

## BSC 201L

### Lab #5: Pseudocoelomate (=Blastocoelomate) Animals AND Annelida

Use the text and figures in **Exercise 10 (The Pseudocoelomate Animals)** AND in **Exercise 12 (Annelids)** to aid your study of the prepared slides and preserved specimens; examine the additional specimens as indicated.

#### **Exercise 10 (The Pseudocoelomate Animals)**

What does **pseudocoelomate** mean? What does **blastocoelomate** mean?

- the secondary body cavity is not lined with peritoneum
- the mesodermal organs lie free in the pseudocoel (are not held in place by mesenteries)
- this fluid filled secondary body cavity is a persistent blastocoel

#### **Phylum Nematoda**, round worms

- wormlike body is round in cross section
- typically anterior end is bluntly tapered and posterior is sharply tapered
- four longitudinal cords comprise two lateral excretory canals and the dorsal and ventral nerve cords
- unique muscle cells, with muscle arm that extends to the nerve cord
- distinctive thrashing motion due to presence of only longitudinal muscles
- many spp. are free living, but we will see mostly parasitic nematodes in this lab

*Ascaris lumbricoides*, human roundworm – text pp. 157-161

- complete straight digestive tract
  - intestine is flattened, reproductive organs more rounded
1. Dissected specimens (Fig. 10-1) – internal/external views of male and female
    - **LABELS:**
      - Female – cuticle, intestine, ovary, oviduct, uterus
      - Male – cuticle, intestine, testis, vas deferens, seminal vesicle
    - female is generally larger in size
    - male has a hooked caudal end with two copulatory spicules
    - female genital opening (vulva) is near the middle of the body

**Observation:** *Ascaris* Dissection Biosmounts.

(Very helpful for labeling your dissections drawings.)

2. Slide – Fig. 10-2 – male cross section
  - testis < vas deferens < seminal vesicles
3. Slide – Fig. 10-2 – female cross section
  - ovary < oviduct < uterus (has eggs inside)

*Necator americanus*, hookworm – text pp. 162-163

4. Slide – adult female
5. Slide – infective larvae

*Trichinella spiralis*, trichina worm – text p. 163

- causes **trichinosis**, from eating raw or undercooked infested pork (“measly meat”); can also be found in cattle, deer, bear

6. Slide – Fig. 10-5

- pink stained muscle section with encysted trichina worms
- each cyst contains one coiled worm

*Rhabditis*, a free living soil nematode

- saprophagous, feeds on decaying plants and animals

7. Slide

*Dirofilaria immitis*, dog heartworm

DO NOT confuse this species with a nematomorph!!!

8. Preserved specimen

Observe **key recognition characters** for four other pseudocoelomate/blastocoelomate phyla (text pp. 164-166, Fig. 10-7).

**Phylum Rotifera**, rotifers – text pp. 164-165

- anterior, ciliated **corona**, used in movement of water for feeding and swimming
- **mastax** (pharynx) with **trophi** (jaws)
- **foot** and **toes**; benthic species have two toes; planktonic species often lack foot and toes
- many species with a **lorica** (thickened cuticle)

9. Slide

**Phylum Nematomorpha**, horsehair worms or Gordian worms – text pp. 165-166

- long, thin body is round in cross section; females often coil up in a knot
- typically anterior end is bluntly rounded and posterior is rounded or has caudal lobes
- larvae parasitize arthropods; adults are free living
- larvae lack digestive system; digestive system degenerate in adults

10. Preserved specimen – DO NOT confuse this specimen with a dog heartworm!!!

**Phylum Acanthocephala**, spiny headed worms

- cylindrical eversible proboscis uses rows of spines as an anchor
- body is bilaterally flattened, with transverse wrinkles
- no digestive tract
- all endoparasitic; larvae in arthropods, adults in vertebrates

*Macracanthorhynchus hirudinaceus*, spiny-headed worm – text p. 166

- juvenile is a parasite of beetle grubs; adult is a parasite of pigs

11. Preserved specimen

**Phylum Entoprocta**, entoprocts

- sessile, attached by a **stalk**
- ciliated tentacles (not retractable) roll inward to protect the mouth
- U-shaped gut with both mouth and anus openings located inside the circle of tentacles
- free-living

*Barentsia*

- a colonial, marine species

12. Slide

**Exercise 12 (Annelids)**

What does **eucoelomate** mean?

