Nematodes and Molluscs

Nematoda or the round worms (pp 107-114)

Nematodes are one of the most abundant animal groups on earth. They are common in soil and aquatic ecosystems. Many are parasitic. A few are major pests on agricultural plants. We will examine *Ascaris*, an intestinal parasite. BE CAREFUL TO WEAR GLOVES WHILE HANDLING *ASCARIS*. WASH THOUROUGHLY AFTER HANDLINNG. EGGS OF *ASCARIS* ARE VIABLE EVEN AFTER STAYING IN FORMALIN FOR A LONG WHILE.

Important characteristics of *Ascaris* and other nematodes:
- Pseudocoelomlate
- One way or "flow through" gut
- No circular muscles only longitudinal (characteristic movement)
- Cuticle
- Dioecious

Examples:

1. Look at the free living vinegar eels for how they move.

2. Dissection of preserved adults (*Ascaris*)- follow lab manual
   cross sections of *Ascaris*
   Differences (external and internal) between male and female, digestive tract,
   Cross section (Figs 1 & 2, compare to flat worm and annelid)

Male *Ascaris* in cross section

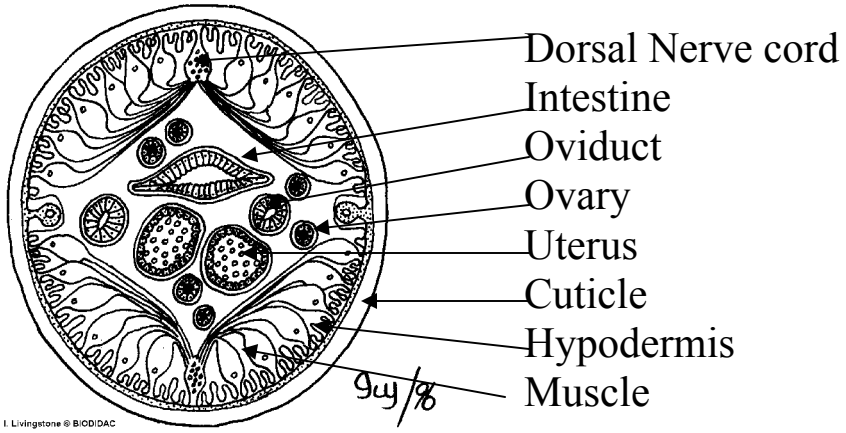

Figure 1 Female *Ascaris* in cross section (Figure 15-2 in your text)

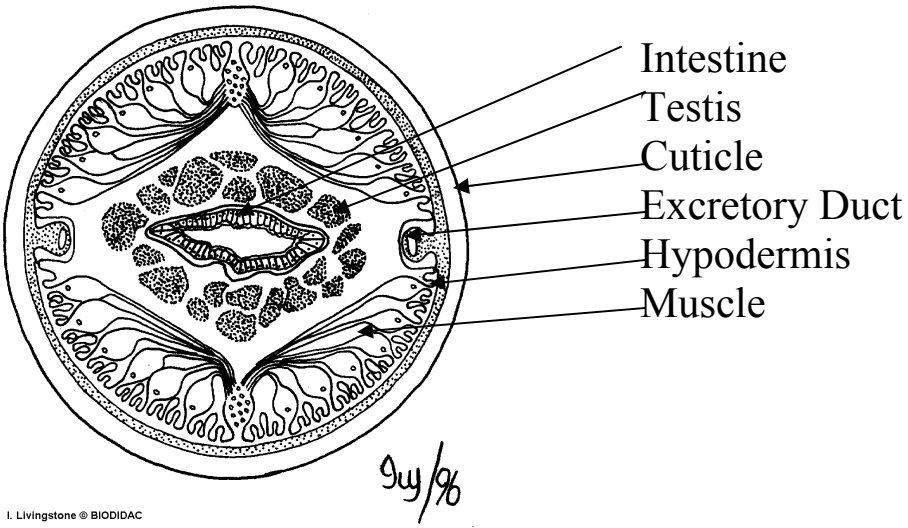

Fig. 2 Male Ascaris cross section (Fig 15-4 in your text)

Phylum **Mollusca** (snails, clams, oysters, squid, octopus, etc.)

