Phylum: Mollusca

B.Sc I (Hons + Subsi)

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Phylum: Mollusca

- Molluscs live in a wide variety of habitats from tropical regions, to polar regions, at altitudes of 7000 meters.
- Basically every water habitat from the high mountain lakes to the bottom of the ocean.
- The ecological niches found in molluscs include bottom feeders, herbivorous grazers, predaceous carnivores, and filter feeders.
- A variety of molluscs are used as food by humans and cultivated for their pearls.
- Some can be very destructive and destroy wooden ships (like shipworms).

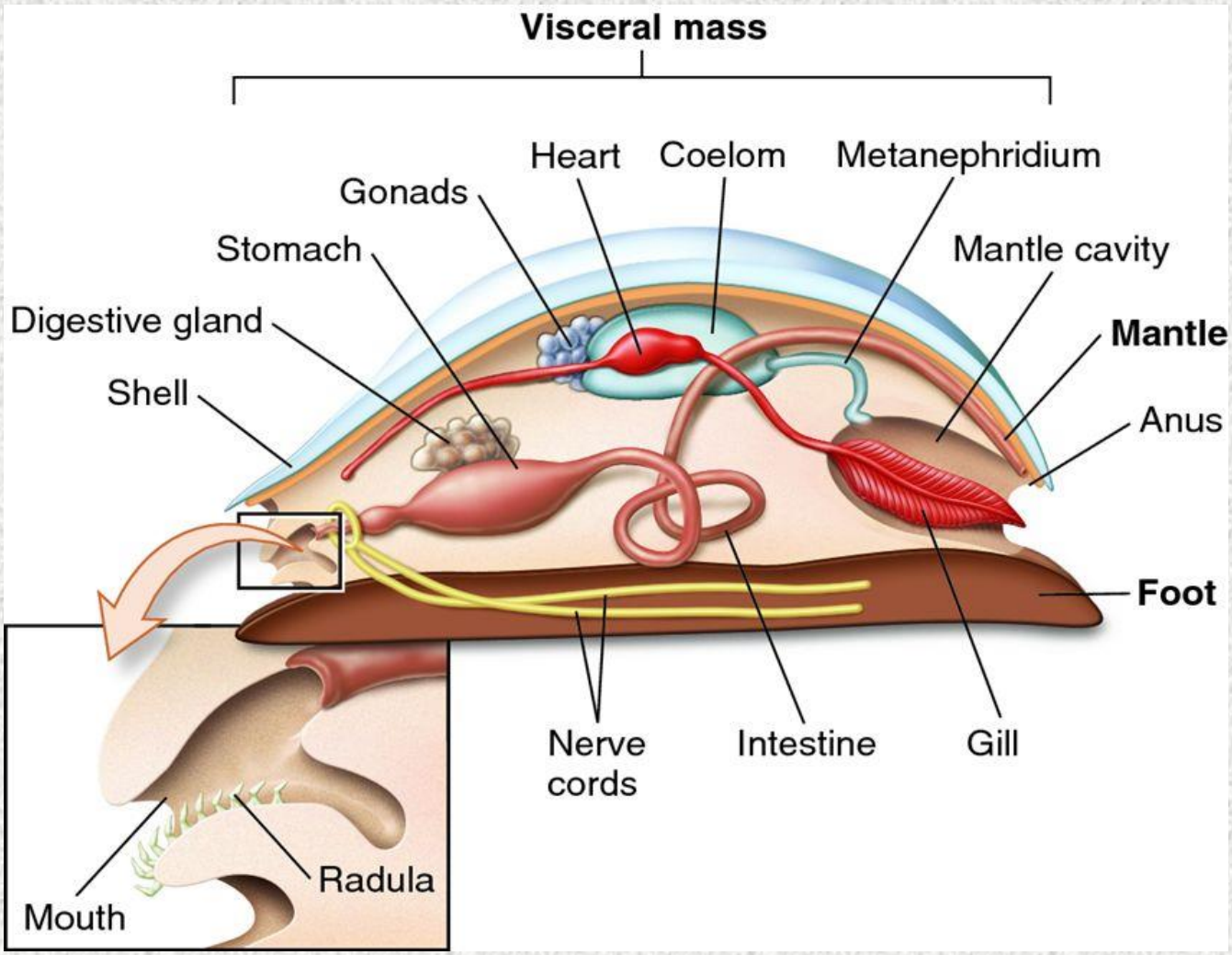
Characteristics of Phylum Mollusca

- Bilaterally Symmetrical, Protostome development, and Coelomate body cavity.
- Molluscs have a **muscular foot** that is the primary organ used for locomotion.
