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GASTROPODS

by J.H.Leal, The Bailey-Matthews Shell Museum

GENERAL REMARKS

The Gastropoda constitute one of the most speciose and diverse groups of animals, comprising more than half of all named molluscs (at the class rank, Gastropoda is second only to the Insecta in number of species). The widely varied array of body plans and shell shapes in the Gastropoda reflects the diverse paths on which the group radiated since the Cambrian. As briefly discussed below, this diversity is a result of some basic constraints defined early in the evolutionary history of the class.

Gastropods are asymmetrical molluscs that underwent torsion. The body is generally divided into 2 main regions: (1) head-foot and (2) mantle (including shell), mantle cavity, and visceral mass. In most gastropods the muscular foot is the locomotion organ; gastropods mainly crawl, attach, or burrow using the foot. The head includes sense organs (e.g., tentacles and eyes) and in many groups is the site of concentration of nerve ganglia and connectives. The mantle, typical of molluscs, lines the shell internally; its external edge is the site of shell deposition. The space between the head-foot and the mantle proper is the mantle cavity, where the ctenidium (or ctenidia), osphradium, anus, nephridiopore, and external genitalia are located. The visceral mass, located in posterior direction, is the location of the gonads, digestive gland, heart, kidney, and part of the alimentary system.

The Gastropoda are almost universally accepted as a monophyletic group. Gastropods are defined by the presence of characters such as a larval operculum, but mainly by undergoing torsion and displaying associated anatomical conditions, such as an increased concentration of organs in the visceral mass. Torsion (not to be confused with coiling of the shell around a point or an axis) is the rotation of the visceral mass and mantle (including shell) for up to 180º in relation to the head and foot, always in a counterclockwise direction, and most frequently in the late-veliger larval stage. During torsion, the mantle cavity and its organs rotate from a posterior to an anterior position. As a result, the longitudinal nerve cords connecting the visceral to the pleural ganglia in a fully torted gastropod form a figure-eight, and the digestive tract is twisted into a U-shape that loops back into the visceral mass. Torsion moves the mantle cavity, and associated organs such as the adult anus, nephridiopores, and gonopores to a more anterior position. Many of the evolutionary pathways in post-torsional gastropods seem to involve modifications to prevent fouling of the anterior region of the mantle cavity (which includes the ctenidia) and head. That includes the gradual displacement of the anus back in posterior direction in vetigastropods such as keyhole limpets, abalones, and slit and top snails. The torted condition is found in most shelled gastropods, but gastropods in the Euthyneura (e.g., pulmonates, opisthobranchs) have secondarily reverted to several stages of detorsion.

Coiling is a phenomenon closely linked to torsion, probably a solution to the spatial constraints of the post-torsional anterior 'piling up' of mantle cavity + visceral mass + shell. Coiling in its simplest form is planispiral, where the shell + visceral mass ensemble coils around a point. The most frequent form of coiling in gastropods, however, is helicoidal, with asymmetrical coiling of the shell around a line producing a skewed turbinate coil. In contrast to simpler planispiral coiling, helicoidal coiling provides larger whorl diameters at older, higher parts of the shell, allowing for more internal space for the visceral mass. The trade-off for the spatial advantages offered by helicoidal coiling is a marked loss of symmetry in the gastropod arrangement of internal organs, in particular those of the mantle cavity: as one of the results of right-handed coiling in gastropods, the right-side member of paired organs such as ctenidia and osphradia are reduced or completely absent in most gastropod groups.

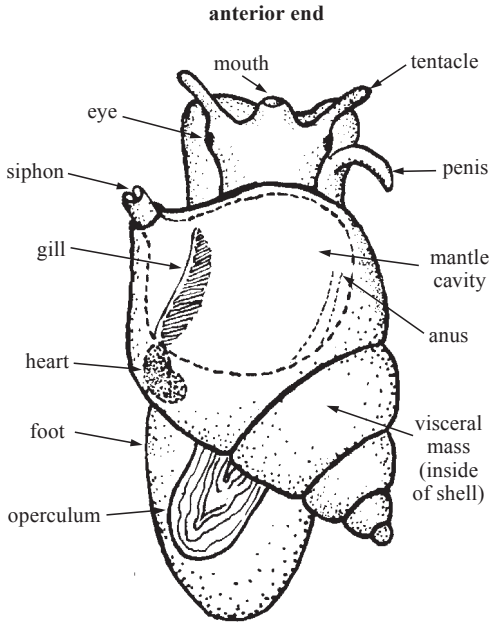
The Gastropoda exhibit extremely diversified food habits. There are predators, scavengers, filter- and deposit-feeders, macro- and micro-herbivores. In addition, in order to reach the food source, some gastropods are able to drill through hard structures (e.g., shells) using the radula.

From the standpoint of reproduction, gastropods may be dioecious or hermaphroditic (simultaneous or protandric), and may perform internal or external fertilization. Most gastropods go through pelagic larval development of varied duration (from a couple of hours to a few months), but some groups are known to have bypassed pelagic development, undergoing intracapsular (direct) development instead.

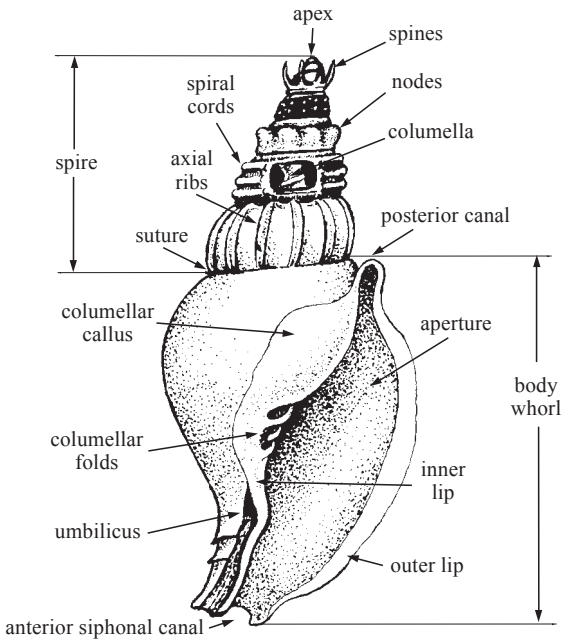
The types of habitats occupied by gastropods are also extremely diversified; gastropods inhabit both terrestrial and aquatic environments, and in the marine environment, can be found from the bottom of the deepest ocean trenches to the canopies of mangrove forests.

Although showing a lower number of species when compared to other areas of the world's oceans (e.g., Western Central Pacific), Fishing Area 31 includes some of the richest and most diverse marine areas in the Atlantic Ocean, the Caribbean Basin and the Antilles. Within molluscs, gastropods in Fishing Area 31 represent the third class (after bivalves and cephalopods) in catch by weight. At least one genus, *Strombus*, comprised about 1% of the total catch (including fishes, crustaceans, and other molluscs) for the area in 2000.

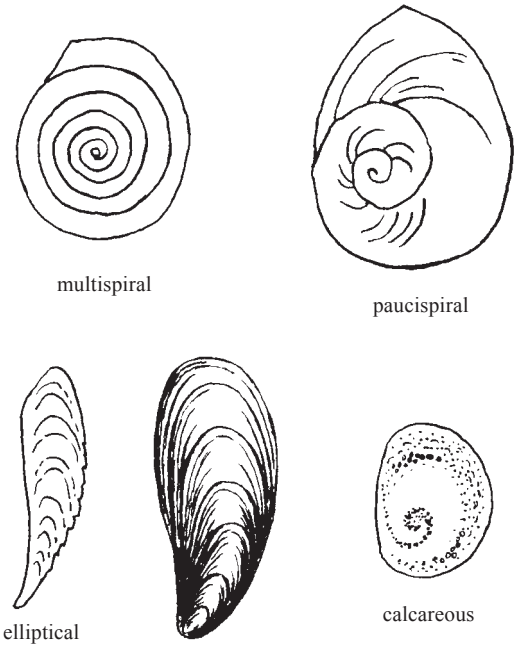
TECHNICAL TERMS AND MEASUREMENTS



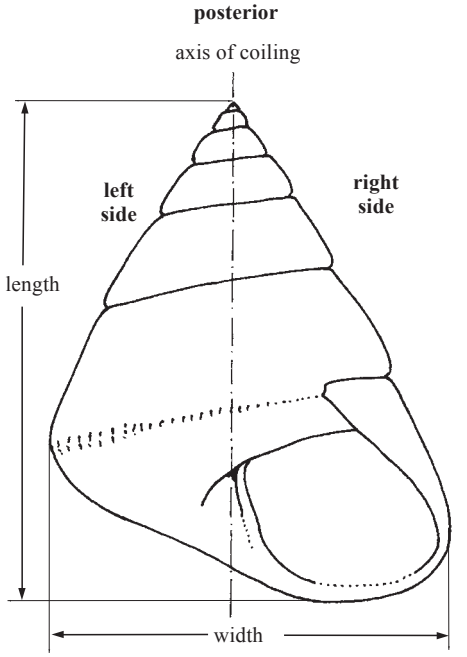
dorsal view of animal



ventral view of a composite shell



operculum types



orientation and measurements of a shell

general characteristics of gastropods

GLOSSARY OF TECHNICAL TERMS

Albino - shell lacking normal pigmentation.

Anterior - region situated near the head. In gastropods: in front.

Anterior canal - expansion looking like a groove or a tube and serving to protect the siphon in gastropod shells.

Aperture - opening in gastropod shells.

Apertural - position relative to the aperture of gastropod shells.

Apex - extremity of a gastropod shell opposite to the anterior region; part of the shell built in earlier life.

Apical - situated at or near the apex of a gastropod shell.

Axial - direction forming a plane with main shell axis in gastropods.

Basal - position relative to shell base.

Base - part of the gastropod situated in opposition to the apex.

Bottom of the shell - same as base.

Body whorl - most anterior whorl of the gastropod shell, last and largest whorl.

