

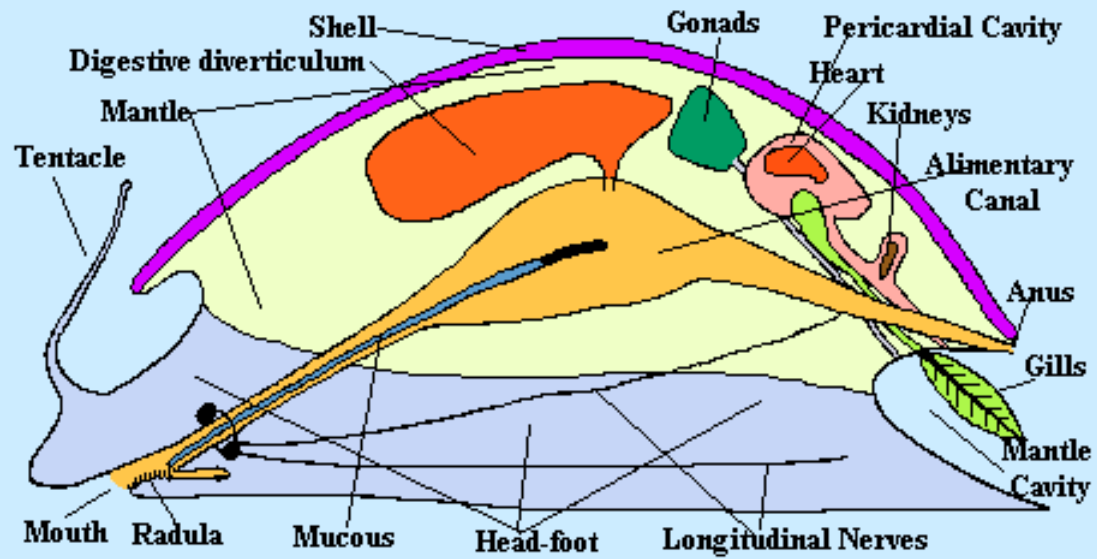
# Phylum Mollusca

BI103 Marine Biology  
Laboratory Notes 06

- *mollis* from Latin = soft
- Molluscs are soft-bodied invertebrates
- Molluscs exhibit extreme diversity in external body plan
- The Mollusca is the second largest phylum of animals, with more than 110,000 species described

# General Characteristics

- 1) Bilateral symmetry
- 2) Body mass (or visceral mass)
- 3) Protective armor (usually a dorsal shell)
- 4) Head, with sensory and feeding organs
- 5) Muscular ventral foot for locomotion





# Specialized structures

- Two structures are unique to the Mollusca
  - 1) **Mantle** = extension of the visceral mass
    - Extends outward and downward to form a mantle cavity between its outermost edge and the visceral mass
  - 2) **Radula** = Latin for *scraper*
    - Can be considered a “toothed tongue”

# Functions of the Mantle

- 1) Secretes the molluscan shell, increasing it in size and strength
- 2) Houses respiratory surfaces (i.e., gills or “lung”)
  - a) Mantle cavity is lined with cilia that pass water current over the respiratory surfaces
  - b) Current also eliminates fecal matter, excretory products, and reproductive material

- 3) Houses external openings of digestive, excretory, and reproductive systems
- 4) Houses olfactory sensory organs
- 5) Provides space
  - a) Head and foot can be retracted into mantle cavity for protection
  - b) Forms a brood pouch in some species
  - c) Is modified into jet propulsion organ in squids and octopuses

# Radula

- The radula essentially consists of up to 250,000 teeth attached to a flexible, chitinous membrane, mounted on a cartilaginous rod
- The radula is extended from the mouth and “licked” or scraped across the surface upon which the mollusc is feeding (i.e., like a rasp)



- The radula may be modified for different feeding strategies
  - Drill
    - (e.g., moon snails and some muricids)
  - Dart
    - (e.g., *Conus*, some turrids and terebrids)
  - Reduced or absent