- Dorsal body wall forms a **mantle**, which is a sheath of skin that houses the internal organs and secretes a **shell**. (the shell is absent in some molluscs)
- Most molluscs have a rasping tongue called a **radula**.
- Most molluscs have an **open circulatory system** that drains into sinuses, except the cephalopods (octopus, squid, etc.) which have a closed circulatory system.

Characteristics of Phylum Mollusca

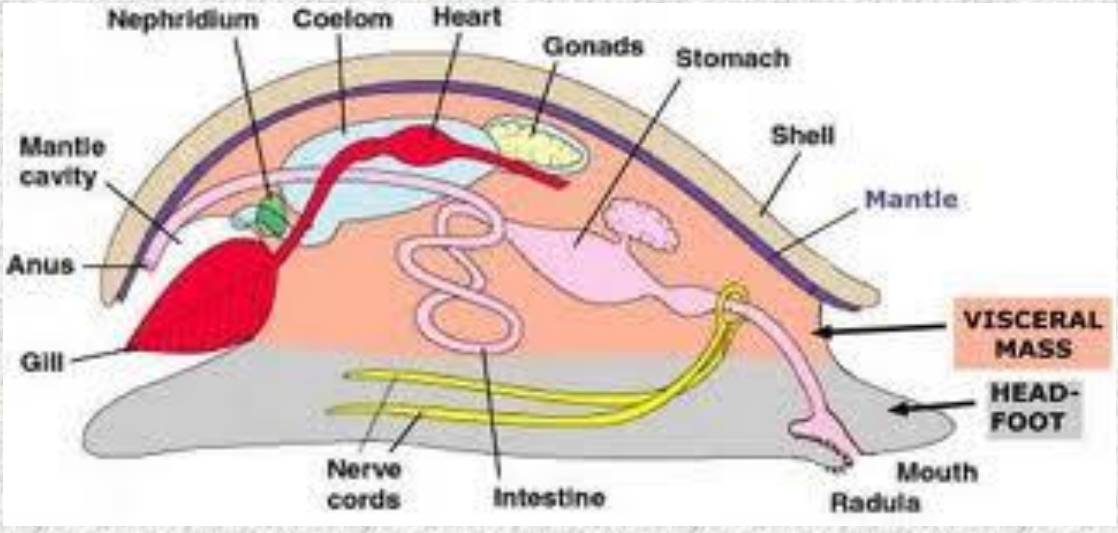
- Respiration occurs by gills, lungs, through the mantle cavity or through the skin (mantle).
- Usually one or two kidneys **(metanephridia)** empty into the mantle cavity.
- Nervous system of paired cerebral ganglia.
- Organ systems are well developed.
- Many molluscs have two larval stages called a **trochophore** and a **veliger**.