Characteristics: muscular foot, head, mantle (shell), mantle cavity, viscera, radula.
Have organ systems, respiratory system (gills), circulatory system (open), digestive system (mouth, buccal cavity, esophagus, stomach, intestine and anus), excretory system with metanephridia.

Classes

Gastropoda: snails, slugs, nudibranchs, Marine, FW, terr. Largest most diverse group. Herbivores and carnivores Respiration by gills, or mantle cavity converted to a "lung". Some have internalized or even lost the shell (slugs)

Bivalvia: clams, oysters, mussels, scallops. Two shelled, no radula. Suspension feeders, ciliary gill action

Cephalopoda: squid, octopi, nautilus, cuttlefish. Foot modified into tentacles. All are carnivores. Shell internalized and then lost. Well developed sensory system, very intelligent.

Lab

Snails - observe the live apple snails in the lab. These are large snails from Florida. Most snails are adapted to scrape algae off of surfaces. The apple snails will be doing that in their tank.

1. Radula - The radula is the tongue of a snail. It is covered with small, hard teeth. The radula is used like a file to scrape algae off of rocks. Examine the slides of radulas under the microscope. Note the evenly arranged small teeth covering the radula.

Clam- observation of a dissected clam: follow lab manual, Fig 9-1a and b.
Note foot, mantle, gills, siphons, anterior/posterior abductor end and anterior/posterior muscles. Water flow and feeding. Note in lab manual caudal = posterior, cranial = anterior. You should be able to tell dorsal from ventral, anterior from posterior. You should also be able to trace the path of water through a clam.

1. Look at the live *Anodonta* mussels in the lab. This species is a member of the family Unionidae, the freshwater mussels. *Anodonta* is commonly found in the Mississippi River. It lives in the river bottom and strains particles out of the water with its gills. Be sure to look at the slides of glochidia. These are juvenile mussels. The female mussel attracts fish by wiggling a structure on her mantle. This structure looks like a small fish. When a real fish comes to investigate, the mussel expels a number of glochidia into the fish's mouth. Note that the glochidia look like little clamps. They do clamp onto the fish gills and live there for as much as a year sucking blood from the fish. Eventually, they drop off and embed themselves in the river bottom.

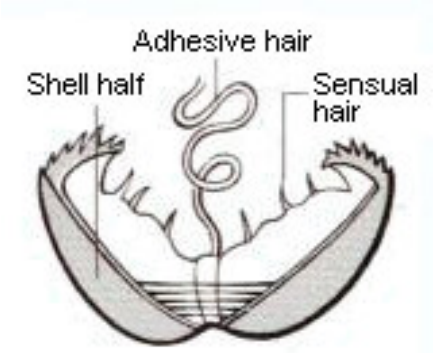

Figure 3. Glochidium of a freshwater mussel. This organism attaches to fish gills and functions as a parasite until it matures.

2. Look at the slides of trochophore and veliger larvae of clams. These are free-living larvae that float as plankton in the sea.

Squid: Follow lab manual. Look for:
external anatomy: tentacles, head, eyes, mantle, fins, siphon
Internal Anatomy: esophagus, stomach, digestive gland, gills, hearts, intestine, stomach, caecum. Is your squid male or female? (testes vs ovaries)
Look for the giant nerve cord that runs length of mantle.
Remove the pen, all that remains of the shell.
Remove the eye and look at it. Cornea (film-like), lens (hard silvery, pearl-like). Can go in through the mouth with forceps and remove the brain.

Slides: radula
Preserved: identify examples from the various classes of mollusks.
Examine the diversity of shells: can you identify these to class?
Fossils: examine the fossils, do any look like animals present today?