Callus - thickening of the shell, secondary, smooth, sometimes glazed, usually secreted on the parietal region of the columella.

Cancellate - feature of cross-barred sculpture of some gastropod shells consisting of axial and spiral elements of same intensity crossing at right angles.

Columella - column or pillar located on the centre of a gastropod shell.

Cord - element of gastropod shell sculpture, usually spirally oriented, thicker than line.

Cordlet - narrow cord, thicker than line.

Corrugated - appearance of surfaces forming wrinkles.

Crenulated - appearance of surfaces that are delicately notched or corrugated. Term usually applied to wrinkled shell margin or edge.

Crenulations - notches, or wrinkles that are small and delicate.

Denticles - features of sculpture elements looking like small teeth-like projections. Term usually applied to features seen on the internal part of the aperture.

Depressed - outline of low, pressed-down gastropod shells. Term usually applied to some top shells.

Dorsal - region opposite to the foot in gastropods.

Egg-ribbon - same as ribbon.

Elongate - shell with length significantly larger than width.

Excavated - appearance of a hollow, concave surface.

Fold - ridge spiralling on columella.

Foliated - characteristic of being leaf-like.

Foot - in gastropods, fleshy, sole-like, muscular part of body involved in locomotion.

Furrow - groove in longitudinal direction found on the dorsal region of, among other shells, cowries and Triviidae.

Fusiform - characteristic of being spindle-shaped.

Glassy - surface resembling glass, vitreous, transparent.

Globular - shape resembling a sphere or a ball.

Globose - same as globular.

Granulated - surface covered with minute grains, pustules, or beads.

Growth lines - lines on shell surface indicative of alternating periods of growth and rest; sometimes corresponding to seasonal changes.

Horny - substance that is hardened and proteinaceous; present in or completely forming the gastropod operculum and shell periostracum.

Incised lines - features of shell sculpture represented by cuts or narrow grooves on the shell surface.

Indentation - cut or notch on shell edge or parietal region.

Indented - surface bearing an indentation.

Interspaces - spaces between sculptural features, such as ribs, costae, or cords.

Juvenile - characteristic of being young, immature, not fully grown.

Keyhole - apical orifice in some limpets.

Knob - large nodule, rounded projection.

Knobbed - surface bearing knobs.

Lamella (pl. lamellae) - thin plate or blade-like projection.

Lamellation - same as lamella.

Ligament - structure that is horny and proteinaceous, acting as a spring tending to keep the valves opened in bivalve shells. Usually situated in the region of the hinge, either internally or externally.

Line - sculptural feature narrowly incised on shell surface.

Lip - edges of the outer surface of the aperture in the gastropod shell.

Longitudinal - direction parallel to the largest dimension of the shell or mollusc.

Nacreous - characteristic of being iridiscent, like mother-of-pearl.

Nodules - projections that are rounded as tubercules.

Nodulose - surface bearing nodules.

Notch - cut or depression on any margin, canal, or on the gastropod aperture.

Opalescent - characteristic of being whitish, but with nacreous luster.

Operculum - trapdoor or plate which closes the aperture of gastropod shells and isolates the snail from its surrounding environment. Opercula can be horny ('soft', brownish) or calcareous ('hard', usually whitish).

Outer lip - edge of the external part of the aperture away from the shell axis.

Ovate - characteristic of having the form of an egg.

Oval - same as ovate.

Parietal - region of the internal part of the aperture, usually set apart by differences in surface texture and/or coloration.

Parietal shield - parietal region when markedly different from the remainder of the adjacent shell area.

Periphery - region of the outermost part of any given whorl on the gastropod shell. The shell periphery is therefore the greatest circumference of the gastropod shell.

Periostracum - layer of the outside part of the shell. It is horny and sometimes hair-like.

Peristome - aperture rim or periphery.

Plication - same as fold.

Posterior - region away from the siphonal canal, near the apex, in gastropods; in bivalves, the region of the shell sinus, away from the foot.

Posterior canal - canal of small size or notch opposite to the siphonal canal on the aperture of the gastropod shell.

Protoconch - larval shell remaining on the apex of well-preserved gastropod shells.

Radial - structures that are directed away from the apex toward the shell margin, in limpets.

Radiating - same as radial.

Reticulate - feature of shell sculpture consisting of criss-crossed, net-like texture formed by the intersection of lines at right angles.

Reticulated - same as reticulate.

Ribbon - surface consisting of an aligned sequence of egg-cases.

Ribs - strucutural elements forming a well-defined, narrow ridge in gastropod shells. Term usually applied to those elements forming a plane with (or slightly oblique to) shell axis.

Riblets - diminutive of ribs.

Scales - sculptural elements that are small, raised, and plate-like.

Septum - partition found in the internal side of gastropod shells; characteristic of slipper-shells.

Serrated - resembling tiny saw teeth.

Shoulder - angled region of the whorls of gastropod shells.

Siphon - prolongation of the gastropod mantle used to convey water into the mantle cavity.

Siphonal canal - projection of the anterior region shell in tubular form protecting the anterior siphon.

Snails - common name of gastropods.

Spiral - direction following the coiling of the gastropod shell. Term usually applied as a modifier to sculptural terms such as ‘spiral cords’.

Spire - series of successive whorls in a gastropod shell, with exception of the last one.

Spire angle - angle formed by the lines defined by the outermost points on both sides of the spire.

Striation - fine, repeated lines or furrows on shell surface.

Suture - line or region of junction between two adjacent whorls in the gastropod shell.

Synonym - a scientific name applied to a species that has received an earlier name. OBS: Usually, the earlier name is the valid one.

Thread - same as line.

Top of the shell - same as apex.

Turbinate - form that looks top-shaped, tapering evenly from base to apex.

Turreted - form that looks tower-shaped, elongate.

Umbilicus - cavity at base of gastropod shells.

Uncoiled - gastropod shell that lacks coiling.

Varix - axial sculptural element that is more prominent than a costa, and usually more widely spaced; evidence of a growth halt during which a thickened lip develops (plural: varices).

Ventral - region of the animal opposed to the dorsal region; region of the foot in gastropods.

Whorl - a complete turn or coil of the gastropod shell.

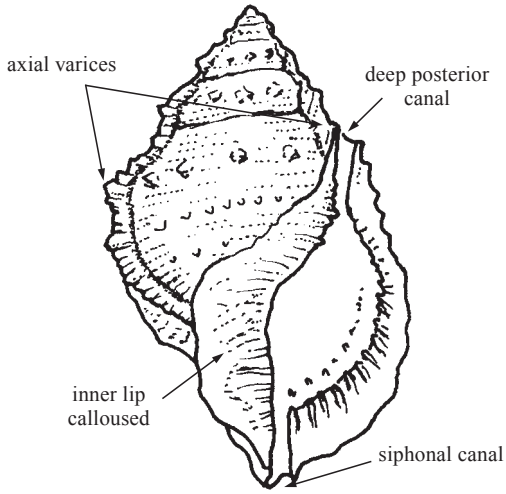
GUIDE TO FAMILIES OCCURRING IN THE AREA

The following guide is intended to facilitate the identification of marine or brackish-water gastropod families regularly exploited or occasionally found in markets of the area. Additionally included are those families that are similar to exploited families but do not contain species that are regularly utilized. The families in this guide represent only a small part of the gastropod fauna occurring in the area, and it is probable that their number will increase once we have better information on the fisheries and utilization of this group of resources.

BURSIDAE

Frog shells

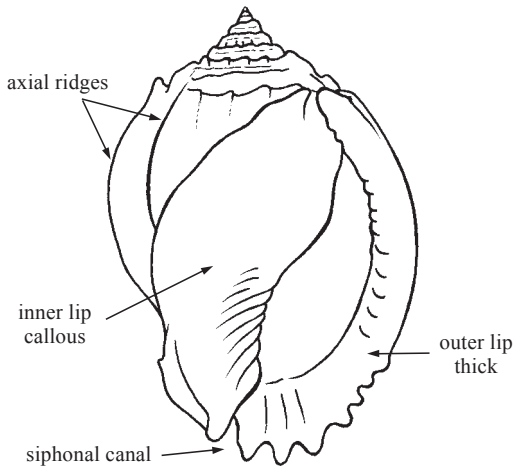
No species of interest to fisheries in the area.



CASSIDAE **p. 113**

Helmet and bonnet shells

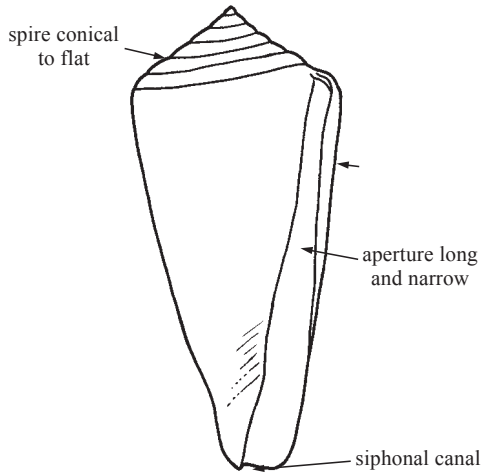
Three species of interest to fisheries in the area.



CONIDAE

Cone shells

No species of interest to fisheries in the area.

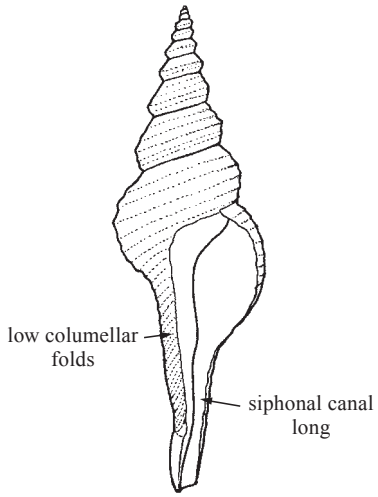


FASCIOLARIIDAE

p. 117

Horse conchs, spindle shells

Two species of interest to fisheries in the area.

