PHYLUM: HEMICHORDATA

- **CLASS: PTEROBRANCHIA**
  - Ten species in this class
  - Live in colonies
  - Larval bodies divided in to a proboscis, collar and trunk
  - The collar expands dorsally into tentacled arms which possess cilia that direct food into ciliated grooves which carry it to the mouth
  - The alimentary canal is U-shaped with the anus outside the fringe of tentacles
  - In most species there is only one pair of pharyngeal slits
  - Some are dioecious, most are hermaphroditic
  - Fertilization is external,
  - The sexually produced individuals then give rise to colonies by budding.

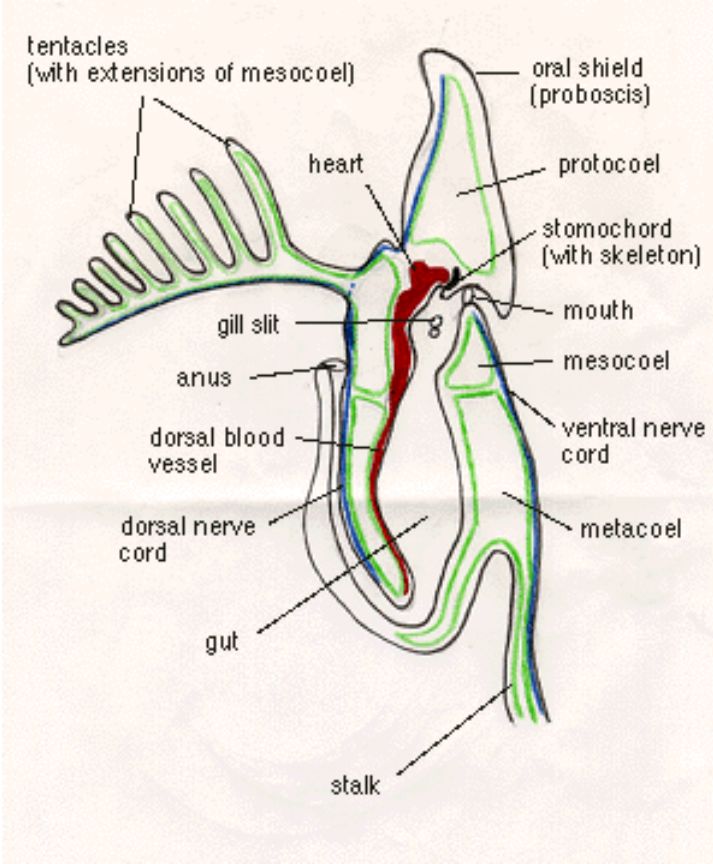
Class Pterobranchia

pteron- wing

branchia- gill

Deep marine water

Some live in shallow waters



Body divided into three regions

Size 0.1 - 5mm

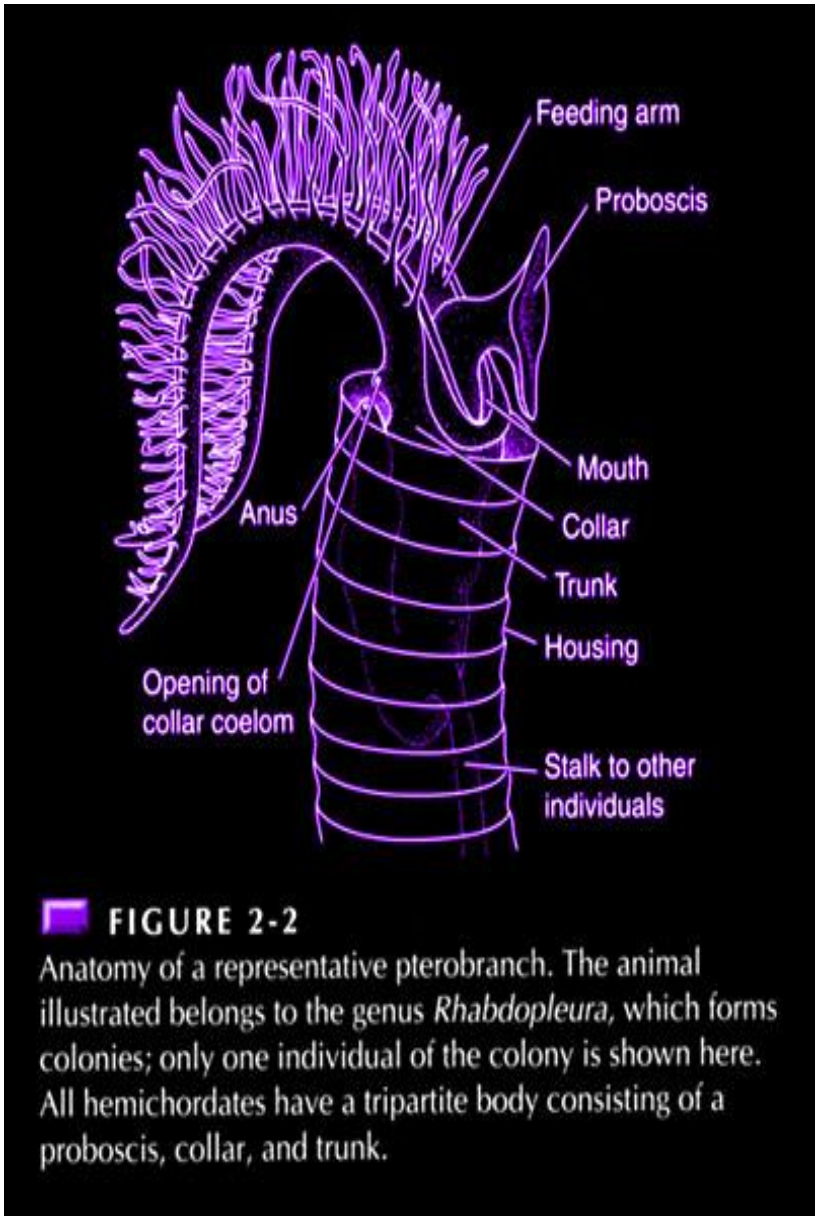
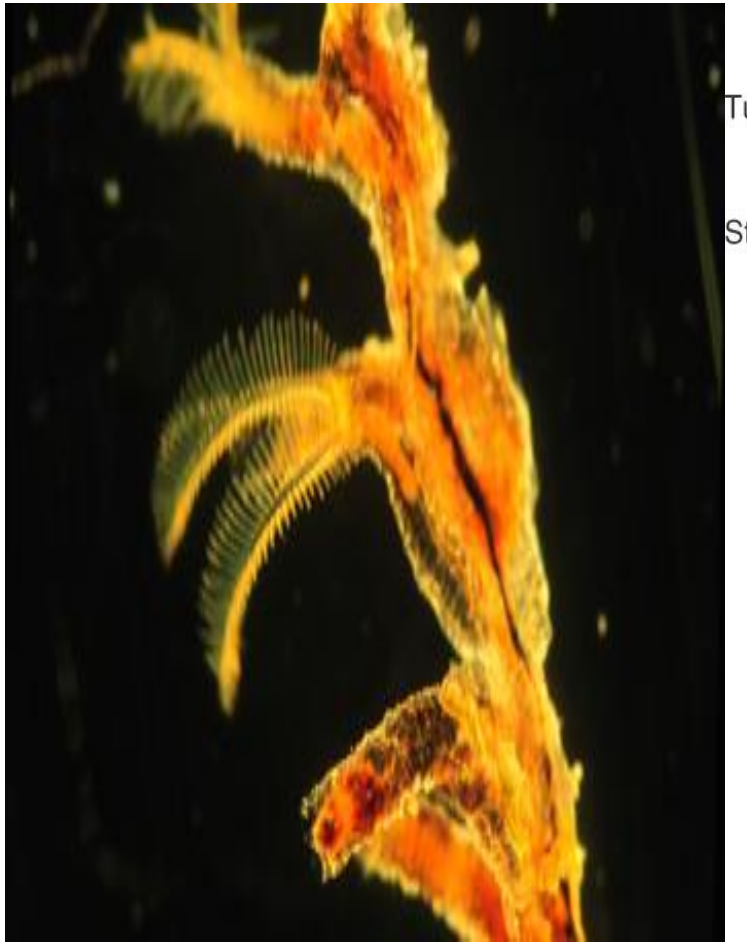