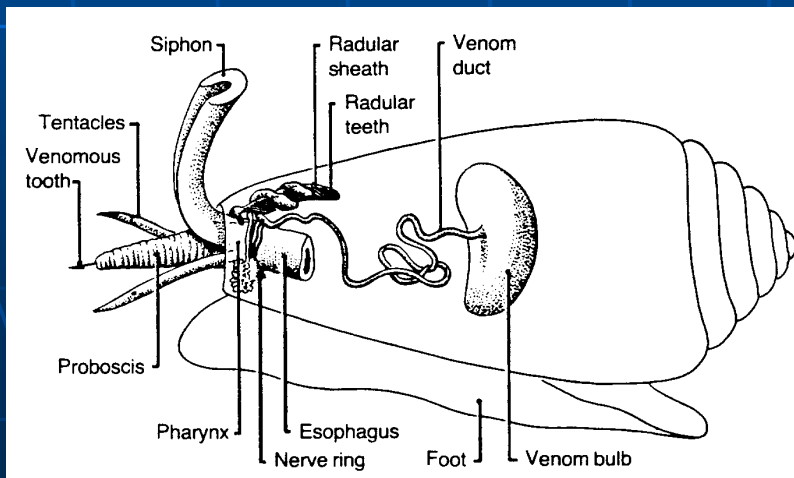


Figure 33. Venom apparatus of the Cone Shell.



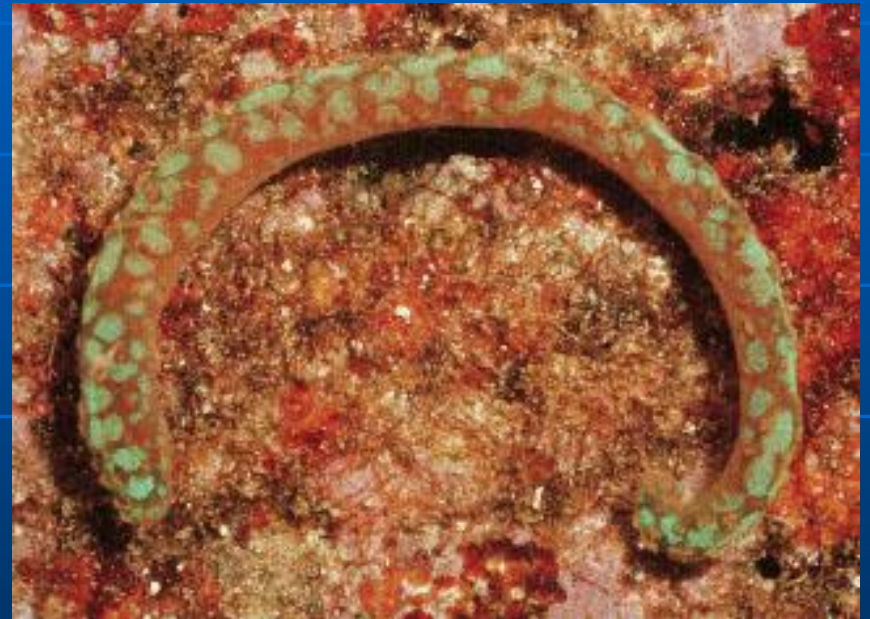
# Classification

- Class  
Polyplacophora
  - a.k.a. chitons
  - Shell consists of 8 plates





- Class Aplacophora
  - a.k.a. solenogasters
  - Small, worm-like
  - More common in deep water (i.e., 600-1,200 feet), but may be found in shallow interstitial communities



- Class  
Monoplacophora

- Segmented limpets
- Mostly occur in deep water (6,000-21,000 feet)
- Thought to be extinct since Silurian (400 Mya) until 1957
- *Neopilina* = living fossil, discovered until 1957





## ■ Class Bivalvia

- a.k.a. clams, oysters, and mussels
- Shell consists of two articulated valves held together by a chitinous ligament
- Lack radula and head, and sometimes lack the muscular foot
- Mostly suspension feeders, but also deposit feeders and predators



## ■ Class Cephalopoda

- Includes squids, cuttlefishes, octopuses, and nautiluses
- Most advanced molluscan nervous system
- All are active predators
- Shell reduced or absent
- Foot modified into tentacles
- Only about 800 extant species, compared to about 7,500 fossil species