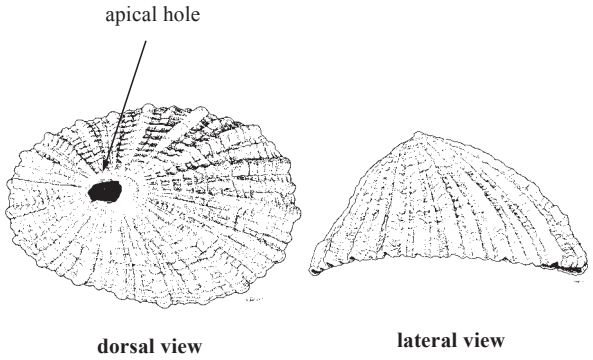


FISSURELLIDAE

p. 120

Keyhole limpets

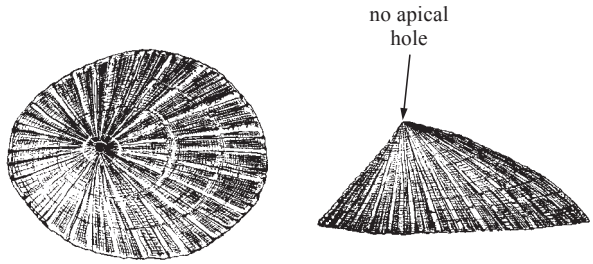
Three species of interest to fisheries in the area.



LOTTIIDAE

Lottiid limpets

No species of interest to fisheries in the area.



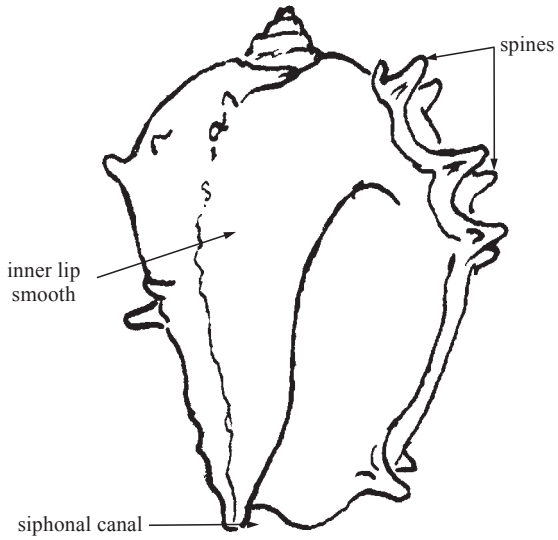
dorsal view **lateral view**

MELONGENIDAE

p. 124

Melongenas

Four species of interest to fisheries in the area.

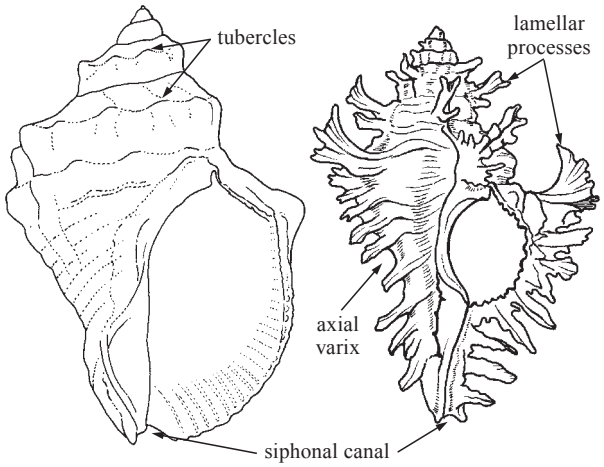


MURICIDAE

p. 128

Purpuras, murex, and rock shells

Three species of interest to fisheries in the area.

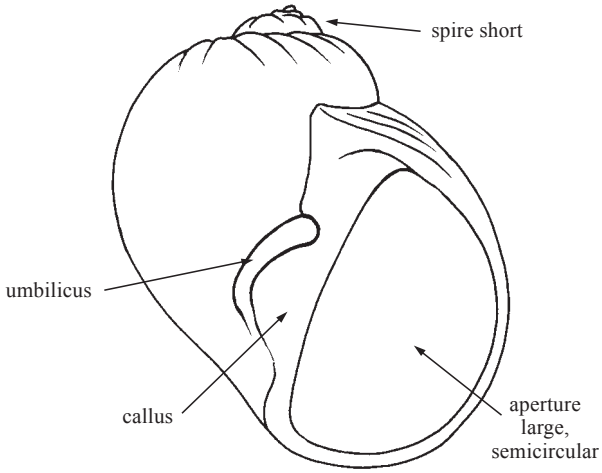


examples showing diversity of shape

NATICIDAE

Moon snails

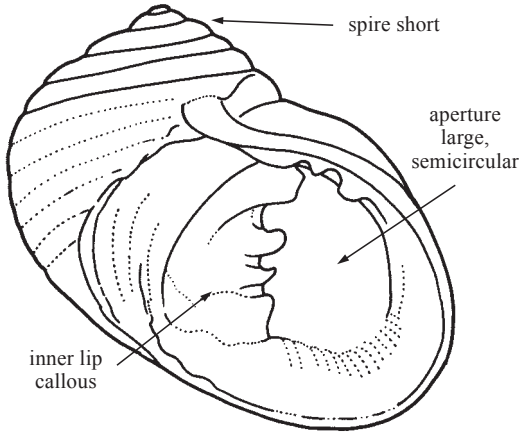
No species of interest to fisheries in the area.



NERITIDAE **p. 133**

Nerites

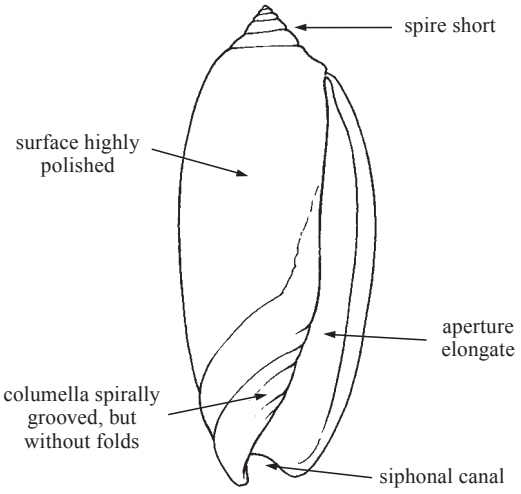
One species of interest to fisheries in the area.



OLIVIDAE

Olive shells

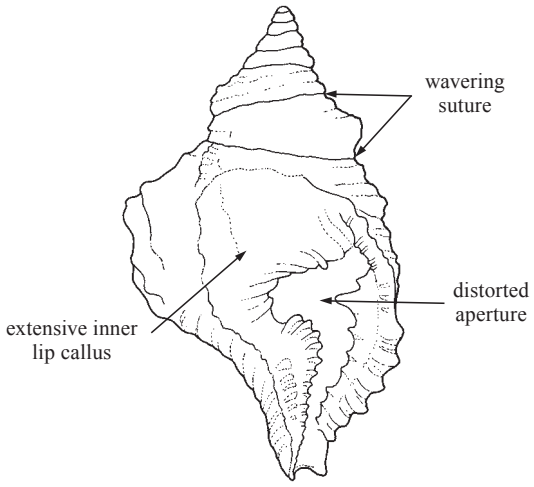
No species of interest to fisheries in the area.



PERSONIDAE

Distorsios

No species of interest to fisheries in the area.

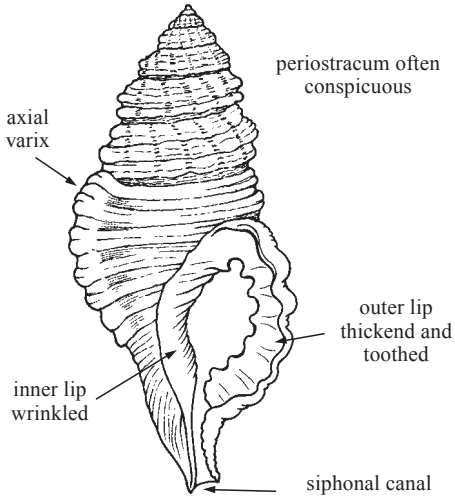


RANELLIDAE

p. 135

Triton shells

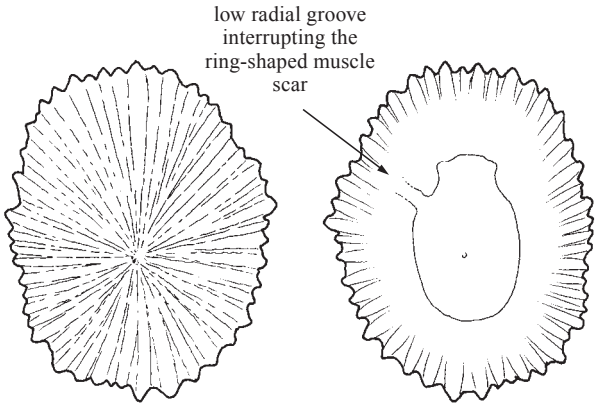
One species of interest to fisheries in the area.



SIPHONARIIDAE

False limpets

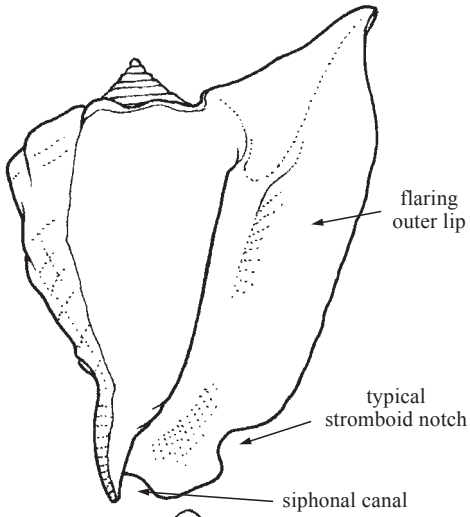
No species of interest to fisheries in the area.



