



## Systematics of scheduled marine molluscs of India

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### Abstract

In India, molluscs species are exploited on a large scale for their commercial values. Molluscs get endangered due to overexploitation of scheduled species, illegal trade and because of their associated threats, requiring conservation priorities. About 24 species the molluscan species are considered as scheduled species, protected under WPA,1978. The data on the current status of Indian protected species of shells, landing, their life history is lacking. Their systematics is detailed in the manuscript.

**Keywords:** Ornamental molluscs, shell trade, initiatives, management

### Introduction

The marine molluscs are in demand in local markets and in shell trade industries, being traded for their lusture. These molluscan shells are considered as scheduled species that are prohibited from collection under the Wildlife Protection Act (1978) of India. This article details on the systematics of scheduled molluscs that is lacking.

### Methodology

The shells described in this article are compiled from existing literature.

#### 1. *Cassis cornuta* (Linnaeus, 1758)

**Family:** Cassidae

**Common name:** Horned Helmet Shell

**Size:** H = 70-120mm; L = 50-410mm; W = 80-140mm

**Identification:** The largest of all helmet shells, this species has a very solid, heavy, rotund shell with large, horn-like knobs and a wide, flat base. Dorsally pale orange, base vivid orange, faintly marked with white and brown. A large, oblong, heavy parietal shield covers part of the shell. Has a heavy outer lip with 5 to 7 large, whitish teeth on the central inner edge.

**Distribution:** Andaman and Nicobar Islands, East and West coast of India

**Habitat:** Sand and coral rubble, often around reefs.

**Conservation status:** Not Evaluated

**Uses:** Sold as a souvenir or decoration piece and in shell craft industries

#### 2. *Charonia tritonis* (Linnaeus, 1758)

**Family:** Charoniidae

**Common name:** Trumpet triton

**Size:** H = 32-42cm; L = 20-50cm. No. of whorls = 6-7

**Family:** Charoniidae

**Common Name:** Trumpet triton

**Size:** H = 32-42cm; L = 20-50cm. No. of whorls = 6-7

**Shell:** Trumpet shaped. It is large, elongated, conical shell. It is known for its pointed spire and a large, distinctive body whorl. The shell is often mottled in shades of brown and white, and the interior can be orange-pink. Presence of smooth, broad, and flattened spiral ribs, the edge of which are wavy and puckered, and a broad, short siphonal canal with thin folds along the columellar wall are the prominent features.

**Distribution:** Andaman & Nicobar Islands, the Lakshadweep Islands, Tamil Nadu

**Conservation Status:** Not Evaluated.

**Uses:** Ornamental purpose, shell trade

#### 3. *Conus milneedwardsi* (Jousseume, 1894)

**Family:** Conidae

**Common name:** Glory of India

**Size:** W = 33-43mm; L = 103-145mm.

**Shell:** Thin and slender with a smooth surface, acuminate spire and angulate shoulder. White in colour. Two colour morphs can be seen in India. Body whorl with two chocolate spiral bands and a triangular or quadrangular pattern formed by axial reddish-brown reticulated lines is found in west coast. The shell having purple spiral bands forming a pattern is found in east coast.

**Habitat:** Deep sea

**Distribution:** Andaman and Nicobar Islands, East and West coast of India

**Uses:** In shell craft industries

**Conservation status:** Least Concern.

#### 4. *Cypraeassis rufa* (Linnaeus, 1758)

**Family:** Cassidae **Common name:** Bullmouth helmet or pineapple shell

**Size:** H = Upto 35cm

**Shell:** The largest of all helmet shells, this species has a very solid, heavy, rotund shell with large, horn-like knobs and a wide, flat base. Dorsally pale orange, base vivid orange, faintly marked with white and brown. Spire short with channelled spiral ribs that are nodules. Circular operculum with concentric growth lines, Long and narrow aperture with oblique furrow at posterior end, teeth and ridges are whitish on it.

**Habitat:** Sand and coral rubble, often around reefs.

**Distribution:** Andaman and Nicobar Islands, East and West coast of India (Deepak *et al.*, 2021)<sup>[1]</sup>.

**Conservation status:** Not Evaluated

**Uses:** Shell collections, consumption and sold as decorative pieces.

#### 5. *Tudicla spirillus* (Linnaeus, 1767)

**Family:** Tudicidae

**Common name:** Spiral tudicla/Dog chunk

**Size:** L=50 - 82 mm, W=35-44mm

**Habitat:** Shallow depths, between 10 and 20 meters. Coral reefs.

**Shell:** Shiny cream to pinkish grey with sparse flecks of light brown. Fusiform (spindle-shaped) shape, very short spire, papillary (small, nipple-shaped) apex, aperture oval glossy pinkish purple and bounded on the upper side by sharp lip, Inside the outer wall with sharp numerous, fine sharp ridges. Siphonal canal is long and straight, Smooth and flattened Columella with a single fold with a single fold at its forward end.