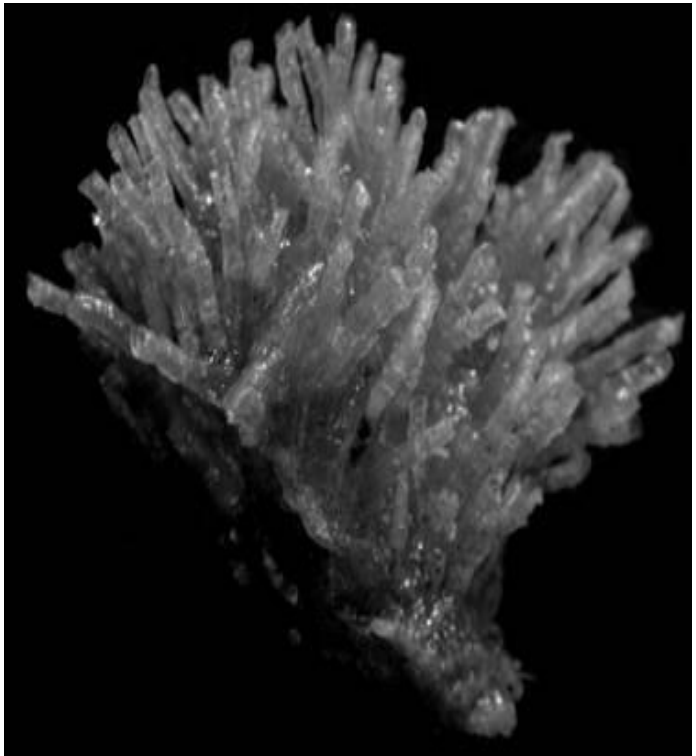
FIGURE 2-2
Anatomy of a representative pterobranch. The animal illustrated belongs to the genus *Rhabdopleura*, which forms colonies; only one individual of the colony is shown here. All hemichordates have a tripartite body consisting of a proboscis, collar, and trunk.