STROMBIDAE **p. 137**

Conchs

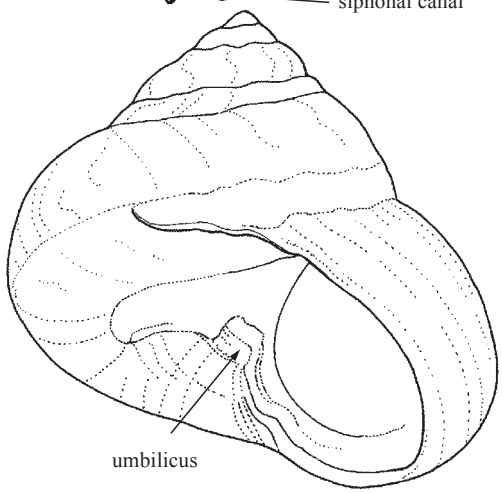
Three species of interest to fisheries in the area.



TROCHIDAE **p. 141**

Top shells

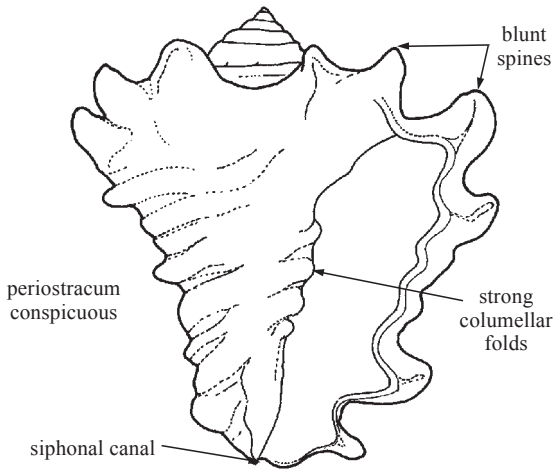
One species of interest to fisheries in the area.



TURBINELLIDAE **p. 143**

Vase shells

One species of interest to fisheries in the area.

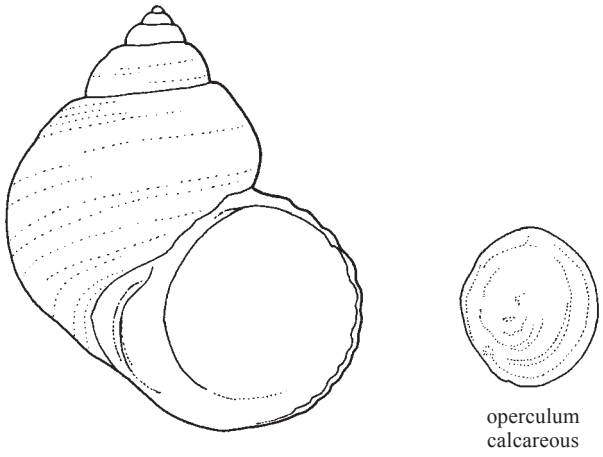


TURBINIDAE

p. 145

Turban shells

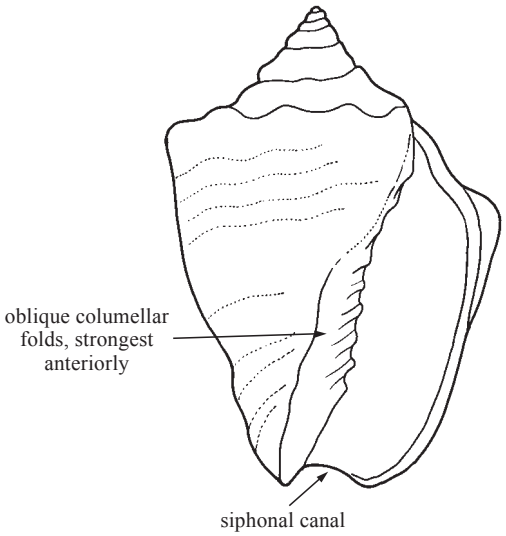
One species of interest to fisheries in the area.



VOLUTIDAE

Volutes

No species of interest to fisheries in the area.



LIST OF FAMILIES AND SPECIES OF INTEREST TO FISHERIES OCCURRING IN THE AREA

The symbol is given when species accounts are included.

CASSIDAE
- *Cassis flammea* (Linnaeus, 1758).
- *Cassis madagascariensis* Lamarck, 1822.
- *Cassis tuberosa* (Linnaeus, 1758).

FASCIOLARIIDAE
- *Fasciolaria tulipa* (Linnaeus, 1758).
- *Pleuroploca gigantea* (Kiener, 1840).

FISSURELLIDAE
- *Diodora listeri* (d'Orbigny, 1842).
- *Fissurella barbadensis* (Gmelin, 1791).
- *Fissurella nimbosa* (Linnaeus, 1758).

MELONGENIDAE
- *Busycon perversum* (Linnaeus, 1758).
- *Melongena corona* (Gmelin, 1791).
- *Melongena melongena* (Linnaeus, 1758).
- *Pugilina morio* (Linnaeus, 1758).

MURICIDAE
- *Chicoreus brevifrons* (Lamarck, 1822).
- *Chicoreus pomum* (Gmelin, 1791).
- *Stramonita haemastoma* (Linnaeus, 1767).

NERITIDAE
- *Nerita peloronta* Linnaeus, 1758.

RANELLIDAE
- *Charonia variegata* (Lamarck, 1816).

STROMBIDAE
- *Strombus costatus* Gmelin, 1791.
- *Strombus gigas* Linnaeus, 1758.
- *Strombus pugilis* Linnaeus, 1758.

TROCHIDAE
- *Cittarium pica* (Linnaeus, 1758).

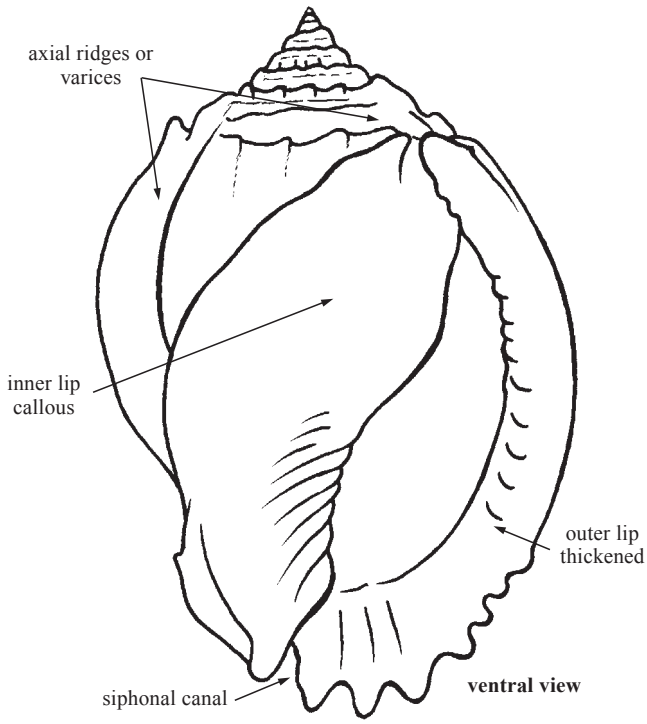
TURBINELLIDAE
- *Turbinella angulata* (Lightfoot, 1786).

TURBINIDAE
- *Turbo castanea* Gmelin, 1791.

CASSIDAE

Helmet and bonnet shells

Diagnostic characters: Shell large, thick, heavy, with sculpture usually nodulose, spire usually small. Anterior canal curved dorsally, parietal shield well developed, with thick callus. Varices present.



Habitat, biology, and fisheries: Subtidal, in sandy bottoms. Consumed locally. Shells of the species are sold as souvenirs throughout the area.

Similar families occurring in the area

None.

List of species of interest to fisheries occurring in the area

The symbol is given when species accounts are included.

- *Cassis flammea* (Linnaeus, 1758).
- *Cassis madagascariensis* Lamarck, 1822.
- *Cassis tuberosa* (Linnaeus, 1758).

References

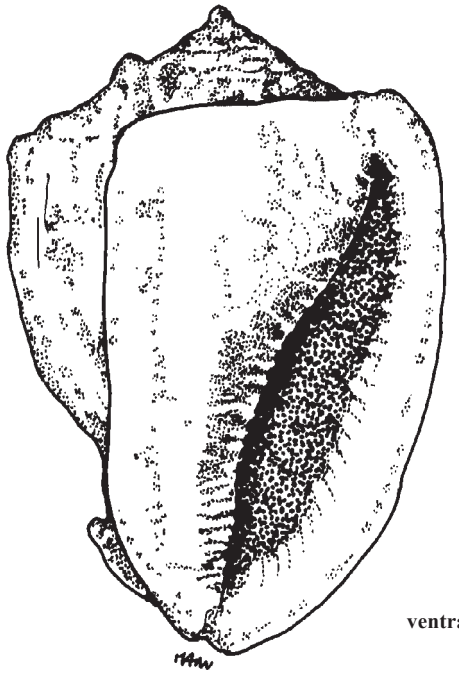
Abbott, R.T. 1968. The helmet shells of the world (Cassidae). Part 1. *Indo-Pacific Mollusca*, 2(9):7-202.

Kreipl, K. 1997. *Recent Cassidae*. Verlag Christa Hemmen, Wiesbaden, 151 p.

Cassis flammea (Linnaeus, 1758) KSF

Frequent synonyms / misidentifications: None / *Cassis tuberosa* (Linnaeus, 1758); *Cassis madagascariensis* Lamarck, 1822

FAO names: En - Flame helmet; **Fr** - Casque flamme; **Sp** - Casco flameante.



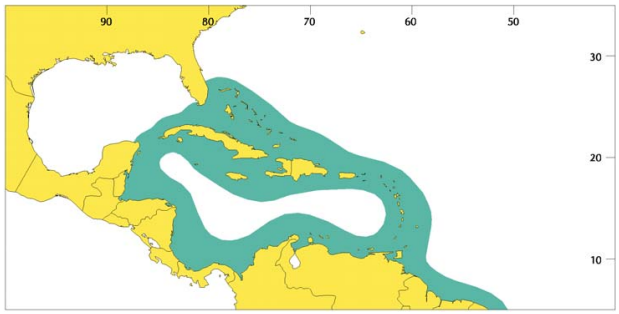
ventral view

Diagnostic characters: Shell large, heavy. Spire short. Shell surface smooth, except for knobby projections on body whorl. Parietal shield large and well defined, oval. Outer lip with inner tooth-like projections. **Colour:** brownish cream with large patch of brown at centre of parietal shield. Outer lip entirely cream or cream-white.