## ■ Class Scaphopoda

- a.k.a. tusk shells, although name literally means “shovel foot” (which actually refers to the head)
- Shell is open on both ends
- Scaphopods are burrowers in mud and sediments
- Lack eyes



## ■ Class Gastropoda

- Includes snails and slugs
- Most speciose group of molluscs (~70% of species in Mollusca)
- Asymmetrical, univalved, usually spiral shell
- Characterized by torsion

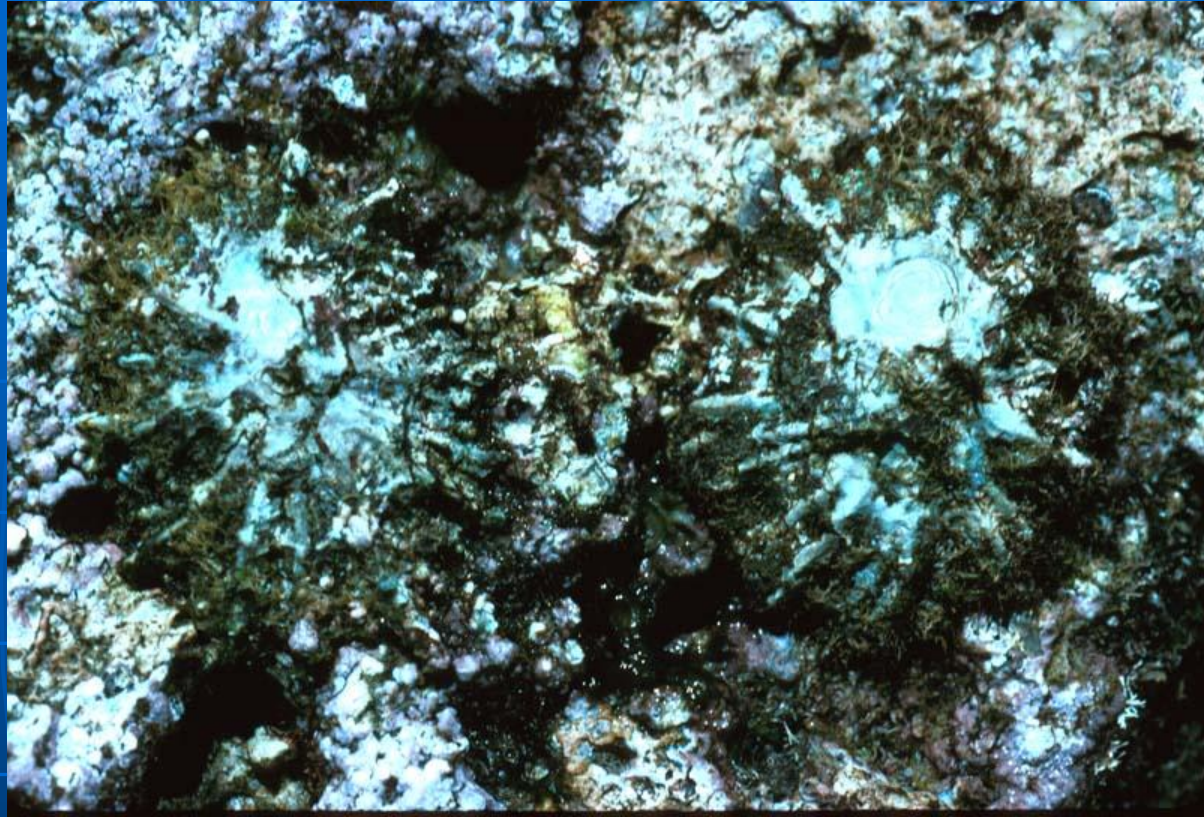




# Taxonomy



*Haliotis sp.*



*Patella flexuosa*



*Patelloida chamorrorum*





*Trochus niloticus*





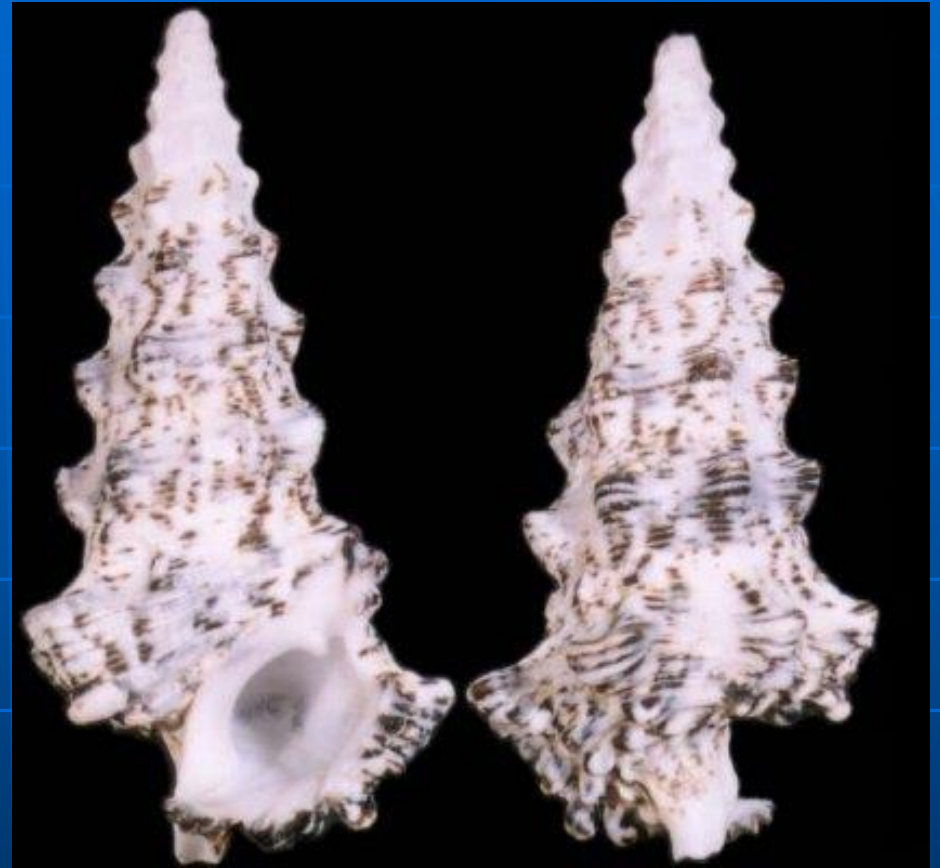
*Turbo petholatus*



*Modulus tectum*



*Planaxis sulcatus*



*Cerithium nodulosum*





*Dendropoma maxima*



*Strombus dentatus*



*Lambis lambis*



