

STAR SHELLS, TURBANS, DELPHINULAS & PHEASANT SHELLS

List of species

Family: Turbinidae Rafinesque, 1815

1. *Astralium heimburi* (Dunker, 1882)
2. *Astralium rhodostomum* (Lamarck, 1822)
3. *Astralium semicostatum* (Kiener, 1850)
4. *Turbo intercostalis* Menke, 1846
5. *Turbo petholatus* Linnaeus, 1758

Family: Angariidae Gray, 1857

1. *Angaria delphinus* (Linnaeus, 1758)

Family: Phasianellidae Swainson, 1840

1. *Phasianella solida* (Born, 1778)

Other species reported from Sri Lanka

Astralium costatum (Kiener) (Unverified)

Turbo marmoratus Linnaeus, 1758

Turbo stenogyrus P. Fischer, 1873

Family: Liotiidae Gray, 1850

1. *Liotinaria cidaris* (Reeve)(sic)
= *Liotina cidaris* (Reeve, 1843)

accepted as *Globarene cidaris* (Reeve, 1843)

- Kirtisinghe, 1978

This section deals with species in three families in the sub-class Vetigastropoda.

In general, this is a large group previously placed in the family Turbinidae with strong top-shaped to conical shells, sometimes flattened. Shells sometimes very thick, smooth or with spiral ornament, at times with spines or nodules. Aperture rounded, without a siphonal canal, lips smooth. Umbilicus is present at juvenile stages. Interior nacreous. Operculum horny or calcareous. Periostracum well developed to absent.

Mainly living in shallow, warm temperate to tropical seas, on rocky and coral reef habitats. They are herbivorous, feeding on encrusting algae and vegetable detritus.

(Poutiers, 1998; de Bruyne, 2003; Siddiqui et al, 2007)

The family was divided into ten or more subfamilies, many containing micro-molluscs (less than 6 mm in size). Subsequently, some of the subfamilies were elevated to family rank. Three families are represented in this section. Kirtisinghe, 1978 records one species in the family Liotiidae as well—this has not been collected by the writer and is not described. The colourful, characteristic opercula are illustrated on the next page.



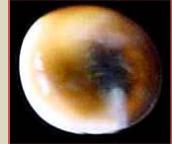
Astralium opercula are colourful. The flat inner-side shows spiral growth. The domed outer side is glossy, smooth.

At right - *A. rhodostomum* (above), *A. semicostatum* (below).



The opercula of *Astralium*, *Turbo*, and *Phasianella* are calcified, thick and button-like, and coloured. That of *Angaria* is thin and corneous and resembles the opercula of Trochidae.

Turbo opercula are thick and circular, hemispherical, glossy with granular margin on the outside, flat on the inside showing spiral growth.



Left - *Turbo intercostalis*
Right - *T. petholatus*

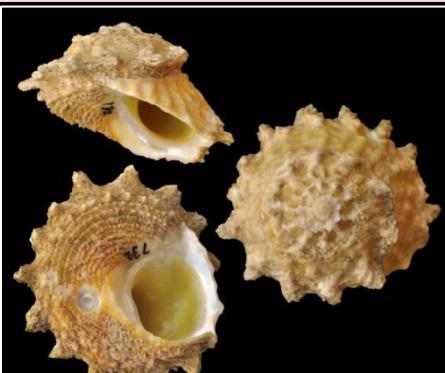


Left - *Angaria* have thin, circular, corneous opercula.

Right - *Phasianella* have thick, oval, white calcareous opercula.



Turbinidae



Astralium heimburi
Actual size 35mm diam.



Astralium rhodostomum
Actual size 19 x 23 mm



Astralium semicostatum
Up to 21mm



Turbo intercostalis
Actual size 33.7mm



Turbo petholatus
Actual size 47.3mm



TURBINIDAE Rafinesque, 1815

Turban shells and star shells

Robust cone or top-shaped shells, or 'turban-shaped' with rounded whorls. Operculum calcareous. The species described under this family are all in the subfamily Turbininae. The Subfamilies Angariinae and Phasianellinae (of Turbinidae) have been elevated to family status as Angariidae and Phasianellidae.

