agencies:** The Ministry of Environment, Forest and Climate Change (MoEFCC) oversees the implementation of the Wildlife Protection Act and coordinates conservation efforts. They also work with the CMFRI and other research institutions to monitor and manage marine biodiversity.

**Non-Governmental Organizations (NGOs):** NGOs such as the Wildlife Trust of India and the World Wildlife Fund (WWF) actively participate in conservation projects. They conduct awareness campaigns, community training, and habitat restoration activities.

**Local Communities:** Coastal communities play a vital role in conservation. Community-based management approaches involve local fishermen and shell collectors in sustainable practices. Training programs and alternative livelihood options are provided to reduce dependency on gastropod collection.

**International Cooperation:** India's adherence to international agreements like the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) ensures that the trade of ornamental gastropods is regulated to prevent overexploitation.

**Future Perspectives:**

The Wildlife (Protection) Act, 1972, and its 2002 amendment have imposed strict regulations on the collection of certain molluscan species, impacting the trade. Traders report frequent seizures by law enforcement due to misidentification of species, highlighting the need for better training and resources for regulatory bodies. Environmental challenges such as beach tourism, untreated waste dumping, and dredging operations also threaten gastropod populations, affecting the availability of raw materials for the shell craft industry.

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