**Distribution:** Southeast India, Lakshadweep

**Conservation status:** Not Evaluated

**Uses:** Shell craft industries

#### 6. *Dolomena plicata siboldi* (G. B. Sowerby II, 1842)

**Family:** Strombidae

**Common name:** Sibbald's Conch/Pigeon Conch

**Size:** L=29.5— 38.3mm; W=6.35— 11.7 mm

**Shell:** Shell small to medium, ovate-globose, tall spire slender extending one third of the shell. Colour chestnut or cream yellow with brown markings. Aperture is large, semicircular with dentate lips that curve inward, creating a slit-like appearance. Shoulder sculptured with fine knobs. Two strong ribs on the spire with numerous riblets. Outer lip broad and expanded, both lips serrated on the inner margins. Outer surface can be smooth or have reduced sculpture.

**Habitat:** Coral reefs, and deep sea.

**Conservation status:** Not evaluated

**Distribution:** Andaman and Nicobar Islands, Lakshadweep, East and West coast of India

**Uses:** High demand in shell trade.

#### 7. *Herpago arthriticus* (Röding, 1798)

**Family:** Strombidae

**Common name:** Arthritis spider conch/Devil's claw **Size:** L=112— 121mm; W=65— 69 mm

**Shell:** Arthriticus refers to the appearance of the shell, which may have a slightly "knobby" or "jointed" appearance, reminiscent of arthritis. The shell is ovate (egg-shaped) and ventricose (swollen or rounded). The spire (the pointed top part of the shell) is conical and indistinctly muricate (rough with small, blunt projections). The shell has narrow, slightly flattened ribs that are marked by transverse brown lines, white and violet spots, and greyish interstices (spaces between the ribs). The aperture (the opening of the shell) is ovate, with a violet colour on the edge and a reddish interior. Columella (the central pillar-like structure inside the shell) is polished and covered with a large brown spot.

**Habitat:** Deep sea.

**Distribution:** Andaman and Nicobar Islands, Lakshadweep, Pondicherry, Tamil Nadu

**Conservation status:** Not evaluated.

**Uses:** To treat back pain and osteoarthritis, rheumatoid arthritis and other conditions.

#### 8. *Herpago chiragra* (Linnaeus, 1758)

**Family:** Strombidae

**Common name:** Chiragra spider conch

**Size:** L=171-242mm; W=104-170mm

**Shell:** Large thick robust heavy with an anterior notch. With finger like projections on the margins, White colour with brownish patches or flecks, aperture rose pink or orange interior. Six long curved marginal digitations, expanded from the faring, thick outer lip and canals. Prominent

stromboid notch at 4<sup>th</sup> to 5<sup>th</sup> digitations, serrated inner lip. Obtuse and knotty spire, Operculum chitinous dark brown fusiform with fine striations on the inner side.

**Habitat:** Benthic; depth range 0 - 25 m, coral reefs

**Conservation status:** Not evaluated

**Distribution:** Bay of Bengal, Andaman and Nicobar Islands, Lakshadweep, Pondicherry, Tamil Nadu

**Uses:** Human consumption and as a decorative item, shell craft industry in lime production.

#### 9. *Harpulina arausiaca* (Lightfoot, 1786)

**Family:** Volutidae

**Common name:** Gold-Banded Volute or Vexillate volute

**Size:** L= 65-76mm; W= 48-53mm

**Shell:** Broadly ovate (egg-shaped) and relatively heavy, with a thick, robust build. Colour is usually brownish-yellow, orange, or a combination of both, with a prominent, darker band of gold or white, often near the centre of the shell. Surface is smooth and shiny, with subtle spiral grooves. Spire is short and somewhat blunt, with a relatively wide opening.

**Habitat:** Sandy bottoms in shallow coastal waters.

**Distribution:** Lakshadweep islands, Southeast coast of India

**Conservation status:** Not evaluated

**Uses:** Shell craft industry

#### 10. *Leporicypraea mappa* (Linnaeus, 1758)

**Common name:** Map cowrie

**Size:** L= 45-100mm

**Shell:** Resembles the distinctive colour pattern of its shells to ancient maps. Shell globose with a near elliptical slightly elongate outline, narrow and relatively long aperture, arrays of small teeth on inner and outer lips, inflated dorsal side and slightly concave ventral side. Shell cream or white in colour, with many longitudinal lines and circular empty spaces. Dorsal mantle groove is devoid of lines. Both the ventral side of the shell and the labral teeth may vary greatly in color, ranging from white or cream, purple, brown, orange or pink.