- the secondary body cavity is lined with peritoneum
- the mesodermal organs are covered with peritoneum and are held in place by mesenteries

**Phylum Annelida**, segmented worms

**Class Polychaeta**

- many setae (**chaetae**) on the **parapodia**
- parapodia are lateral locomotory appendages
- distinct head, typically with eyes, palps, tentacles
- [ lack **clitellum** ]
- mostly MW organisms

*Nereis virens*, clam worm – text pp. 188-189

13. Preserved specimen – Fig.12-1 A, B

- **LABELS:** tentacles, palps, pharynx, jaws, parapodium, setae
- look for short tentacles and everted jaws

14. parapodia – Fig. 12-1C

- **LABELS:** notopodium, neuropodium, setae
- notopodium is **d**orsal; neuropodium is **v**entral

*Chaetopterus*, parchment tube worm – text p. 189

- secretes U-shaped parchment tube through which it pumps and filters water
- **polymorphic** body: head, middle, posterior segments are different

15. Preserved specimen

- **LABEL:** parapodia

*Amphitrite*, spaghetti worm – text p. 190

16. Preserved specimen

- **LABELS:** parapodia, tentacles, gills
- look for gills just posterior to the long, tangled tentacles

*Arenicola*, lugworm

17. Preserved specimen

- **LABELS:** parapodia, gills
- look for tufts of gills near the small parapodia

## **Class Clitellata**

- **clitellum** (thickened, saddle-like group of segments) present in mature organisms
- no parapodia
- head poorly developed

### **Subclass Oligochaeta**

- a few setae
- mainly FW or terrestrial; a few MW species

*Lumbricus terrestris*, common earthworm – text pp. 190-196

18. Preserved specimen (external view) – Fig. 12-4

- **LABELS:** annuli, clitellum, setae, mouth, anus

19. Preserved specimen (internal view) – Fig. 12-3

- **LABELS:** one pair of nephridia, septa, pharynx, esophagus, crop, gizzard, intestine, seminal receptacle, seminal vesicles

**Observation:** Earthworm Dissection Biosmount (very helpful for labeling your drawing)

20. Slide (x.s.) – Fig. 12-5, 12-6

- **LABEL:** typhlosole
  - **typhlosole:** ridge or fold along inner wall of intestine, partly divides intestinal cavity; increases surface area
  - **chloragogue** tissue: food storage cells lining outside of typhlosole

### **Observations:**

- Live earthworm: study movement patterns; feel setae. (No drawing required.)
- earthworm cocoons. (No drawing required.)

## **Class Clitellata – cont'd**

### **Subclass Hirudinea**, leeches

- no setae, no **septa** (why not?)
- clitellum present in mature individuals, but it is difficult to observe
- anterior (=oral) and posterior (=caudal) suckers
- 33 or 34 segments internally
- annuli up to ~3 times as numerous as segments
- FW, MW, or terrestrial

Leeches – text p. 199-200

21. Preserved specimen – Fig. 12-8

- **LABELS:** annuli, oral sucker, caudal sucker
  - notice the lack of setae
  - clitellum (segments 10, 11, & 12) is not very prominent

*Haemopsis grandis*, a leech

22. Preserved specimen (internal view)

- notice lack of septa

**Observation:** Examine Annelids Biosmount. (Not necessary to draw).

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FOR NEXT LAB MEETING:

- download handout for Lab #6 and read Exercise 11 (The Molluscs)
- write out each taxonomic summary in your Laboratory Specimen Notebook BEFORE lab