*Cypraea tigris*





*Cypraea talpa*

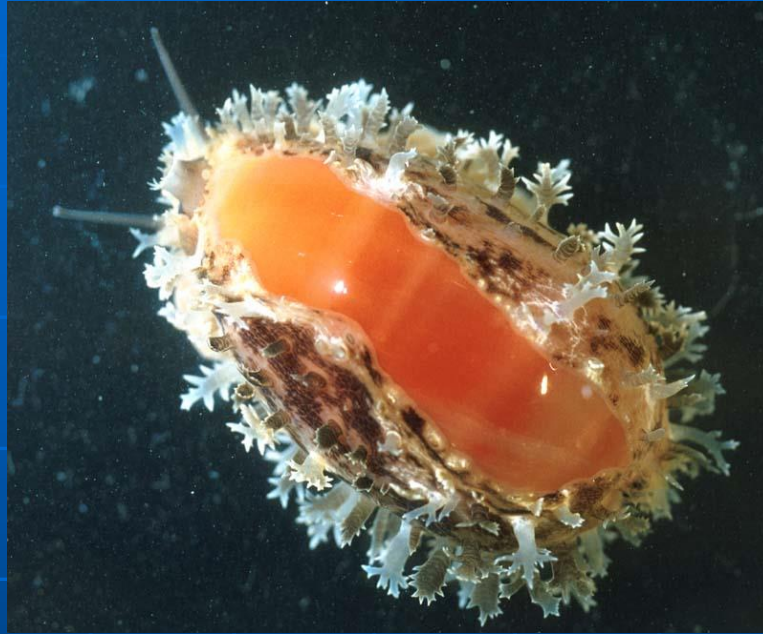


*Cypraea vitellus*



*Cypraea lynx*





*Cypraea carneola*



*Cypraea aurantium*



*Natica gualtieriana*



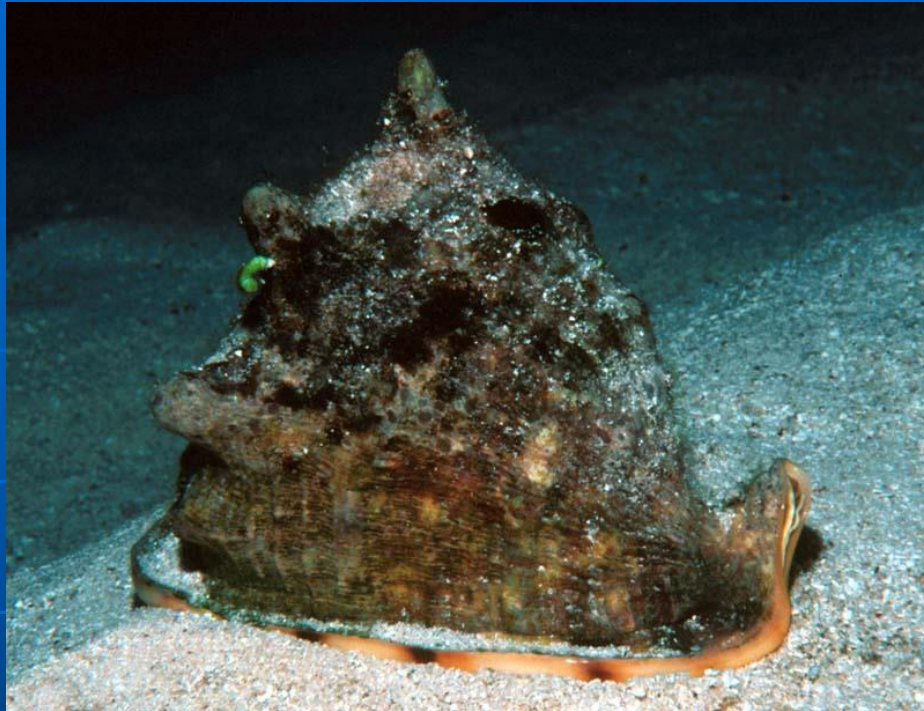
*Tonna perdix*





*Casmaria ponderosa*





*Cassis cornuta*

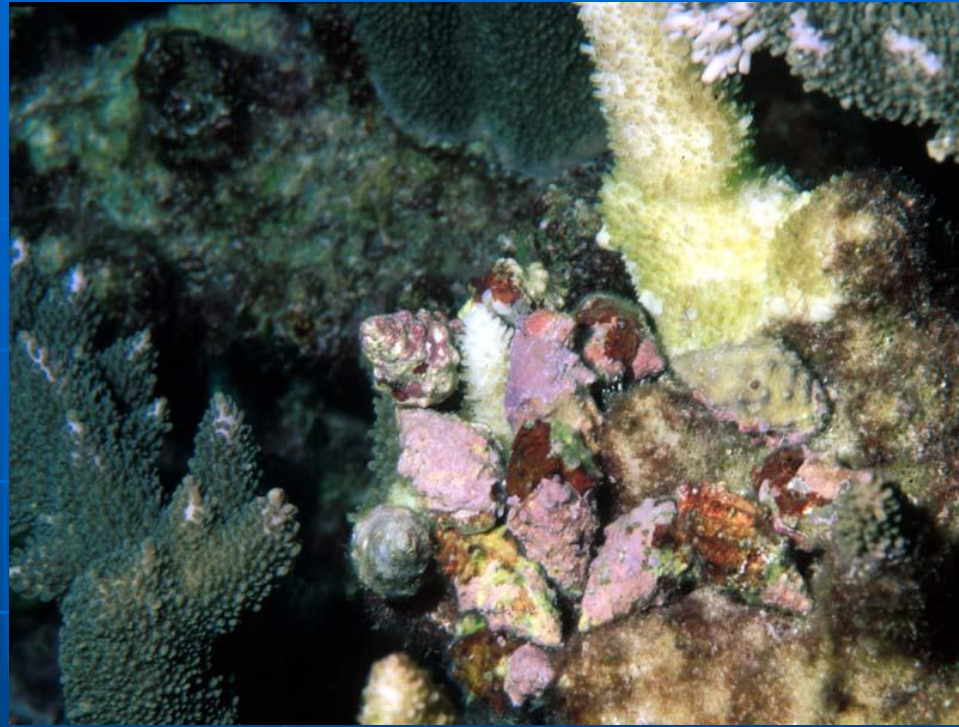


*Charonia tritonis*



*Chicoreus brunneus*