General Anatomy of Mollusca



Anatomy……

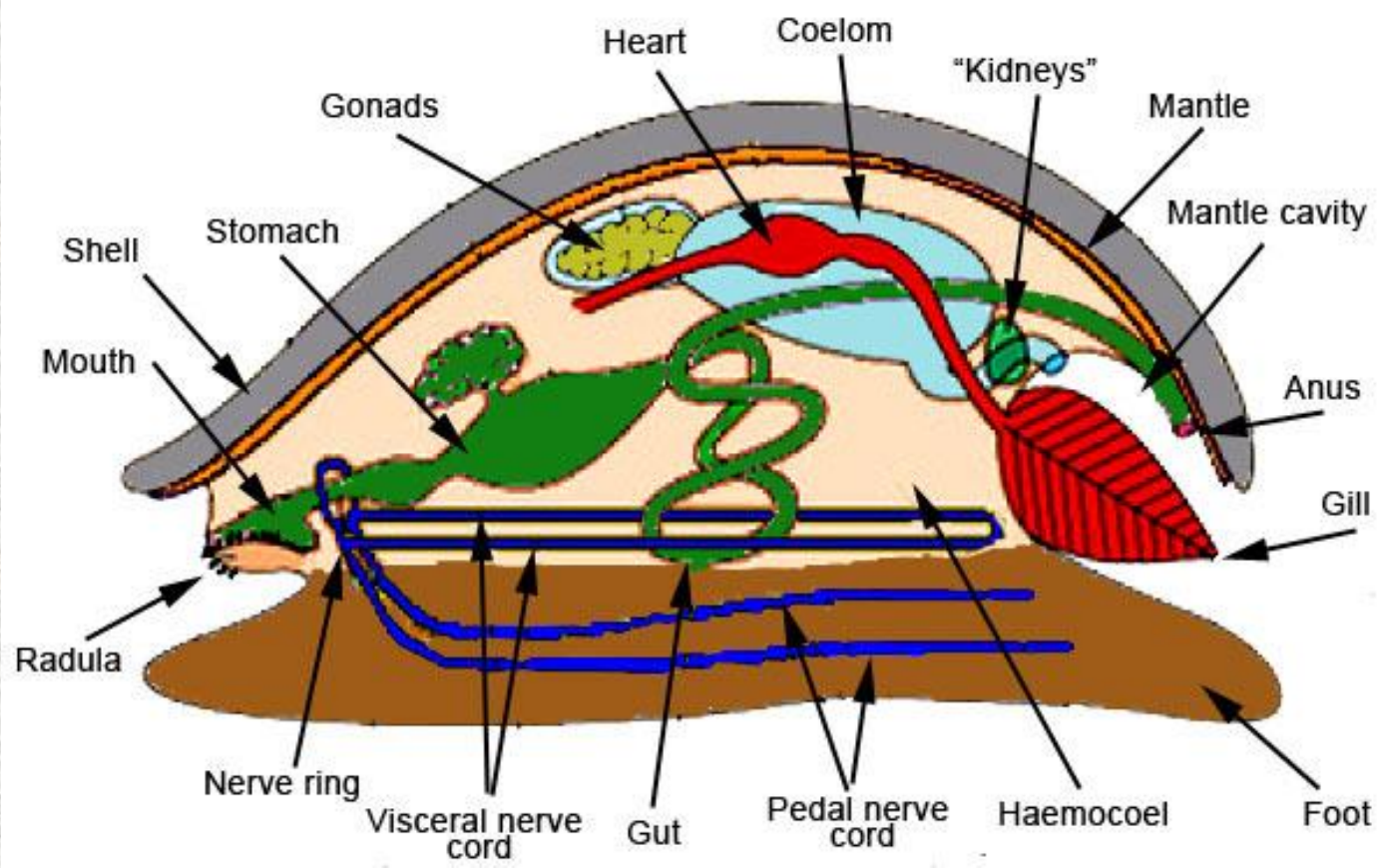
- The body of a mollusc consists of a **head-foot** portion, and a **visceral mass** portion.
- The **head-foot** portion of the body consists of a head with a mouth and radula, eyes, tentacles, and the **muscular foot** (primary organ used for locomotion).
- The **visceral mass** portion of the body consists of digestive, circulatory, respiratory, and reproductive organs.



Anatomy…..