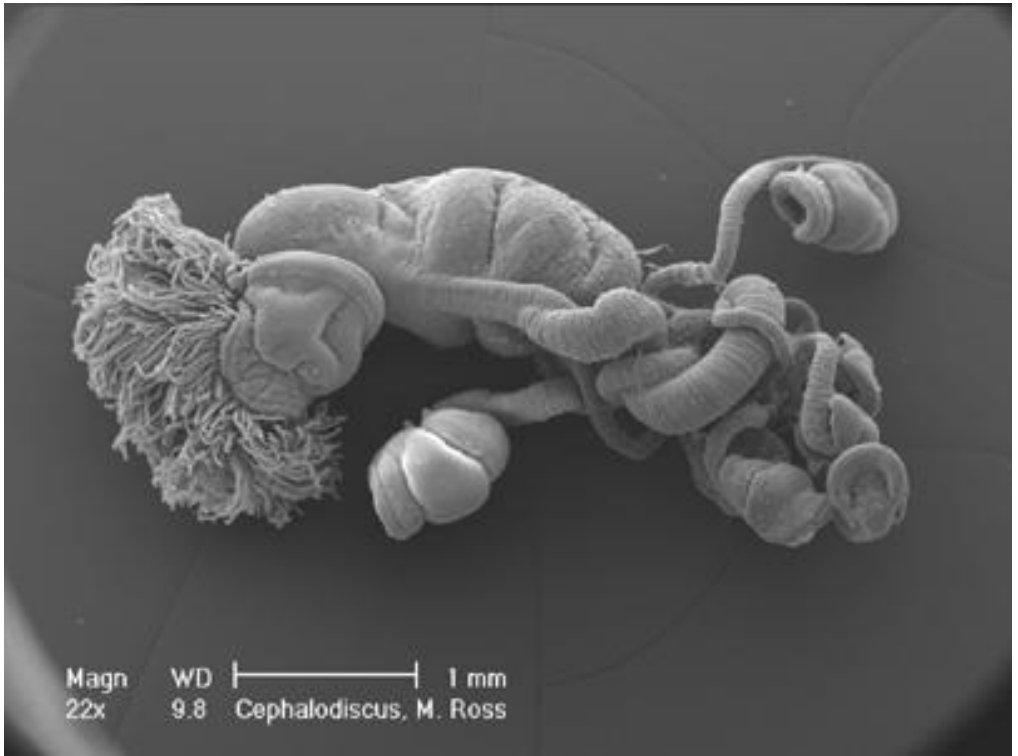


Collar
Tentacles
Proboscis
Arms
Mouth
Anus
Tube
Stalk
Zooid

Individuals called zooids

Most live in secreted tubes in asexually produced colonies



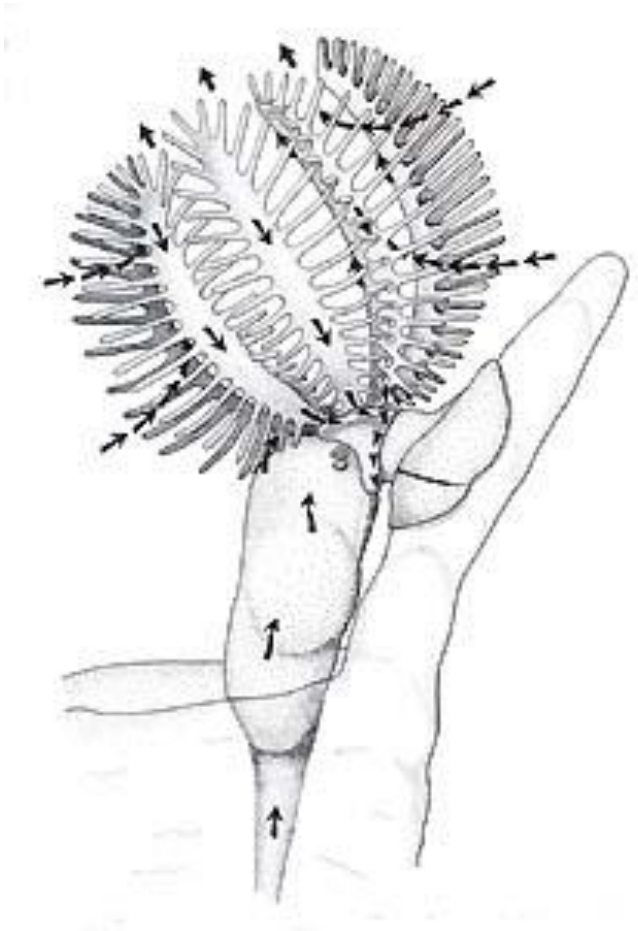


Maintenance Functions

Filter feeders

Cilia on tentacles trap and transport Food to mouth

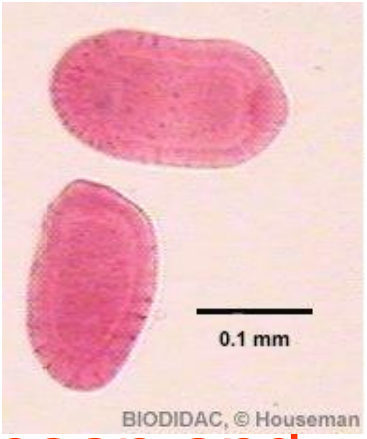
Respiration and excretory exchange by diffusion



Reproduction and Development

Asexual budding is common and responsible for colony formation

Also some posses one or two gonads



Most species are dioecious

External fertilization

Planula-like larva (cnidarian)

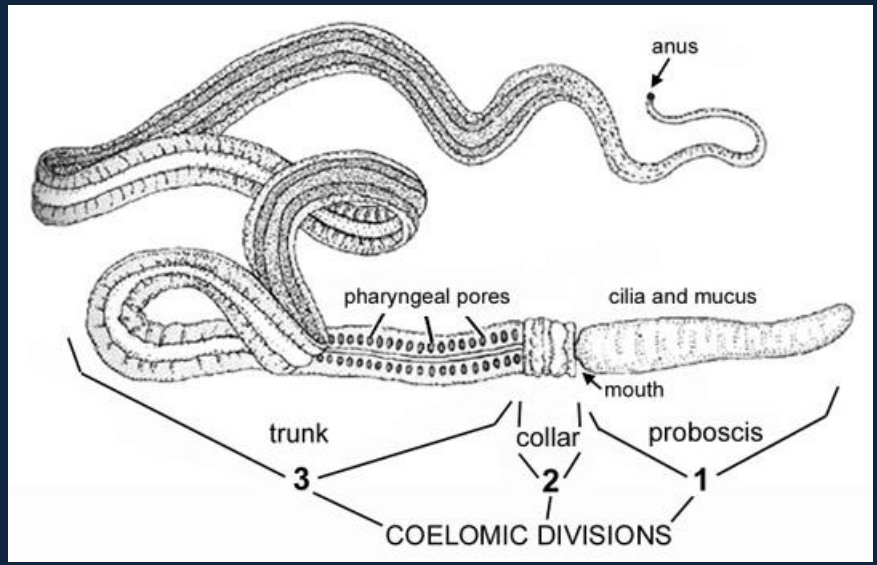
Settles to a substrate, forms cocoon and metamorphoses into an adult