*Drupella rugosa*





*Vasum turbinellus*



*Harpa amouretta*



*Nassarius papillosus*



Costellariidae





*Conus geographus*



*Conus striatus*



*Conus tulipa*



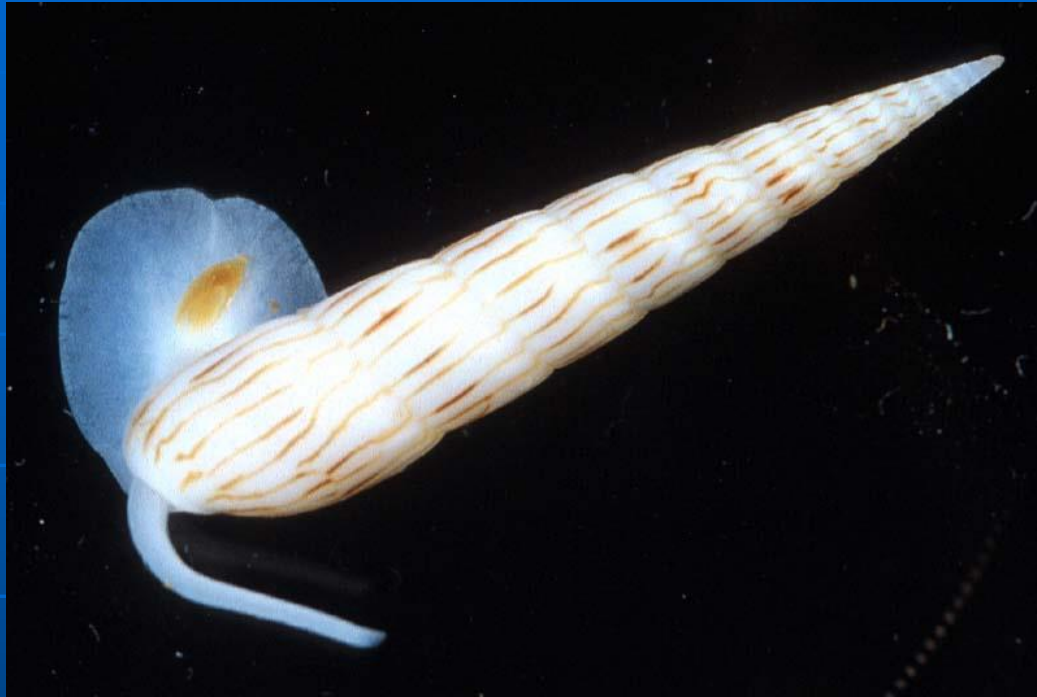


*Conus textile*





*Terebra maculata*



*Hastula lanceolata*



*Chromodoris* n. sp.



*Halgerda tessellata*





*Haminoea cymbalum*



*Anadara* sp.