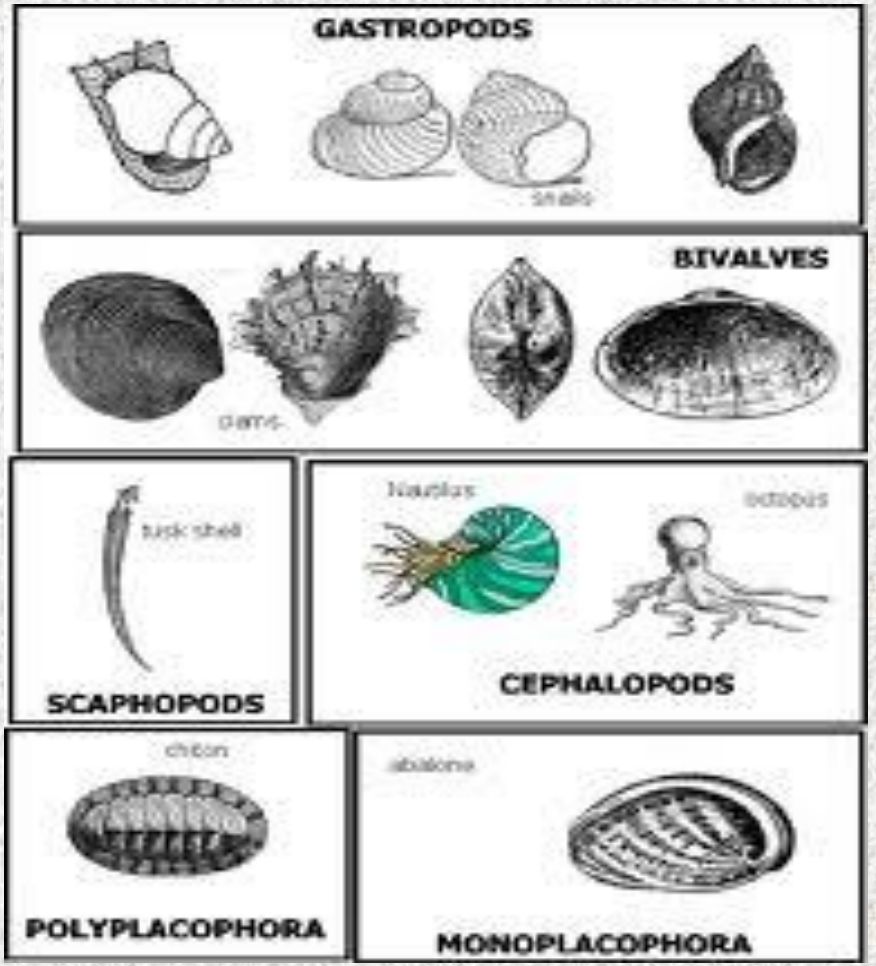
- The visceral mass is contained in the **Mantle.**
- The outer surface of the mantle secretes a **shell** made of calcium carbonate and protein.
- The **Mantle Cavity** houses respiratory organs like gills or lungs, and it also serves as a respiratory organ itself by exchanging gases. Most molluscs have an **open circulatory system** with a heart, blood vessels, and blood sinuses (cephalopods have a closed circulatory system with a heart, vessels, and capillaries).
- Many aquatic molluscs pass through a free-swimming larva stage called a **trochophore.**
- In some molluscs, like marine snails, tusk shells, and bivalves, the trochophore develops further into another larva stage called a **veliger.**

Mantle Cavity



Taxonomy of Mollusca

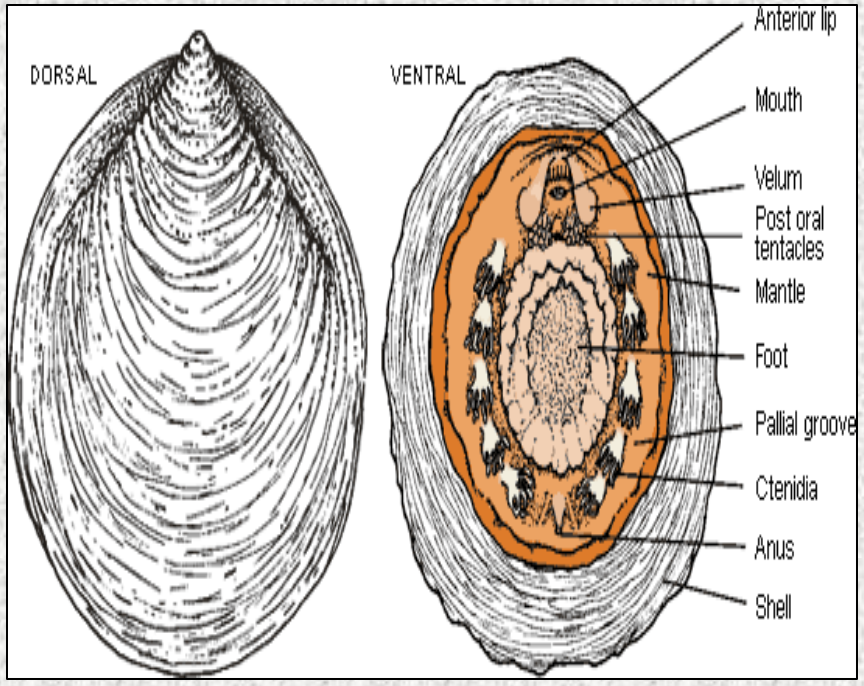
- Monoplacophora-single shelled molluscs
- Polyplacophora-chitons
- Scaphopods-tusk shells
- Gastropods-snails, slugs
- Bivalves-clams, oysters
- Cephalopods-octopus, squid, nautilus, cuttlefish