PHYLUM: HEMICHORDATA

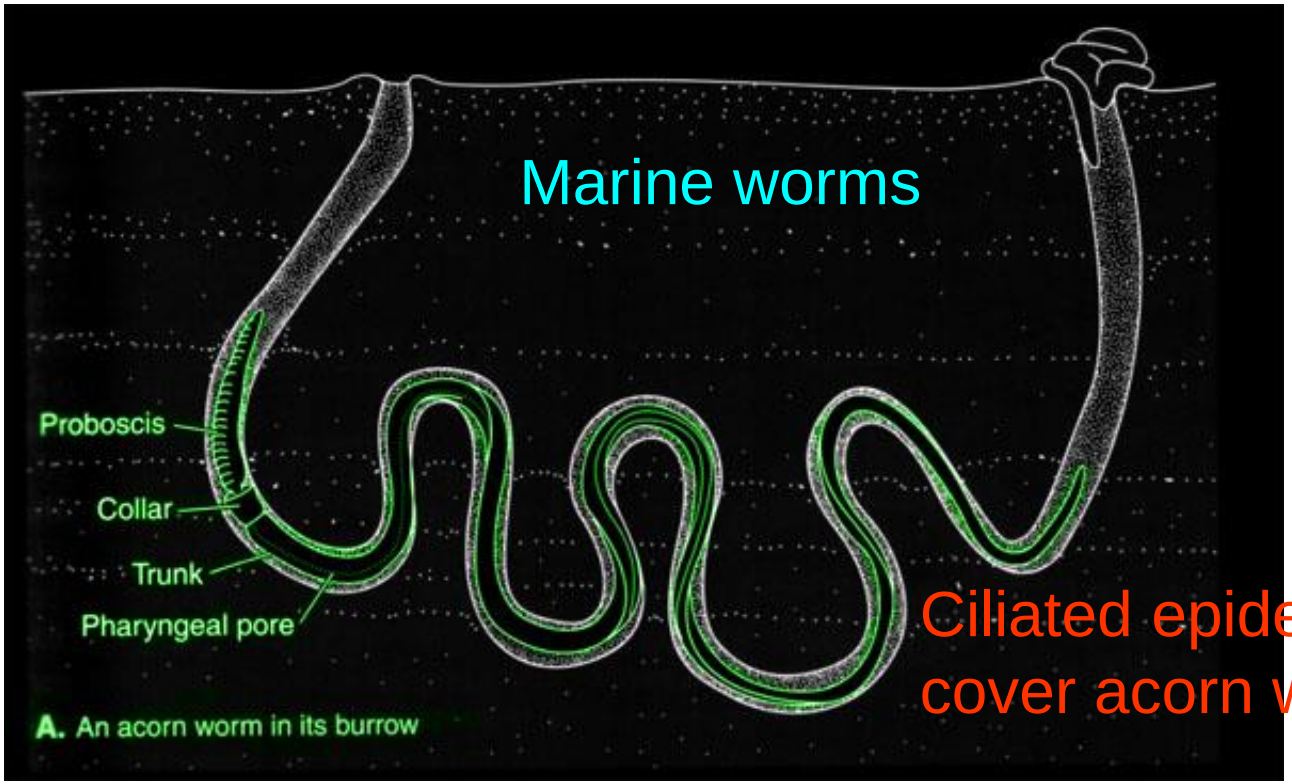
CLASS: ENTEROPNEUSTA

- Commonly referred to as acorn worms

- These animals burrow in marine sediments have worm-like bodies divided into a proboscis, collar, and trunk



Class Enteropneusta



Ciliated epidermis and glands cover acorn worms

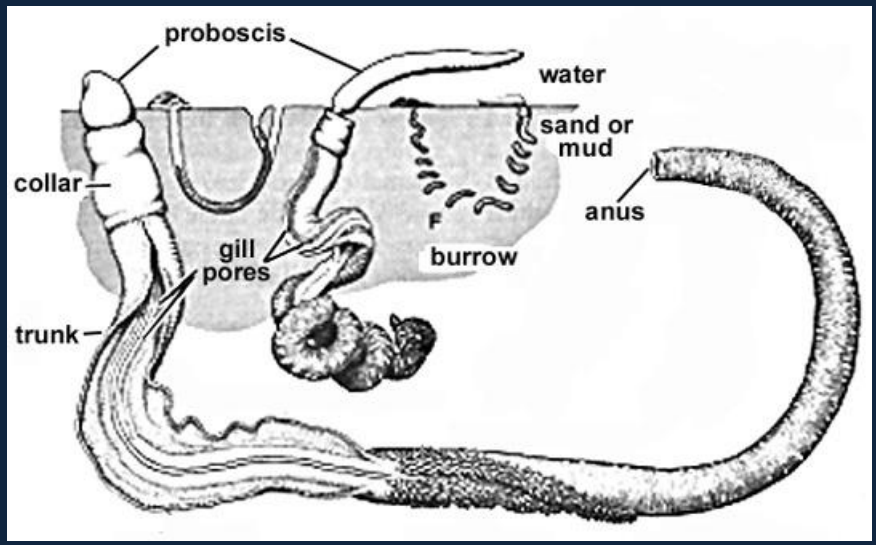
Burrow in sandy and muddy substrates

Common name ‘acorn worms’

PHYLUM: HEMICHORDATA

CLASS: ENTEROPNEUSTA

- **General Characteristics**
- Possess a prominent proboscis, a collar and a long slimy trunk
- Up to 2 metres in length
- Each of these three regions have a separate coelomic compartment filled with spongy tissue that provides some mechanical support
- Acorn worms either live in U-shaped burrows in shallow water or they burrow through marine sediment or live under rocks or seaweed