Size: To 75 mm.

Habitat, biology, and fisheries: On sand bottoms near seagrass beds, at shallow subtidal depths. Collected by diving. Shells sold as collectibles or souvenirs in parts of the area.

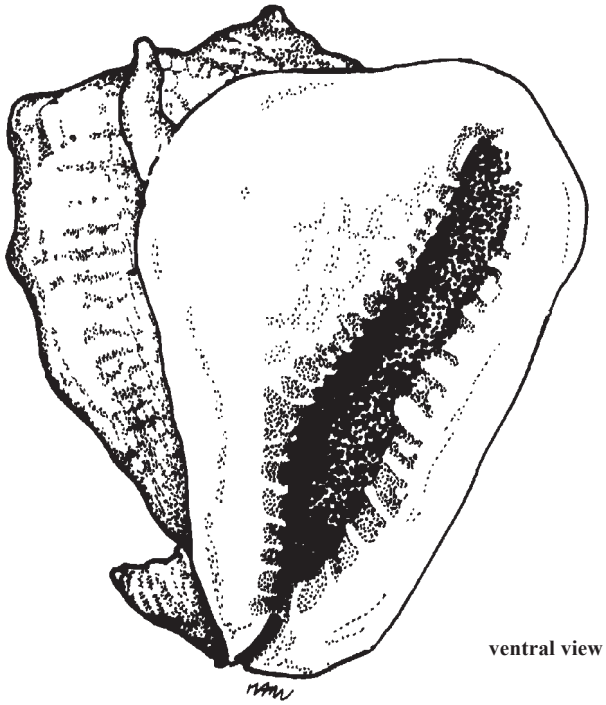
Distribution: Lower Florida Keys, Caribbean to Brazil, and Bermuda.



Cassis madagascariensis Lamarck, 1822 KSD

Frequent synonyms / misidentifications: None / *Cassis flammea* (Linnaeus, 1758); *Cassis tuberosa* (Linnaeus, 1758).

FAO names: En - Emperor helmet (AFS: Cameo helmet); **Fr** - Casque impérial; **Sp** - Casco imperial.



ventral view

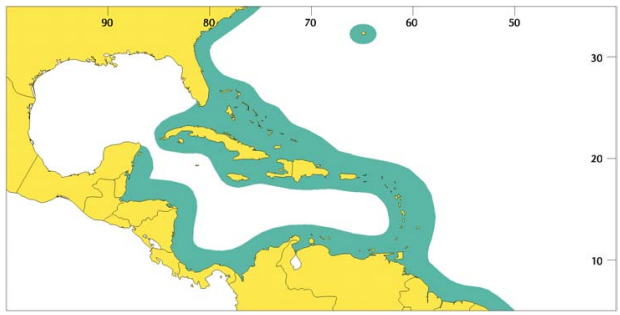
Diagnostic characters: Shell very large, heavy. Spire short. Shell surface with 3 rows of large knobs on body whorl. Parietal shield large and well defined, triangular. Outer lip with inner tooth-like projections. **Colour:** pale cream, parietal shield pale to deep salmon. Outer lip entirely cream or cream white sometimes with light brown between teeth.

Size: To 350 mm.

Habitat, biology, and fisheries: On sand bottoms near seagrass beds, at shallow subtidal depths. Collected by diving. Shells sold as collectibles or souvenirs in parts of area.

Distribution: North Carolina to Florida, Greater Antilles, and Bermuda.

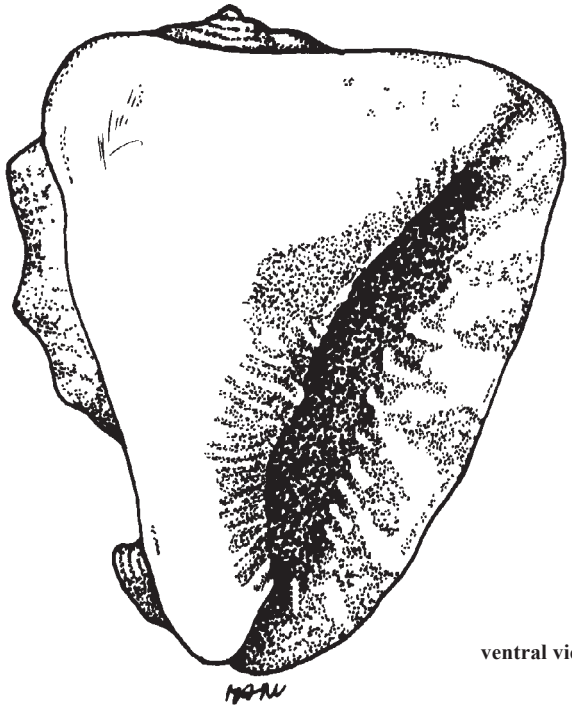
Remarks: Largest species of the family in the Atlantic Ocean.



Cassis tuberosa (Linnaeus, 1758) KST

Frequent synonyms / misidentifications: None / *Cassis flammea* (Linnaeus, 1758); *Cassis madagascariensis* Lamarck, 1822.

FAO names: En - King helmet (AFS: Caribbean helmet); **Fr** - Casque royal; **Sp** - Casco real.



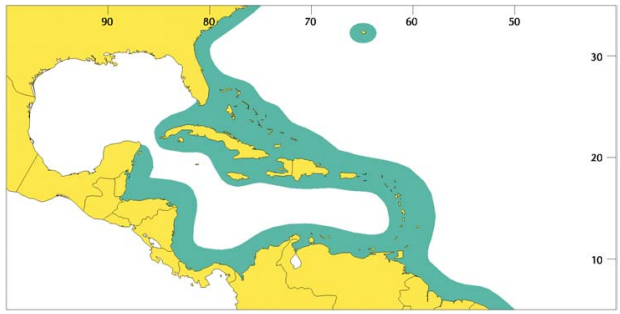
ventral view

Diagnostic characters: Shell very large, heavy. Spire short. Shell surface with fine reticulated sculpture and knobby projections on body whorl. Parietal shield large and well defined, triangular. Outer lip with inner tooth-like projections. **Colour:** brownish cream with large patch of brown at centre of parietal shield. Outer lip entirely cream or cream white with brown between teeth.

Size: To 250 mm.

Habitat, biology, and fisheries: On sand bottoms (sometimes buried) near seagrass beds, at shallow subtidal depths. Collected by diving. Shells sold as collectibles or souvenirs in parts of the area.

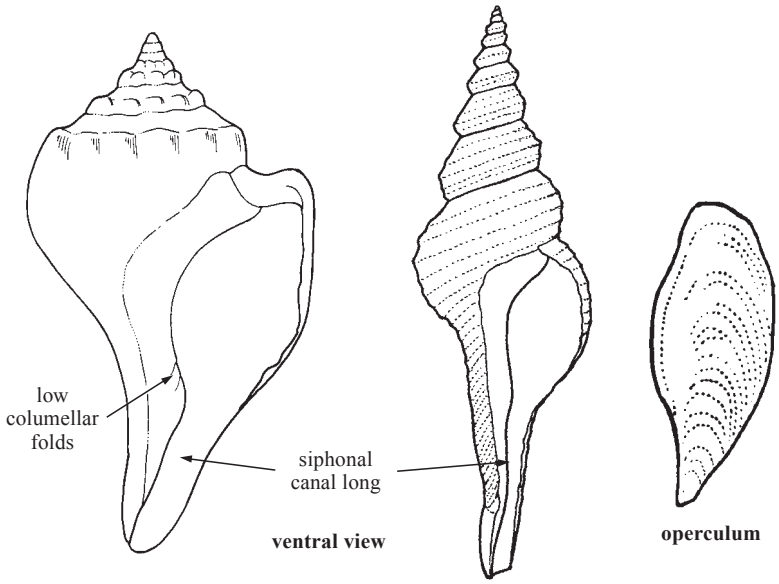
Distribution: North Carolina to Florida, Caribbean to Brazil, and Bermuda.



FASCIOLARIIDAE

Horse conchs (spindle shells, tulips)

Diagnostic characters: Shell large, elongate, spindle-shaped, spire elevated, anterior canal well developed. Columellar folds present. Operculum thick and horny. **Colour:** usually red or orange.



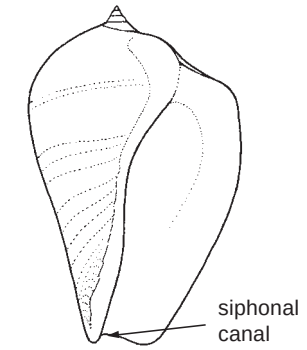
examples showing diversity of shape

Habitat, biology, and fisheries: Subtidal, in sandy bottoms. Soft parts of species of interest to fisheries. Consumed locally.

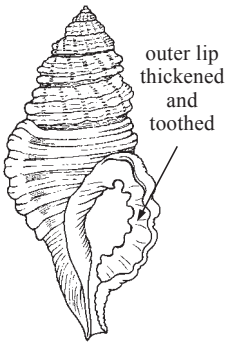
Similar families occurring in the area

Melongenidae: shell pear-shaped to fusiform, usually with sculpture of spines or nodules on shoulder; periostracum usually thick; parietal shield usually smooth; operculum claw-shaped, heavey, horny.

Ranellidae: shell usually large, heavy, sculpture a combination of strong spiral elements such as cords and axial varices; outer lip internally with strong indentations; periostracum sometimes very well developed, hairy, or fringe-like; operculum heavy, horny.