**Habitat:** Found in shallow coral reefs, under stone at depths of 45m.

**Distribution:** Andaman and Nicobar Islands.

**Conservation status:** Not evaluated

**Uses:** Caught for human consumption, use in traditional medicine and linked with many superstitions. Shells were highly prized by private collectors till the 1950's and are now used as currency, ornaments and charms.

#### 11. *Talparia talpa* (Linnaeus, 1758)

**Common name:** Mole cowrie.

**Size:** L= 50-70mm, W=25-40mm, H=22-34mm

**Shell:** Dorsum smooth and shiny, brown or yellow-brown in colour with 3-4 light brown transversal bands. Margins, base and teeth completely dark brown or black. Mantle well-developed, greyish or black, with long cylindrical papillae.

**Distribution:** Andaman and Nicobar Islands, Lakshadweep, Pondicherry, Tamil Nadu, Gujarath.

**Habitat:** Benthic; depth range 0 - 10 m

**Distribution:** Lakshadweep archipelago, including islands like Minicoy, Kalpeni, and Kavaratti.

**Conservation status:** Not evaluated

**Uses:** High demand in shell trade.

**12. *Lambis millepeda* (Linnaeus, 1758)****Family:** Strombidae**Common name:** Milleped spider conch**Size:** L= 90 -150mm**Shell:** Angle armed with four digitations, the uppermost being an intercalated one. Posterior digitation simple. Lateral digitations, especially the primary, much recurved. Lips with wrinkles moderately developed. Lips rugose. Intercalary digitations developed. Posterior digitation simple.**Distribution:** Andaman and Nicobar Islands and the Lakshadweep**Habitat:** Coral reefs.**Conservation status:** Not Evaluated**Uses:** Industrially used in lime production and sold as decorative items.**13. *Lambis scorpius* (Linnaeus, 1758)****Family:** Strombidae**Common name:** Scorpio spider conch**Size:** L= 90 - 150mm**Shell:** The shell is elongated and solid, with a spire of about eight whorls. It can grow to be quite large, with adults ranging from 95 mm to 220 mm in size. The most characteristic feature is the six slender, digitate (finger-like) extensions that emerge from the outer lip of the shell, giving it the appearance of a scorpion's tail or spider legs. The stromboid notch, a notch in the outer lip of the shell, is present. The anterior siphonal canal is moderately long and slightly twisted to the left.**Distribution:** Andaman and Nicobar Islands and the Lakshadweep**Habitat:** Benthic; depth range 0 - 5 m**Conservation status:** Not Evaluated**Uses:** Food, shell trade and lime production.

*Cassis cornuta*, *Charonia tritonis*, *Conus milneedwardsi*, *Cypraeaassis rufa*, *Tudicla spirillus*, *Dolomena plicata siboldi*, *Herpago arthriticus*, *Herpago chiragra*, *Harpulina arausiaca*, *Leporicyprea mappa*, *Talparia talpa*, *Lambis millepeda*

**14. *Turbo marmoratus* (Linnaeus, 1758)****Family:** Turbinidae**Common name:** Great Green Turban**Size:** L= 18cm.**Shell:** Thick, heavy, dextrally coiled and roughly turban-shaped. The body whorl is large, with a small, pointed spire.

The length of the shell is roughly equal to the width. The spire whorls are rounded, but the body whorl has an angular shoulder. The shell is marked with fine axial growth lines and three large spiral ribs, bearing blunt tubercles. The aperture is very large, forming 2/3 of the length of the shell, and is nearly circular, surrounded by a thick pearly lip. The operculum is calcareous, with a granular surface.