PHYLUM: HEMICHORDATA

- **CLASS: ENTEROPNEUSTA**
- **General Characteristics**
- The proboscis is the main organ of locomotion
- The trunk is pulled along passively
- Many acorn worms feed by ingesting large quantities of mud or sand from which the gut extracts organic debris
- Others feed by means of cilia on the proboscis which pass the food backwards into the mouth
- Food particles are bound on a mucous string and are swallowed along with the water

PHYLUM: HEMICHORDATA

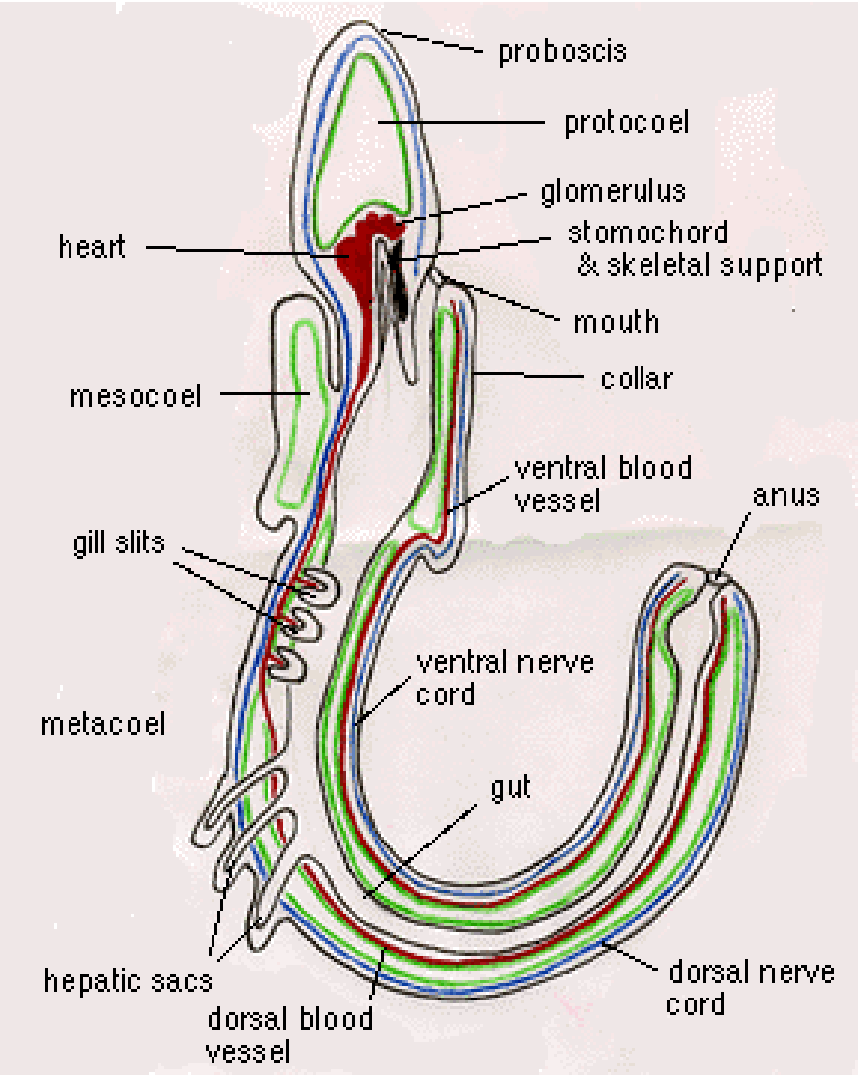
CLASS: ENTEROPNEUSTA

- **General Characteristics: Internal Structure**
- The pharyngeal slits are U-shaped openings in the pharynx that can swallow water in to the pharyngeal pouches and out through the gill pores.
- The body: surface is the main route for respiratory exchange.
- The colourless blood is pumped anteriorly by a dorsal vessel into a contracting heart vessel in the proboscis and then posteriorly by a ventral vessel – an open circulatory system.
- the glomerulus is assumed to have an excretory function
- The nervous system consists largely of a diffuse network in the base of the epidermis.
- Along the dorsal and ventral midlines this plexus is concentrated into dorsal and ventral nerve cords which lack ganglia.
- In places the nerve cord is hollow and similar to the hollow dorsal nerve of the chordates.
- Sexes are separate and fertilization is external