Melongenidae



Ranellidae

List of species of interest to fisheries occurring in the area

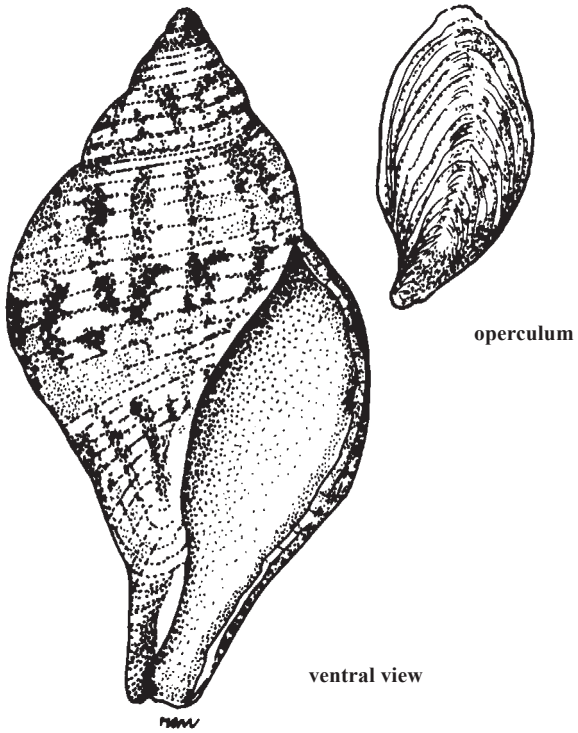
The symbol is given when species accounts are included.

- *Fasciolaria tulipa* (Linnaeus, 1758).
- *Pleuroploca gigantea* (Kiener, 1840).

Fasciolaria tulipa (Linnaeus, 1758) FST

Frequent synonyms / misidentifications: None / None.

FAO names: En - True tulip; **Fr** - Fasciolaire tulipe; **Sp** - Tulipán verdadero.

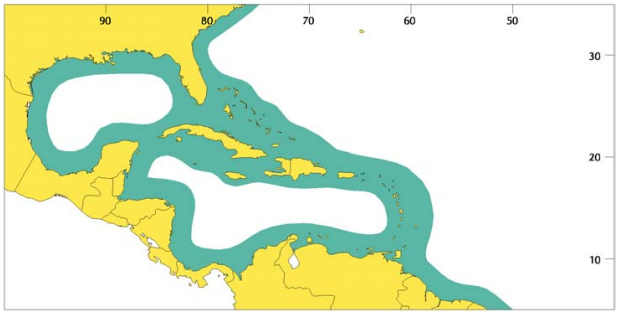


Diagnostic characters: Shell fusiform with about 9 rounded whorls. Surface smooth, except for very fine growth lines. Outer lip thin, with fine denticles on inner edge. Operculum thick, heavy. **Colour:** extremely variable, cream, light brown, to reddish orange with irregular blotches of darker brown, white, or cream. Brown spiral lines present. Living animal is bright orange.

Size: To 200 mm.

Habitat, biology, and fisheries: On seagrass bottoms and sand flats. Collected by divers, consumed locally raw or boiled.

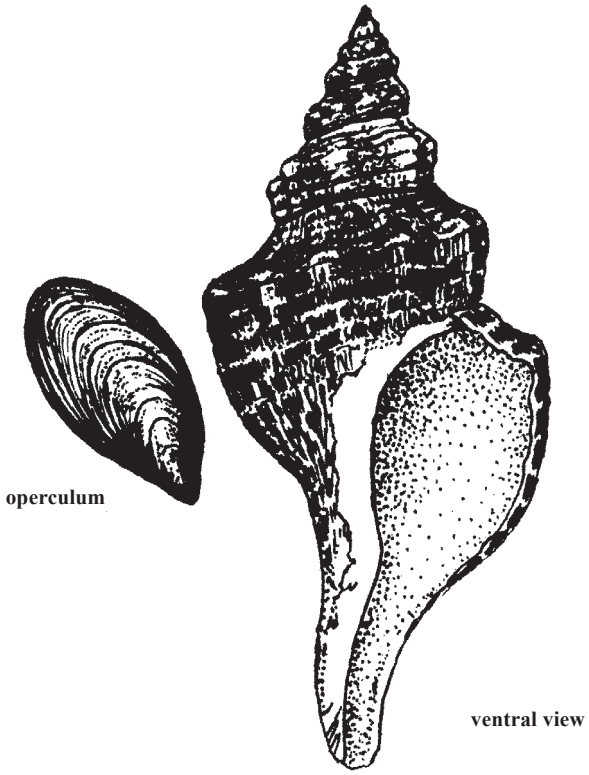
Distribution: North Carolina through Florida to Texas, and Caribbean to Brazil.



Pleuroploca gigantea (Kiener, 1840)

Frequent synonyms / misidentifications: None / *Turbinella angulata* (Lightfoot ,1786).

FAO names: En - Florida horse conch (AFS: Horse conch); **Fr** - Pleuroploque géant; **Sp** - Concha gigante.



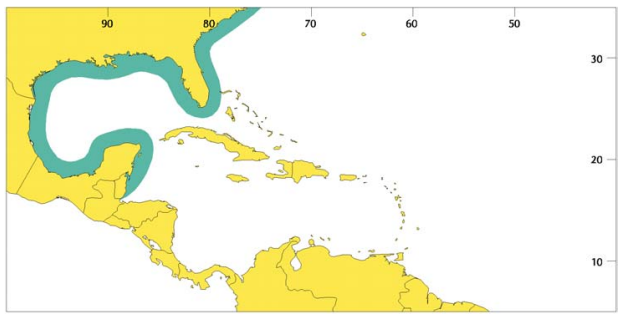
Diagnostic characters: Shell large, with up to 10 whorls. Sculpture of about 5 to 7 spiral cords and weak axial ribs that sometimes form knobs on whorl shoulders. Columella with 3 plications. Periostracum sometimes flaky. **Colour:** shell greyish white to salmon orange, usually orange in younger specimens; periostracum dark brown to light tan.

Size: To 600 mm.

Habitat, biology, and fisheries: Intertidal to shallow subtidal, on sand and mud flats and seagrass beds. Broad, muscular foot is locally consumed in northwestern Mexico.

Distribution: North Carolina through Florida to Texas and Gulf of Mexico to Yucatán.

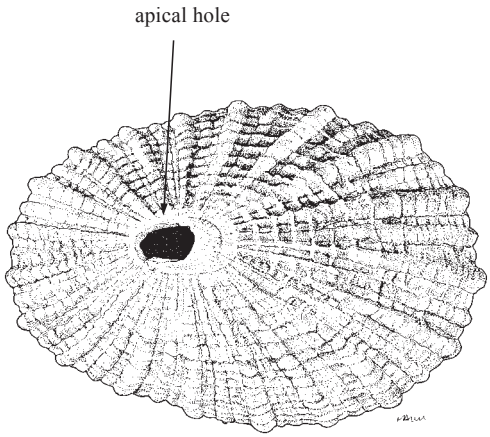
Remarks: This is the largest gastropod in American waters, and the Florida State Shell. A variety lacking nodules known as 'knobless wonder' can be found in southwestern Florida.



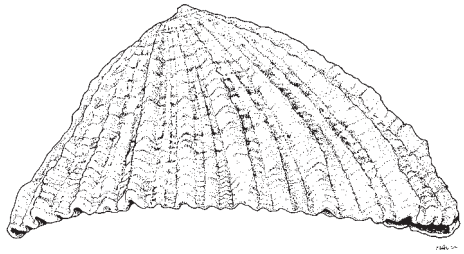
FISSURELLIDAE

Keyhole limpets

Diagnostic characters: Shell conical, usually with apical hole, sometimes with anterior slit. Shell sculpture usually radial, sometimes crossed by concentric elements. Shell internally glossy, porcellanous. Shell muscle (and scar on shell) horseshoe-shaped.



dorsal view



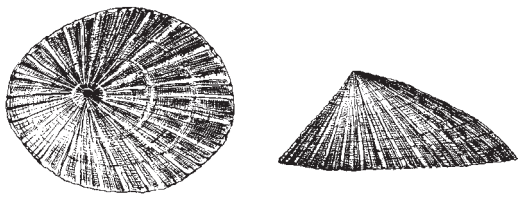
lateral view

Habitat, biology, and fisheries: On rocky coasts or other intertidal or shallow subtidal hard substrates. Consumed locally, boiled.

Similar families occurring in the area

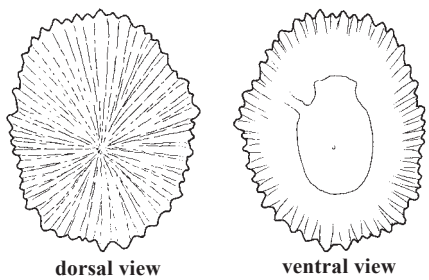
Lottiidae: shell conical, sculpture essentially radial; interior with horseshoe-shaped muscle scar; no operculum; a single true gill in the mantle cavity.

Siphonariidae: easily distinguishable from most Fissurellidae by lack of apical hole; differ anatomically by the presence of a single true gill in the mantle cavity.



dorsal view lateral view

Lottiidae



dorsal view ventral view

Siphonariidae

List of species of interest to fisheries occurring in the area

The symbol is given when species accounts are included.

- *Diodora listeri* (d'Orbigny, 1842).
- *Fissurella barbadensis* (Gmelin, 1791).
- *Fissurella nimbosa* (Linnaeus, 1758).