*Hyotissa hyotis*





*Lopha cristagalli*





*Pinctada margaritifera*



*Pinna muricata*



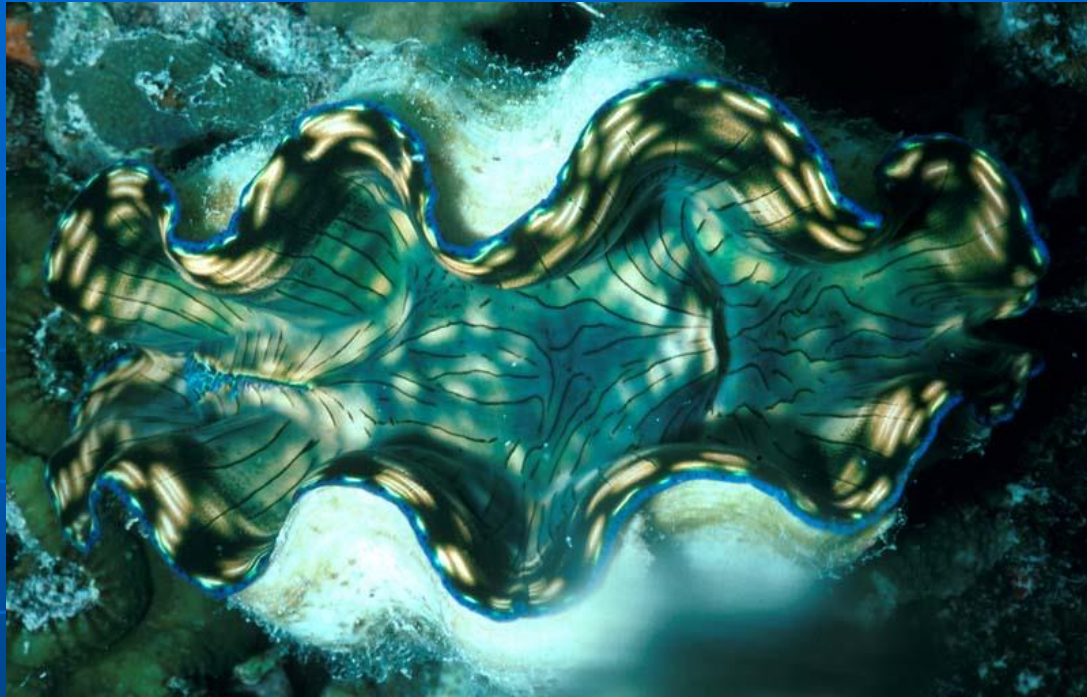
*Spondylus violacens*



*Tridacna gigas*







*Tridacna derasa*

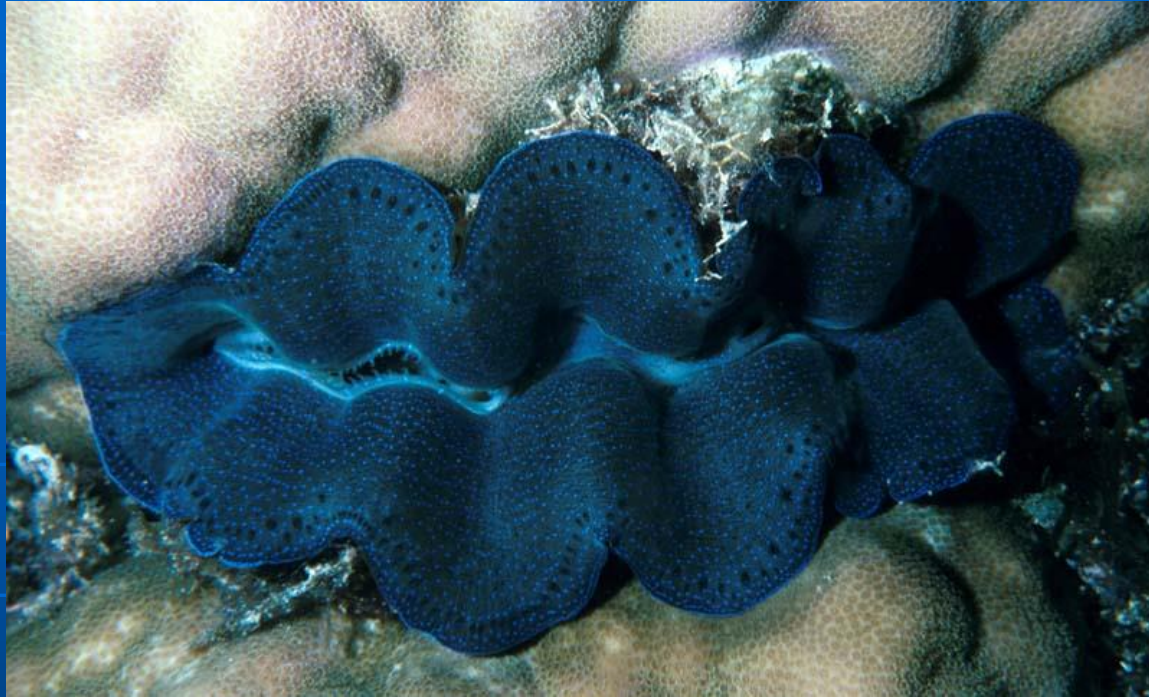


*Tridacna maxima*