Class: Monoplacophora

- Monos means one; plax means plate; pherein means bearing.
- Shell consists of single piece or **valve**.
- They are marine.
- Body is segmented and bilaterally symmetrical.
- Head is **without eyes** and **tentacles**.
- Foot is **flat** and **ventral**.
- Mantle is present which encircles the body as a circular fold of the body wall.
- e.g. *Neoplina* (connecting link between Annelida and Mollusca).

Monoplacophora



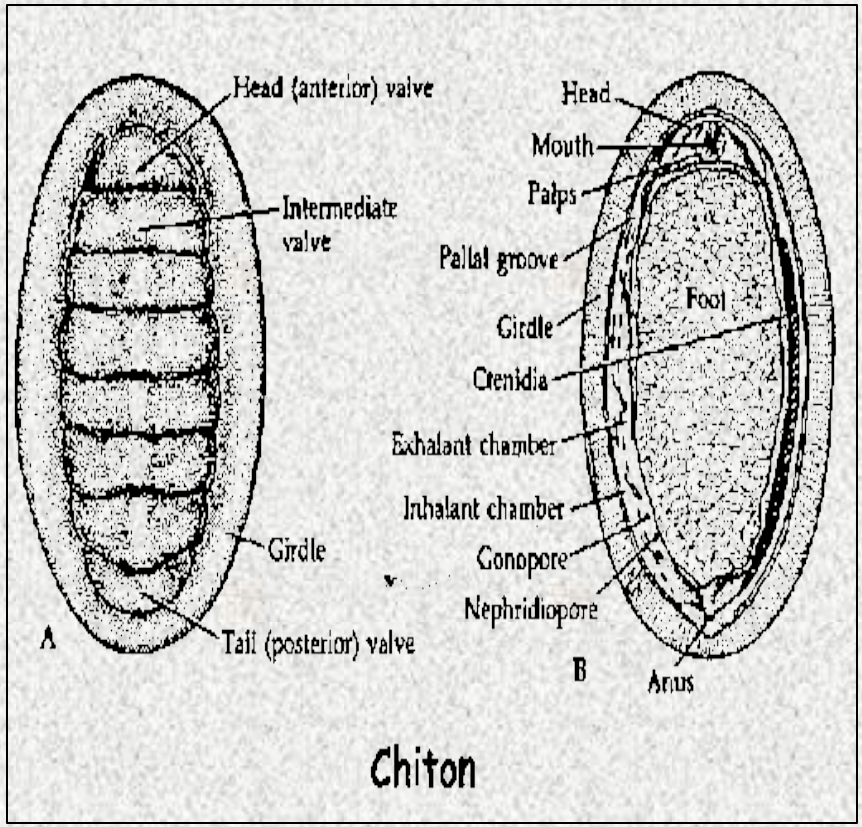
Neopilina

Class: Polyplacophora

- They are mostly marine.
- Shell consists of **8 plates**.
- Body is **elliptical, convex dorsally** and **flattened ventrally**.
- Head is distinct but without eyes and tentacles.
- Foot is flat and ventral.
- Development is indirect with **trochophore larva**.
- Mantle is present.
- e.g. *Chiton*