References

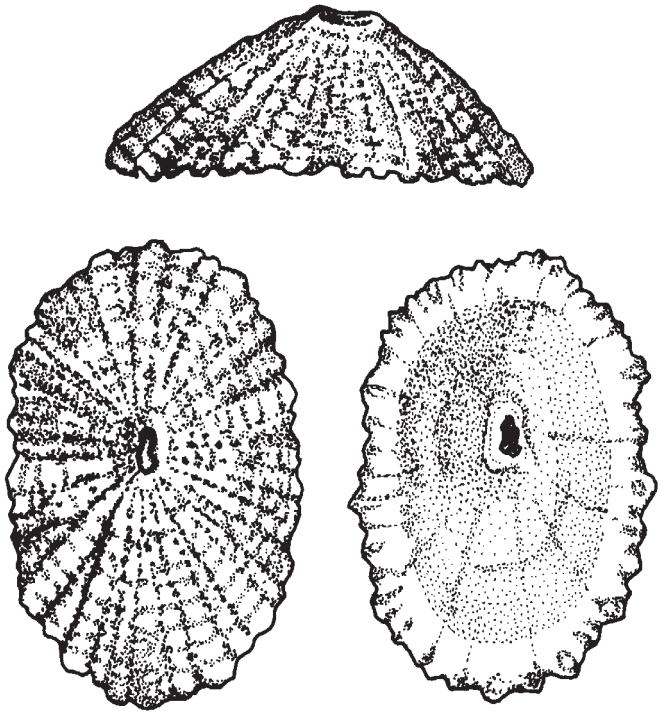
Farfante, I.P. 1943a. The genera *Fissurella, Lucapina* and *Lucapinella* in the western Atlantic. *Johnsonia*, 1(10):1-20.

Farfante, I.P. 1943b. The genus *Diodora* in the western Atlantic. *Johnsonia*, 1(11):1-20.

Diodora listeri (d'Orbigny, 1842) DDL

Frequent synonyms / misidentifications: None / *Diodora cayenensis* (Lamarck, 1822), *Fissurella barbadensis* (Gmelin, 1791).

FAO names: En - Lister's keyhole limpet; **Fr** - Fissurelle de Lister; **Sp** - Fisurela de Lister.

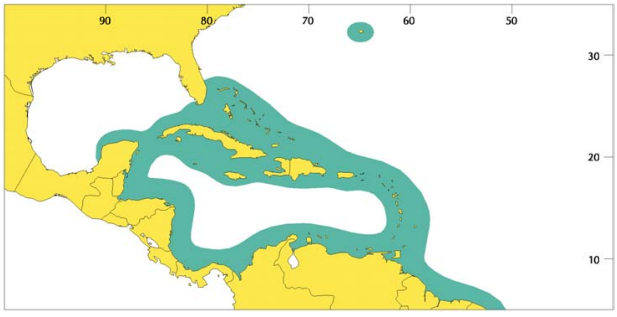


Diagnostic characters: Shell of medium size, elliptical. Sculpture of alternating large and small ribs, with a riblet in the interspaces (total of 3 rib sizes) crossed by distinct concentric cords. Margin crenulated. Orifice keyhole-shaped. Distinguished from *Diodora cayenensis* by much coarser sculpture and alternating large and small radial ribs. **Colour:** cream to grey with darker radial bands.

Size: To 45 mm.

Habitat, biology, and fisheries: On rocky and other hard substrates, present in coral reef environments. Consumed locally, boiled.

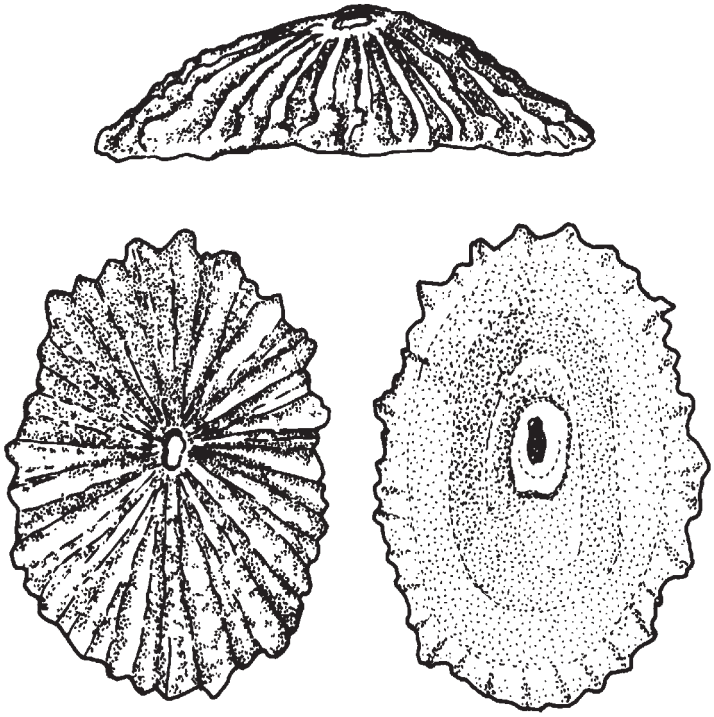
Distribution: Southern Florida, Caribbean, to Brazil, and Bermuda.



Fissurella barbadensis (Gmelin, 1791) FSB

Frequent synonyms / misidentifications: None / *Diodora listeri* (d'Orbigny, 1842)

FAO names: En - Barbados keyhole limpet; **Fr** - Fissurelle de Barbados; **Sp** - Lapa de Barbados.

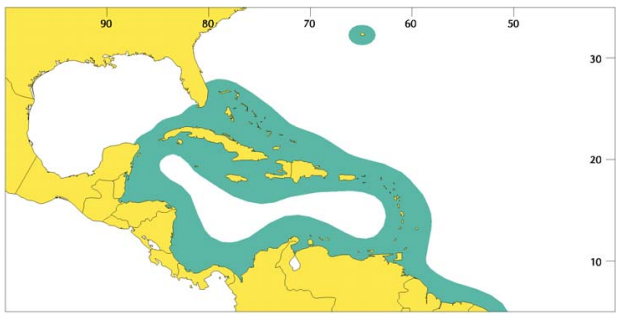


Diagnostic characters: Shell of medium size, elliptical. Sculpture of irregular, coarse, radial ribs. Margin irregular. Orifice almost circular. **Colour:** greyish to pinkish white, usually with purplish blotches and lines between ribs. Internally with green and whitish concentric bands. Border of orifice internally deep green.

Size: To 38 mm.

Habitat, biology, and fisheries: Intertidal on rocky substrates. Consumed locally boiled or in stews.

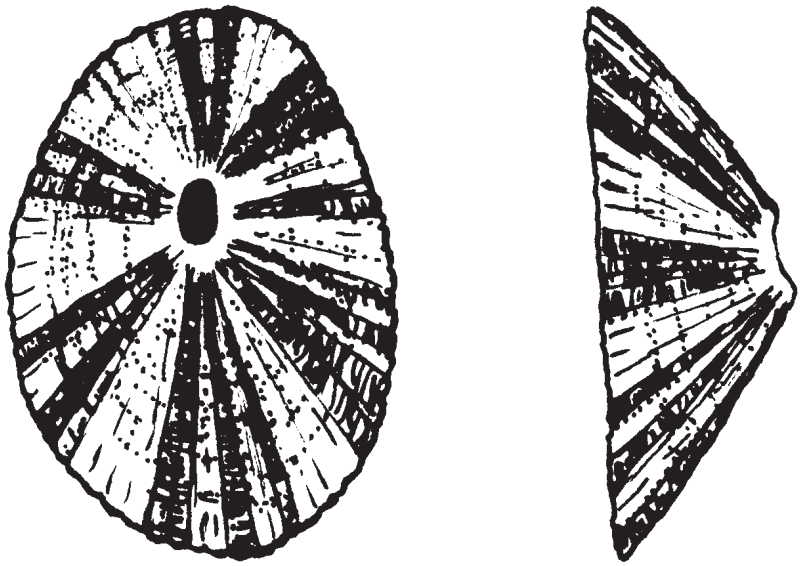
Distribution: Southern Florida, Caribbean, to Brazil; Bermuda.



Fissurela nimbosa (Linnaeus, 1758) FSM

Frequent synonyms / misidentifications: None / None.

FAO names: En - Rayed keyhole limpet; **Fr** - Fissurelle rayonnante; **Sp** - Lapa radiante.

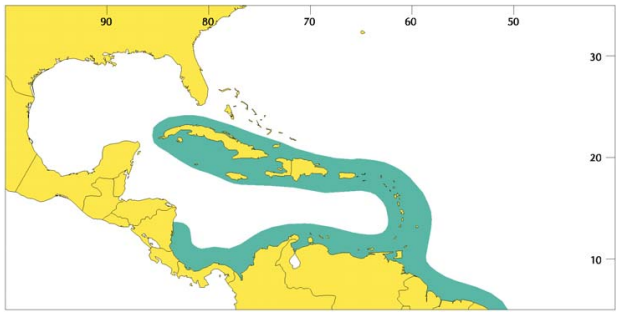


Diagnostic characters: Shell of medium size, elliptical. Sculpture of irregular, radial grooves and narrow, flat ribs, all crossed by fine lines. Margin irregular. Orifice oblong, large, with sides bearing small upward projections. **Colour:** greyish to pinkish white, usually with purplish blotches and lines between ribs. Internally with green and whitish concentric bands. Border of orifice internally deep green.

Size: To 37 mm.

Habitat, biology, and fisheries: On hard substrates. Consumed locally, boiled or in stews.

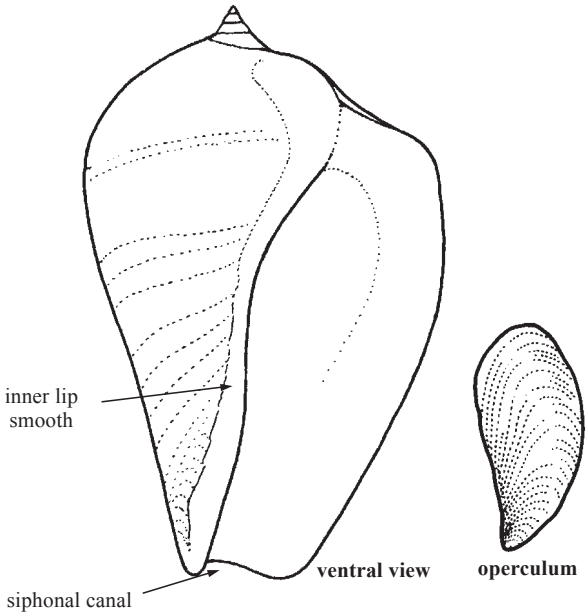
Distribution: Greater Antilles and Caribbean to Brazil.