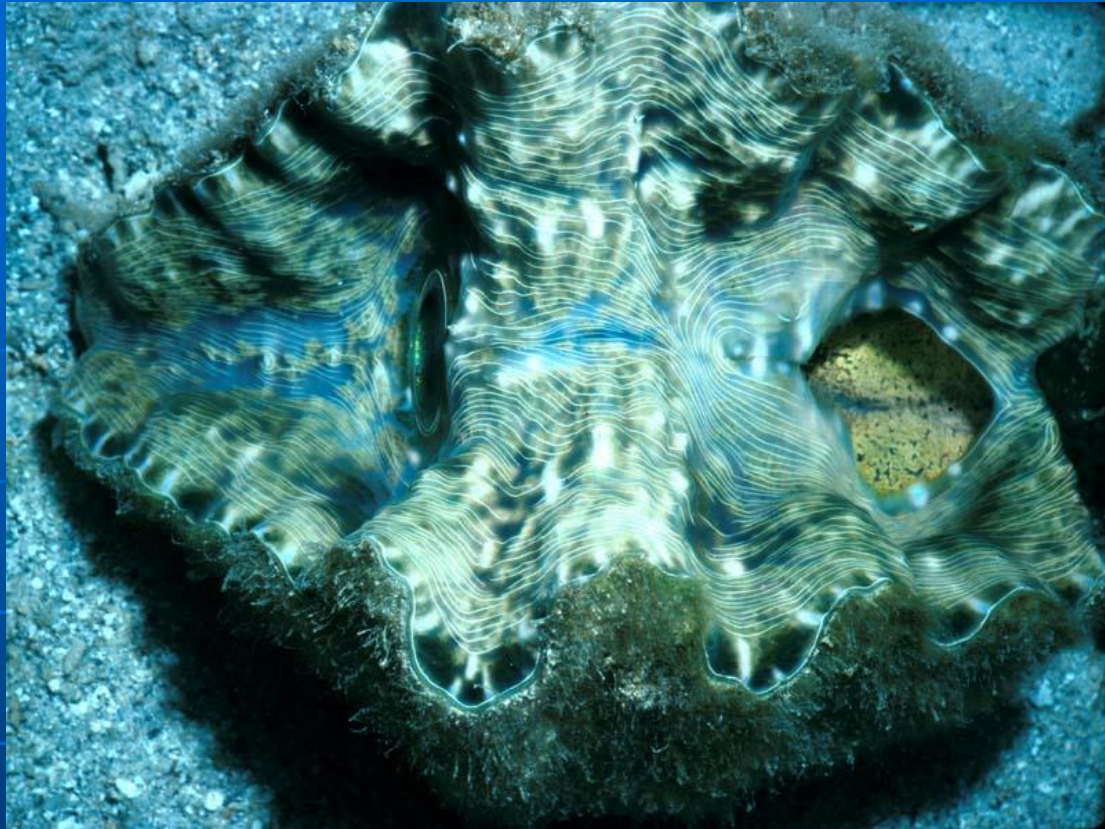


*Tridacna squamosa*



*Tridacna crocea*





*Hippopus hippopus*



*Hippopus hippopus* (bleached)



*Periglypta sowerbyi*





*Octopus cyaneus*





*Octopus ornatus*



*Sepia latimanus*



*Sepioteuthis lessoniana*