Polyplacophora

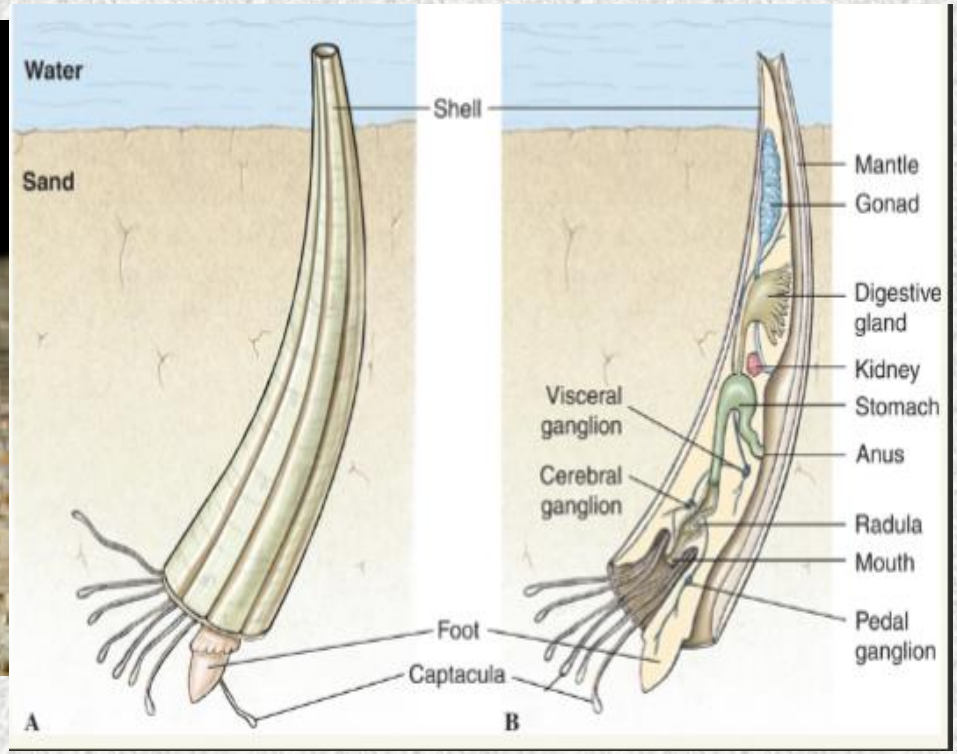
Chiton



Class: Scaphopoda

- They are marine.
- Body is elongated and enclosed in a **tusk like shell**.
- Shell is **cylindrical** and the head bears a mouth.
- Foot is **conical** for **digging**.
- Development is indirect with a **trochophore**
- Mantle is single **lobed** and **tubular**.
- e.g. *Dentalium*