**Distribution:** Andaman and Nicobar Islands.**Habitat:** In crevices on the crest and outer slope of shallow coral reefs till depths of 20m below surface. Prefers regions of oceanic currents.**Conservation status:** Not Evaluated**Uses:** Extensively used for food, shell jewellery, inlay, and button making.**15. *Staphylaea limacina* (Lamarck, 1810)****Family:** Cypraeidae**Common name:** Limacina Cowrie or Slug-like Cowry.**Size:** L= 8-39mm**Habitat:** Coral reefs and rocky areas.**Shell:** The shell is oval, elongated, and has a pointed spire and white base. The dorsal surface is usually pale brown or pinkish, adorned with whitish spots or small, round, whitish protuberances. There are also two orange-brown areas at the extremities.**Distribution:** Andaman and Nicobar Islands, Lakshadweep, Tamil Nadu**Uses:** Used as currency in the past, in jewellery, and for traditional medicines. The shells are also used in purses, charms, ornaments, belts, and decorative pieces.**Conservation status:** Not Evaluated**16. *Pleuroploca trapezium* (Linnaeus, 1758)****Family:** Fasciolaridae**Common name:** Trapezium horse conch**Size:** L= 85 -250mm.**Shell:** Large, elongated, solid and heavy golden-brown shell; spire of moderate length; apex usually eroded; columella smooth posteriorly; sutures constricted; thick, blunt nodules on upper whorls and shoulders of body; fine brown spiral lines on surface; pale aperture with strong internal ridges; dentate upper lip with seven pairs of teeth; siphonal canal extended and short; and weak fasciole.**Habitat:** Shallow waters near reefs and rocky areas, and on seagrass beds at depths between 0-40m.**Conservation status:** Not Evaluated, **Distribution:** Andaman and Nicobar Islands, Lakshadweep, East and West coasts**Uses:** Human consumption, Sold as a handicraft item. Used as a trumpet when tip of the spire is cut off.**17. *Rochia nilotica* (Linnaeus, 1767)****Family:** Trochidae **Common name:** Commercial trochus or Top shell or Lola snail**Size:** L=50-165mm, W=100-120 mm.**Shell:** Conical, large, thick and very heavy. Body whorl almost smooth, with concave sides above a protruding, acutely rounded and thickened periphery. Base shell flat. Aperture squarish. Colouration: shell off-white, with large irregular axial reddish stripes. Operculum circular, thin, corneous, orange brown. Smooth columella.**Habitat:** Benthic; depth range 0 - 20 m**Distribution:** Andaman and Nicobar Islands**Uses:** Food and ornamental purpose. Mother of pearl is used in button making.

**Conservation status:** Not Evaluated

**Ecology:** Feeds on microalgae on coral reefs maintaining health of coral reefs.

### 18. *Ophioglossolambis digitata* (Perry, 1811)

**Family:** Stromboidea

**Common Name:** Elongate spider conch or finger spider conch.

**Size:** L=152.5-187.4 mm

**Shell:** Shell brown, striped with white; flattened from top to bottom, the cheek very much expanded, and divided into ten segments, pointed, rounded, and arcuated; Compared to other similar species, *O. digitata* is characterized by its more flattened shape, longer spines, smaller spire, and overall, less stout build. Labrum with eight major digit-like spines that extend to the right. These spines are dorsally compressed and can have smaller, spiny processes between them. The posterior-most spine is often bifurcated, forming a spoon-like structure. The shell also has a long, straight siphonal canal and a distinctive shoulder cord with rounded knobs. The background coloration is light yellowish-tan, and the surface texture is satiny to slightly glossy.

**Distinguishing Features:** Digitations (the finger-like projections), can be identified by the forked posterior digit and their distinctive aperture pattern.

**Habitat:** Inhabit depths between 10-40 m.

**Distribution:** West Bengal

**Conservation status:** Not Evaluated

**Uses:** Aquarium trade, Decorative purposes.

### 19. *Lambis truncata* (Lightfoot, 1786)

**Family:** Stromboidea, **Size:** L= upto 40cm.

**Common name:** Truncate Spider Conch, Giant Spider Conch, Giant Spider Stromb.

**Habitat:** On rubble and coarse sand in shallow coral reef areas.

**Distribution:** Andaman and Nicobar Islands, Lakshadweep, Tamil Nadu

**Shell:** Heaviest of spider shells. Lips smooth. Body whorl unarmed at angle. Angle coronated on spire, unarmed on the last whorl; labium with the callus diffused; labrum with its margin erect, with six moderate digitations, and with the antinatural lobe a little undulated. Younger shells creamy white; columella and lip usually mauve brown when older.

**Conservation status:** Not Evaluated

**Uses:** Shell trade, Food, industrially used in lime production and sold as decorative items.



*Lambis Scorpius*, *Turbo marmoratus*, *Staphylaea limacina*, *Rochia nilotica*, *Pleuroploca trapezium*, *Ophioglossolambis digitata*, *Lambis truncata*

## Bivalves

### 1. *Tridacna maxima* (Röding, 1798)

**Family:** Cardiidae

**Common name:** Elongated Giant Clam

**Size:** L = 110-130mm; W =85-95mm

**Shell:** Primarily greyish-white, but can be tinted yellow or pinkish-orange, and rarely completely yellow. Shape Elongated, longer than tall, and can vary in thickness. Margins wavy with 5 triangular corners. Rib Pattern is characterized by four or five smoothly curved, interdigitating projections on each half of the shell. May have petal or shelf-like structures called scutes.