1. *Astralium heimburgi* (Dunker, 1882) Heimburg's Star Shell

[*Uvanilla heimburgi* Dunker, 1882; *Astrea heimburgi* (Dunker, 1882)]

Shell low conical with carinate shoulder from which protrude flattened spines. Suture imperceptible except between the body and penultimate whorl where it becomes very constricted so that the penultimate whorl overhangs the body whorl (seen in side view, bottom right). Upper surface covered by rounded radial ribs; under-surface bears spiral cords covered by fluted spines. Whitish, interior golden with an opalescent margin.
23 x 35 mm (ht x w)

Ananda Thenabadu beach collection. The shell was thickly covered with calcareous deposits and dried algae.
- Kira, 1962 p. 20 Pl. 12-8.

2. *Astralium rhodostomum* (Lamarck, 1822) Red-mouth star shell

[*Trochus rhodostomus* Lamarck, 1822; *Astrea rhodostoma* (Lamarck, 1822)]

Shell top-shaped, base flat, suture constricted. Sides straight, lower edge of whorls overhanging that below. Aperture on underside, columella smooth with a blunt tooth at the lower end. Sculpture of axial ribs, about every fourth one enlarged and projecting below the whorl margin as a blunt tooth. Under side with concentric scaly ribs. Interior and columella nacreous. Exterior heavily encrusted with calcareous deposits. Shell pinkish in colour. The operculum calcareous, oval in shape, smooth and glossy, upper surface off-white with a deep pink margin, under side deep pink-brown.
15.5 x 23; 19 x 23 mm (ht x w)

Jaffna, Mandaitivu, boat anchorage, fishing trash (?). Alive at water's edge.

3. *Astralium semicostatum* (Kiener, 1850) Half-ribbed Star shell

[*Trochus semicostatus* Kiener, 1850; *Astrea semicostata* (Kiener, 1850)]

Shell conical with straight sides, apex pointed, base flat, star-shaped, containing the ovate aperture. Outer lip smooth, sharp, inner lip also sharp, from below the short columella to the periphery. Columella concave, with a notch at its lower end below a short, transverse rib. Sculpture of thick oblique axial ribs on the lower half of the whorls that protrude beyond the margin as tubercles. On the upper half of the whorls are thinner ribs at a different angle forming a band above the origins of the main ribs. The flat base is covered by 10 - 12 rows of close packed scaly spiral cords that extend on to the underside of the projecting tubercles. Colour off-white, the interior and the columella porcelain white. Operculum calcareous: ovate, nucleus eccentric, coiling in a gradually thickening broad spiral set on a flat platform that

forms a rim at the periphery of the spiral. The outer border of the spiral marked with grooves and ridges, the platform with fine grooves. Whitish blushed with blue-green, the platform a darker blue-green.

15 x 22 mm (ht x w)

Wellawatte, 3 m, in sea urchin burrow, 18 m, heavily encrusted; Matara, Polhena beach, empty, 21 mm. Heavy calcareous encrustation ~ partially cleaned.

- Kirtisinghe, 1978 p. 52; Siddiqui et al, 2007.

4. *Turbo intercostalis* Menke, 1843

[*Turbo radiatus* Reeve, 1848]

Turban shell

Shell turbinate with rounded whorls and a pointed apex, suture becoming channelled and constricted in later whorls. The spire short, the body whorl large. Aperture round, outer lip thin, sharp, no teeth. Columella convex, smooth. Inner lip above and below the columella thin, the upper part in contact with the underside of the penultimate whorl. Umbilicus open, deep. Ornamentation consists of thick and thin spiral cords crossed by growth lines that make them rough. A strong cord at the shoulder forms a ridge, the subsutural area above flat and sloping, the area below rounded. A less strong cord is usually found lower down, with a variable number of thickened cords in between the two. The lowermost three cords are of increasing thickness, that around the umbilicus particularly strong.

Colour chocolate brown with axial streaks of brownish cream. The streaks usually regular and distinct above the shoulder ridge, indistinct and broken up into patches below. Lips and columella white, interior nacreous. Operculum hemispherical, the inner aspect flat and consisting of the horny layer showing the central nucleus and spiral growth; outer portion calcareous, domed, the periphery pustular, centre smooth and shiny. Cream coloured with a central brownish patch and part of the periphery similarly coloured but darker, with greenish tints.

Between the outer and nacreous layers of the shell is a bright green layer that may be seen as a faint green line around the aperture margin. In very weathered beach specimens this layer may be visible as bright green markings on the brown shell.