Scaphopoda

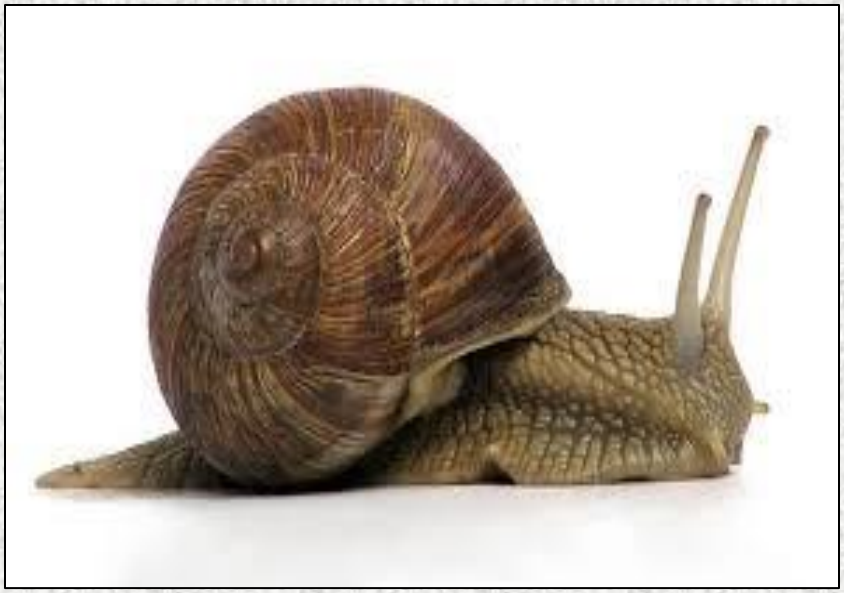


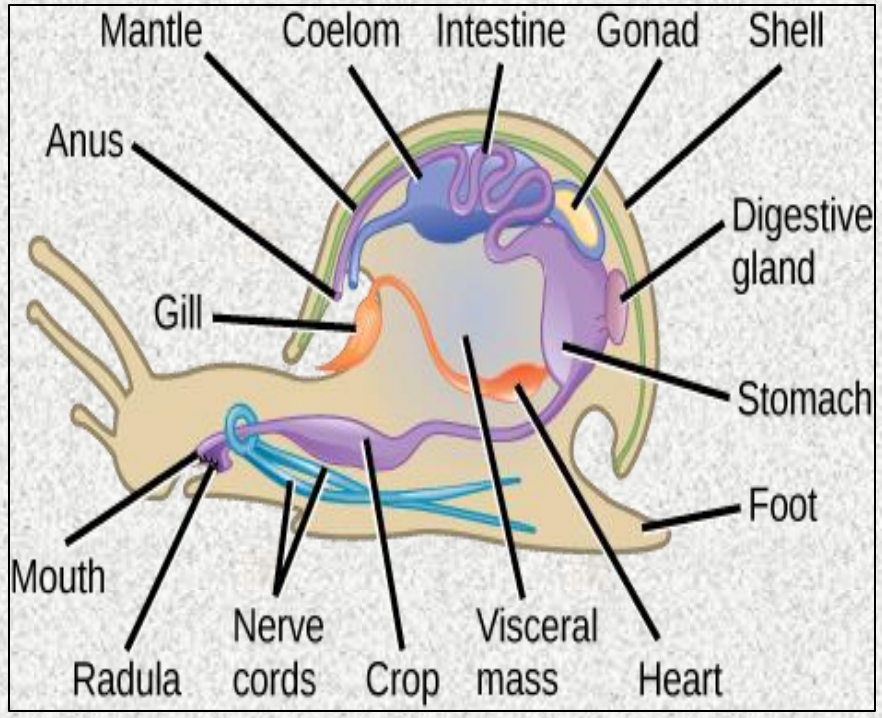
Dentalium

Class: Gastropoda

- They are either aquatic or terrestrial.
- Body is unsegmented and **asymmetrical**.
- Head is distinct with tentacles, eyes and mouth.
- Foot is **sole like**, broad, flat and muscular.
- Shell is **univalve**, hence also called **Univalvia**.
- Development is indirect with **dorsally** located or **velliger**
- Mantle helps in respiration.
- e.g. *Helix* (Snail), *Limax* (Slug), *Pila* (Apple snail)