Maintenance Functions

Ventral Mouth

Lateral Pharyngeal slits,few to several hundred

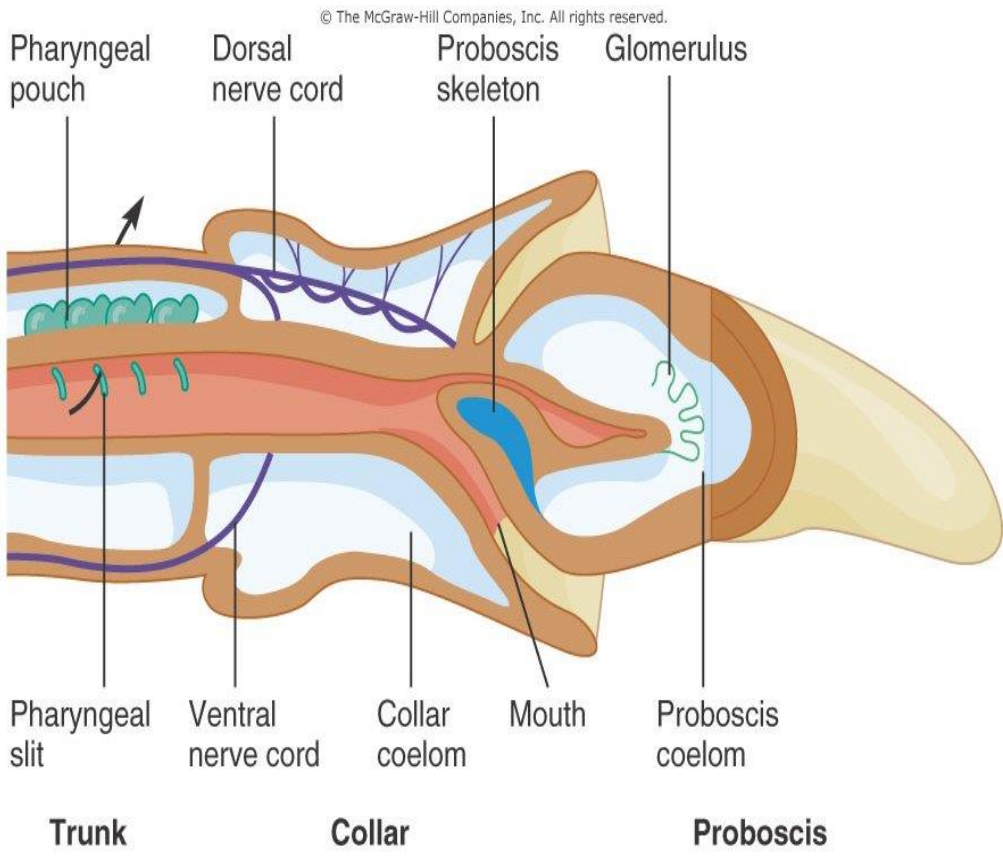


Cilia and mucus assist acorn worms in feeding

Ciliary tracts converge near the mouth and form a mucoid string that enters the mouth

Nervous system

- Ectodermal in origin
- Lies at the base of the ciliated epidermis
- Consist of dorsal and ventral nerve tracts
- No major ganglia
- Sensory receptors are unspecialized