MELONGENIDAE

Melongenas (whelks, crown conchs)

Diagnostic characters: Shell pear-shaped to fusiform, usually with sculpture of spines or nodules on shoulder. Periostracum usually thick. Parietal shield usually smooth. Operculum claw-shaped, heavy, horny.

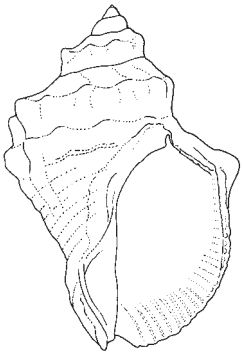


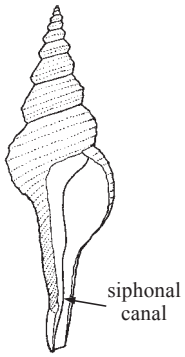
Habitat, biology, and fisheries: Intertidal or shallow subtidal in protected bays, mud flats, or mangrove habitats. Most species of interest to fisheries, consumed locally boiled.

Similar families occurring in the area

Muricidae: shell usually with high spire, shell sculpture with prevailing axial elements such as varices (usually placed at 120° intervals), spines, nodules, lamellae, and others; anterior canal usually well developed; periostracum lacking; operculum thick, horny.

Fasciolariidae: shell large, elongate, spindle-shaped, spire elevated, anterior canal well developed; columellar folds present; operculum thick and horny.


Muricidae



Fasciolariidae

List of species of interest to fisheries occurring in the area

The symbol is given when species accounts are included.

- *Busycon perversum* (Linnaeus, 1758).
- *Melongena corona* (Gmelin, 1791).
- *Melongena melongena* (Linnaeus, 1758).
- *Pugilina morio* (Linnaeus, 1758).

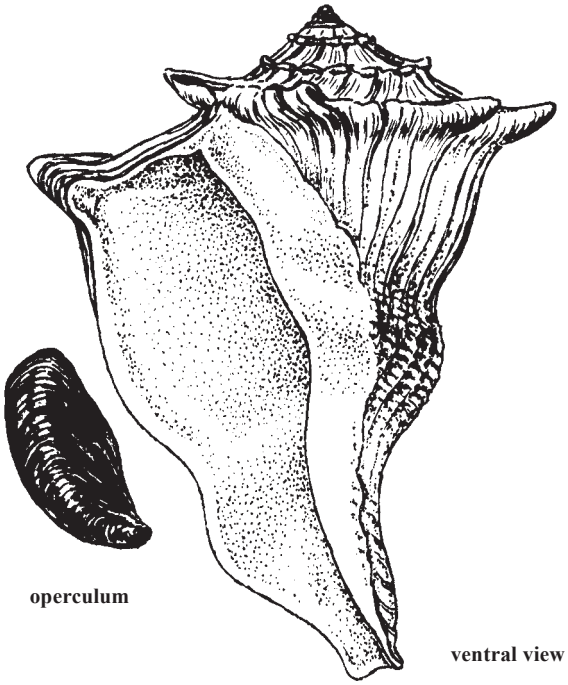
Reference

Edwards, A.L. and M.G. Harasewych. 1988. Biology of the Recent species of the subfamiliy Busyconinae. *J. Shellfish Res.*, 7:467-472.

Busycon perversum (Linnaeus, 1758) WHX

Frequent synonyms / misidentifications: None / None.

FAO names: En - Perverse whelk; **Fr** - Busycon peverse; **Sp** - Busicón peverso.



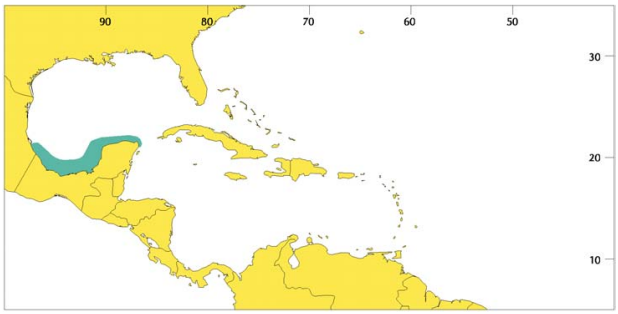
Diagnostic characters: Shell left-handed (or sinistral, coiling to left), heavy, with flattened spire. Shell shoulders with small knobs. **Colour:** tan, shells under 18 cm have axial brown streaks.

Size: To 400 mm.

Habitat, biology, and fisheries: Very common on mud flats and protected bay waters.

Distribution: Campeche to Yucatán, Mexico.

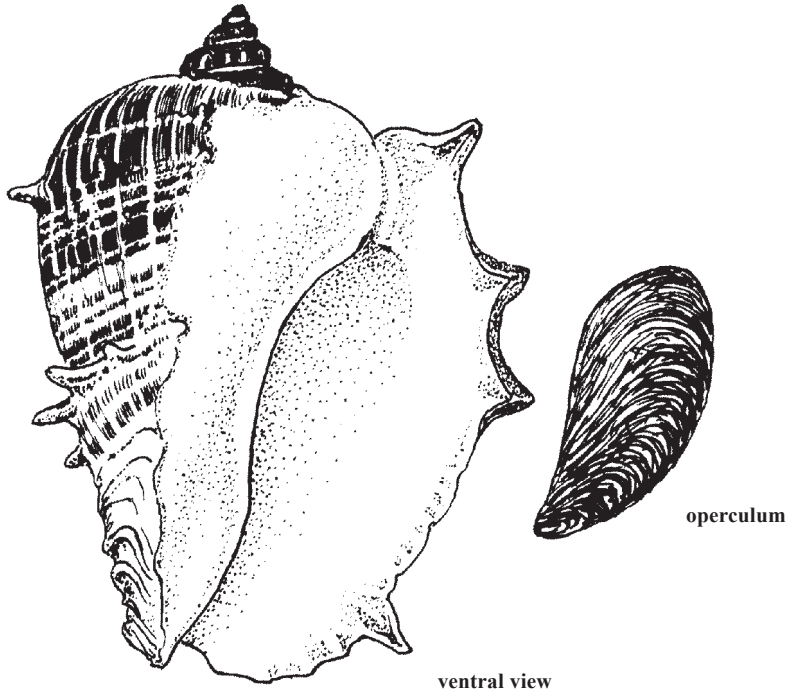
Remarks: May be conspecific with *Busycon sinistrum* Hollister, 1958, from the USA Gulf states and east coast.



Melongena melongena (Linnaeus, 1758) NGK

Frequent synonyms / misidentifications: None / None.

FAO names: En - West Indian crown conch (AFS: Crown conch); **Fr** - Mélongène des Caraïbes; **Sp** - Melongena antillana.

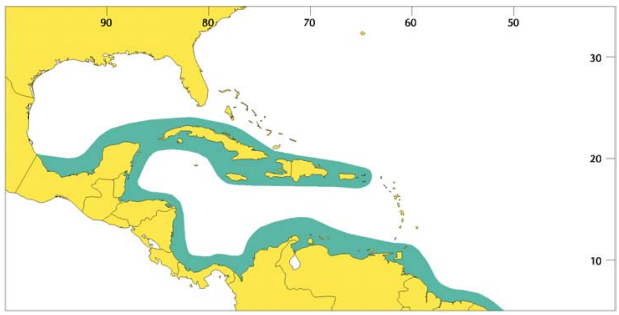


Diagnostic characters: Shell thick, pear-shaped, with large body whorl. Spire short, last few whorls bear single or double rows of spines. Suture deeply channelled. Anterior canal short and broad. Base of shell sometimes with a row of smaller, blunt spines. **Colour:** purplish brown, light grey, or white, with bluish, brownish, or greyish bands.

Size: To 150 mm.

Habitat, biology, and fisheries: Inhabits coastal lagoons, mangroves, river estuaries, and other low-salinity environments. Hand-collected at low tide or by divers. Consumed locally. Shell marketed as ornament or a collectible.

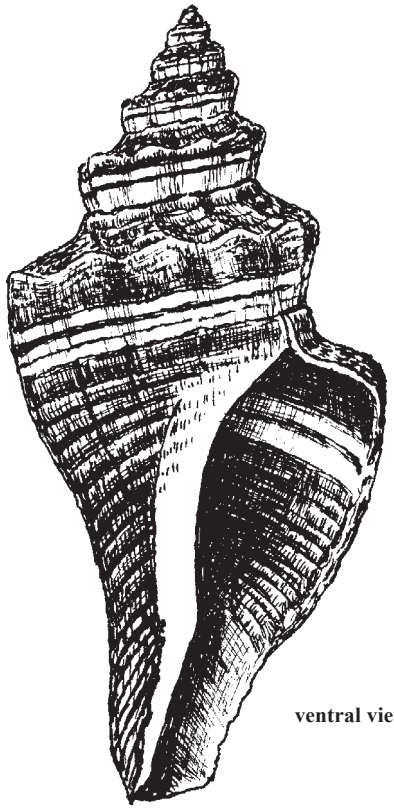
Distribution: Caribbean.



Pugilina morio (Linnaeus, 1758) UGO

Frequent synonyms / misidentifications: None / None.

FAO names: En - Giant hairy melongena (AFS: Hairy melongena); **Fr** - Mélongène noir; **Sp** - Melongena negra.



ventral view

Diagnostic characters: Shell fusiform, spire high, anterior canal well developed, shell surface with sculpture of many fine spiral threads. Shoulder angular, with single row of nodules. Periostracum thick and hairy. **Colour:** chocolate brown to black, with a few contrasting white bands, periostracum brownish.

Size: To 160 mm.

Habitat, biology, and fisheries: Lives on mud and other soft substrates in mangrove areas and near river estuaries. Feeds mainly on carrion.

Distribution: Trinidad and Tobago to Brazil, and tropical West Africa.