Gastropoda



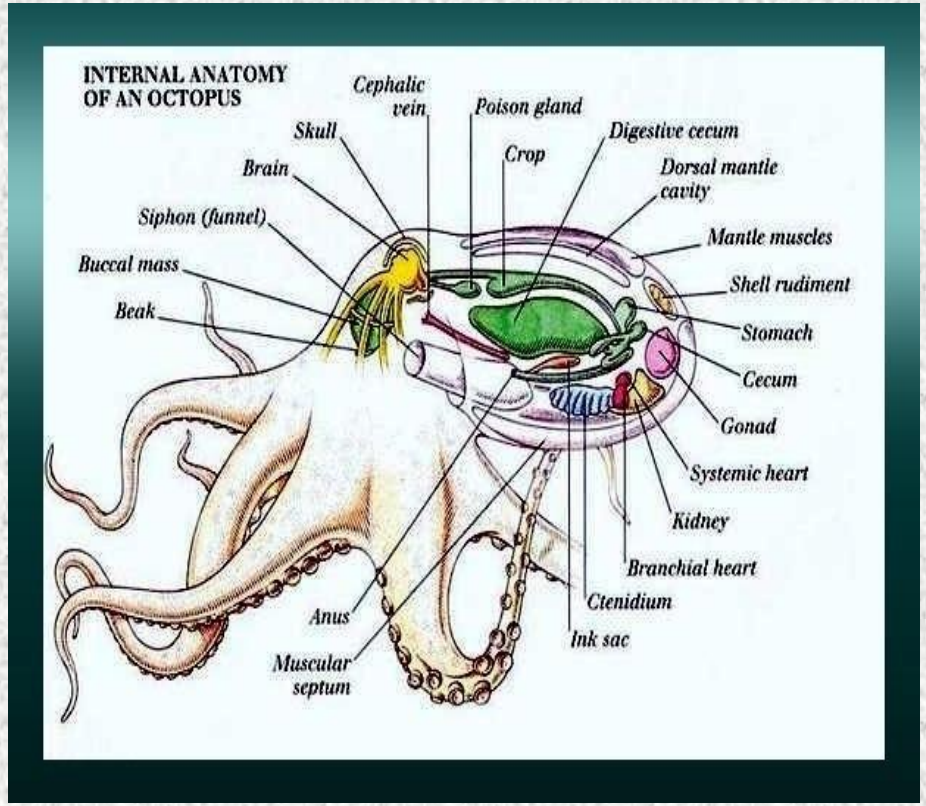


Helix

Class: Cephalopoda

- They are mostly marine.
- Body is bilaterally symmetrical with head and trunk.
- Head bears large eyes (resembles with that of vertebrates) and mouth.
- Foot is situated on the **head**.
- Foot is modified into **arms** and **siphon.**
- Shell is **absent** or **internal.**
- Circulatory system is **closed type**.
- Mantle may be present or absent.
- Development is direct.
- e.g. *Sepia, Octopus, Loligo*

Cephalopoda

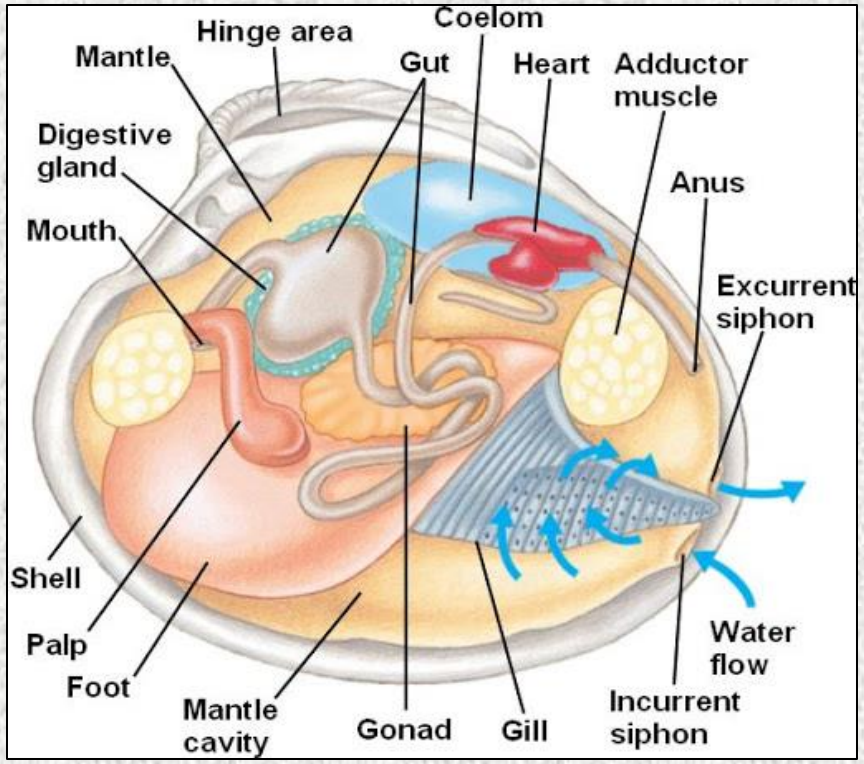


Octopus

Class: Bivalves

- Body is **laterally compressed**.
- Shell is bi-valve and hence also called **Bivalvia**.
- Head is not distinct.
- The foot is **tongue**
- Mantle is paired and consists of right and left lobes.
- Development is indirect with **glochidium**
- They are commonly called **pearl forming groups** that is secreted by the shell gland of mantle.
- e.g. *Unio,* Oyster

Bivalves



Unio