40 x 32; 33.5 x 29; 32 x 19. 4 mm (ht x w)

Mount Lavinia, Bellangala, 5 m; Beruwela, Barberyn reef, tide pools; Galle, Unawatuna bay, 5 m, on rock near coral; Kirinda, purchased from vendor, very weathered beach specimens exposing the bright green middle layer.

- Kirtisinghe, 1978 p. 53.

5. *Turbo petholatus* Linnaeus, 1758

Tapestry or Cat's Eye turban

[Many synonyms]

Shell turbinate, whorls rounded, incised suture, spire short, body whorl large. Aperture large, round. Outer lip thin, sharp, smooth. Columella curved, smooth, callus thick, a small pad covering the umbilicus. No siphonal canal. No ornamentation, the exterior being smooth and glossy. Colour chocolate brown with a number of spiral bands of black spotted or cross hatched with cream to blue-grey. Sometimes with brownish-pink spiral bands or irregular patches between the black bands. Columella and lip white, interior nacreous, silvery white. Sometimes the columella callus yellow-orange. Operculum nearly circular in outline, the inner aspect flat, horny, showing a subcentral nucleus and spiral growth. The outer aspect calcareous, convex, largely smooth and glossy with a faintly granular periphery. White with a bluish-black central spot and tawny periphery to one side or more diffusely.

49 x 45; 48 x 41; 40 x 36 mm (ht x w)

Kalpitiya, Bar reef, 7-8 m, a large number found empty, discoloured.; 2-3 m, empty, undamaged shells and opercula at entrance to an octopus lair.

- Poutiers, 1998; Eisenberg, 1998 p. 43; Oliver, 1989 p. 38; Kirtisinghe, 1978 p. 54; Fiene-Severns et al, 1998 p. 11.



ANGARIDAE Gray, 1857

Delphinulas

Surface rough with spines. open umbilicus. Operculum corneous.

1. *Angaria delphinus* (Linnaeus, 1758)

[*Turbo delphinus* Linnaeus, 1758;

Common delphinula

A number of other synonyms; *A. rugosa*, a name used by Kirtisinghe, 1978 is not listed in MolluscaBase.]

Shell turbinate with flattened spire, loosely coiled. Whorls rounded with a keeled, spiny shoulder. Aperture circular, smooth, columella smooth. Umbilicus open, deep. Sculpture of spiny spiral ridges below the shoulder keel; above the shoulder are fine spiral cords crossed by oblique radial rays. External colour a deep rose-red, the upper parts tending to be white. Interior white. Operculum corneous, circular.

26 x 30.4, 21 x 29, 17 x 25.5 mm (ht x w).

Jaffna, Mandaitivu beach, fishing trash; Silavaturai, Doric beach, beached, weathered, empty.

- de Bruyne, 2003 p. 62; Kirtisinghe, 1978 as *Angaria rugosa*.



PHASIANELLIDAE

Pheasant shells

Pointed, conical shells, smooth or with spirals, variable colouration, interior white without nacre and calcified opercula.

1. *Phasianella solida* (Born, 1778) Solid pheasant

[*Helix solida* Born, 1778]

Shell conical with rounded whorls, the spire about half the total height. Suture incised. Aperture ovate, outer lip thin, sharp, smooth. Columella curved, smooth, inner lip covering the umbilicus. No siphonal canal. No ornamentation, faint growth lines, exterior polished and glossy. Clouded patches of dark brown/purple/red/cream. A subsutural band of cream and brown patches. The whole overlaid with fine spiral lines of white dashes, sometimes alternating with brown. A second specimen orange-brown with clouds, subsutural band black/white spots. Columella and interior white. Operculum calcareous, ovate. Inner aspect concave with spiral rib, nucleus subterminal, two spirals, the ultimate one very large. External aspect convex, smooth and glossy. Porcelain white.

20 x 12 mm (ht x w). 13.3 x 8.5 mm (ht x w).

Mount Lavinia, Bellangala, shoreward rocks, 3-4 m, on the undersides of the brown seaweed *P. tetrastromatica*; Beruwela, Barberyn Reef, beached, crab occupied, Orange-brown with clouds, subsutural band black/white spots.

References say "usually dredged". Found on two occasions at Bellangala rocky islet off Mount Lavinia. On both occasions they were abundant on the under sides of the fronds of *Padina tetrastromatica* - a brown seaweed not usually found at this locality.

- Eisenberg, 1989 p. 44 as *aethiopicus*; Abbott, 1994 p. 22; Oliver, 1989; De Bruyne, 2003.

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