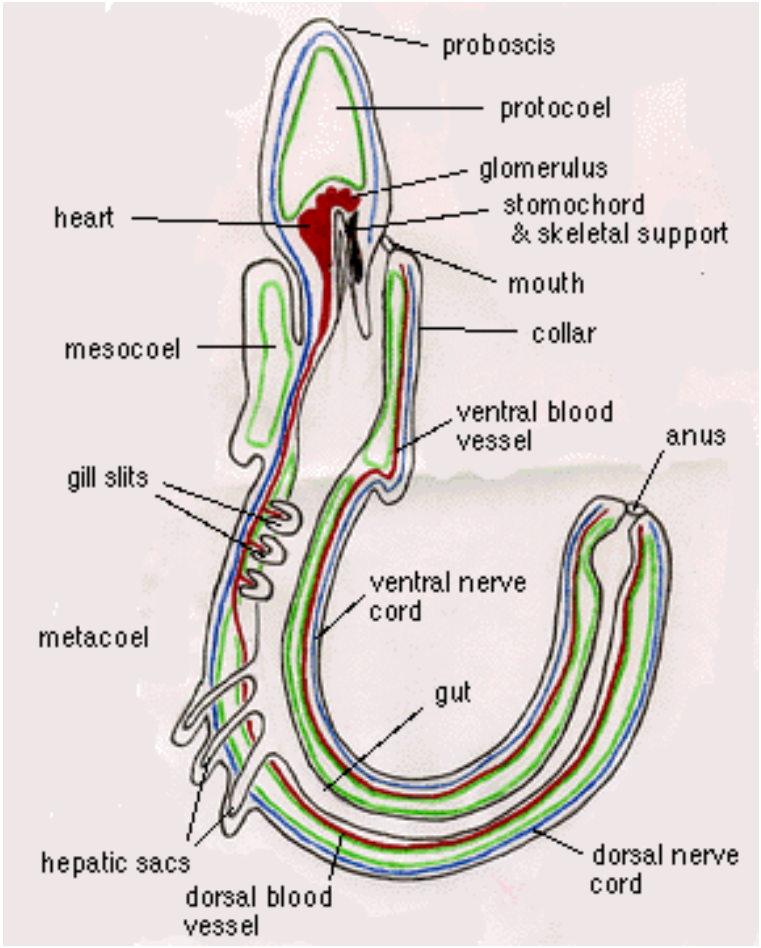


Respiration

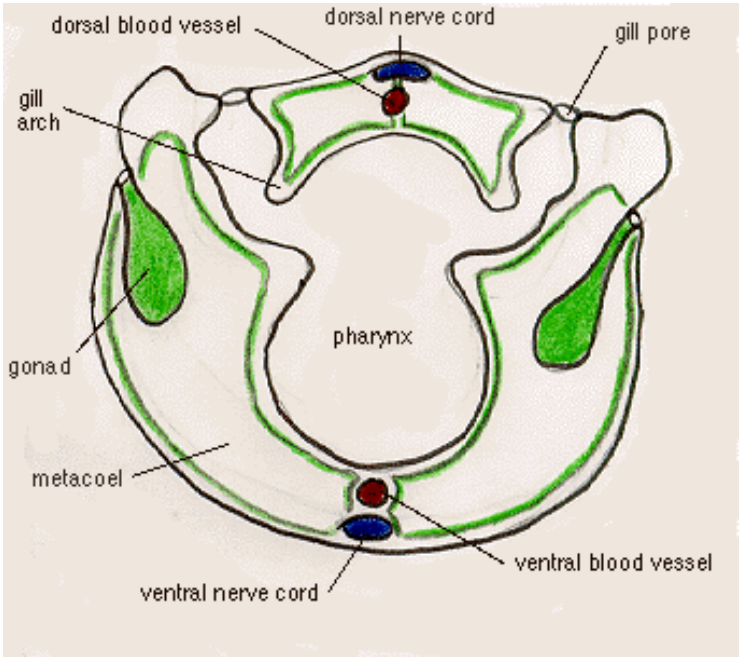
- Simple diffusion of metabolic waste
- Cilia associated with Pharyngeal slits circulate water into mouth and out of body
- Gas exchange as water passes through pharyngeal slits

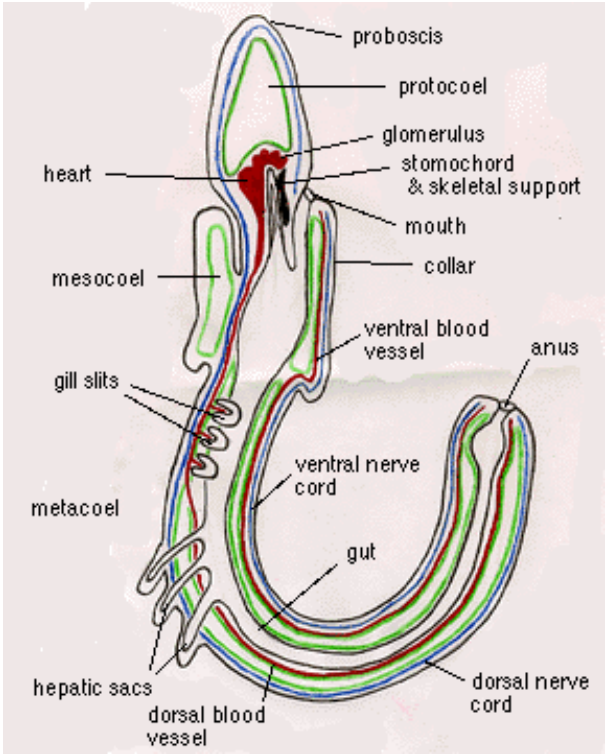
Circulatory system

- Colorless blood moves nutrients and wastes
- Dorsal and ventral contractile vessel
- Blood moves anteriorly in dorsal
- Posteriorly in ventral vessel
- Branches from theses vessels lead to open sinuses (Partially open circulatory system)
- Anterior flowing blood moves through glomerulus (excretory organ)
- Waste filtered into proboscis coelom and out through pores found in wall of proboscis



Reproduction and Development





Dioecious!!

External Fertilization

pheromones