**Habitat:** Shallow water coral reefs

**Distribution:** Andaman & Nicobar Islands, Tamil Nadu

**Conservation status:** Not Evaluated

**Uses:** Human consumption. Shells are used in pottery glaze and floor tiles.

### 2. *Tridacna squamosa* (Lamarck, 1819)

**Family:** Cardiidae

**Common name:** Fluted giant clam or scaly clam

**Size:** L = max. 45 cm

**Habitat:** Anchored to rocks at the sandy bottom of shallow water coral reefs at depths of 15-20m. Usually anchored among *Acropora* corals.

**Shell:** Shell large with leaf-like fluted scales. Mantle brown, generally mottled with vivid green and blue spots or wavy lines. Fluted giant clam or scaly clam, is characterized by a large, solid shell with prominent, leaf-like, fluted scales or scutes. These scales are arranged along the radial ribs of the shell. The shell is typically white, yellow, orange, or pink on the exterior, and the interior may be similarly coloured. It has a byssal opening that is smaller compared to other giant clams.

**Distribution:** West and east coasts, Andaman and Nicobar Islands

**Conservation status:** Least Concern

**Uses:** Food items, ornamental for aquariums. Shells are used in pottery glaze and floor tiles.

### 3. *Hippopus hippopus* (Linnaeus, 1758)

**Family:** Cardiidae

**Common name:** Bear Paw Clam or Horse's Hoof Clam

**Size:** L = up to 45 cm

**Shell:** Large, ovate elongate to ovate subrhomboidal in shape. White to grey in colour. The valves are thick, heavy and triangular in shape, often covered with reddish spots and obscured by encrustations. Outer margin is wavy, deep ridges run vertically across the surface, as many as 14, less pronounced folds.

**Habitat:** Shallow water coral reefs

**Distribution:** Andaman and Nicobar Islands

**Conservation status:** Vulnerable

**Uses:** Human consumption and industrial applications.

### 4. *Placuna placenta* (Linnaeus, 1758)

**Common name:** Windowpane oyster

**Family:** Placunidae

**Size:** Over 150mm

**Habitat:** Benthic; depth range 0 - 100 m

**Shell:** Highly asymmetrical bivalve. Characteristically large, flat, thin, pearly, sub-orbicular, translucent shell with a mica-like appearance. Outer shell surface marked by projecting imbricate lamellae. Inner shell surface smooth

with a high polish. Right valve almost flat, left valve slightly convex. Male gonad smaller and dull yellow, female gonad relatively larger and orange yellow. *P. placenta* lacks byssus. It looks similar to *Placuna sella*, but its shells are sub-orbicular in shape rather than a saddle shape.

**Distribution:** Andaman and Nicobar Islands, Lakshadweep, East and West coasts of India.

**Conservation status:** Not Evaluated

**Uses:** Shell trade, Manufacturing lamps, articles for display, hair clips and other accessories (D'Souza and Shenoy, 2023) [2].



*Tridacna maxima*, *Tridacna squamosa*, *Placuna placenta*, *Hippopus hippopus*

### Cephalopoda

#### 1. *Nautilus pompilius* (Linnaeus, 1758)



**Family:** Nautilidae

**Common name:** Chambered nautilus

**Size:** L = 10-20cm.

**Shell:** With distinctive, smooth, coiled, body whorl cream with reddish wavy lines. Umbilicus small colour variable comprising irregularly radiating brown stripes that extend from umbilicus to venter. Also, shells show countershading with lighter bottoms and darker opening.

**Habitat:** Near the bottom of shores and coral reefs, up to a depth of 500m.

**Distribution:** Andaman and Nicobar Islands, East and West coast of India

**Conservation status:** Not Evaluated

**Uses:** Research, Food and in shell craft industry.

**Conclusion:** The similarity between protected and nonprotected molluscan species (*Lambis* spp) is an obstacle to stop the shell trade. Shell taxonomy is challenging due to their similarity in morphology. Often wrong shells are caught in bycatch and traded. Use of old scientific names creates confusion in their identification. The taxonomic details provided in this here are expected to benefit fishermen, researchers, scientists and conservationists.

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### References

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