

Annelids

- 1) Phylum: Annelida
 - a) Members in this phylum are segmented worms including bristle worms, leeches, and earthworms.
 - b) They are distributed worldwide in marine, freshwater, and terrestrial habitats
 - c) Each species has segments that contain circulatory, respiratory, nervous, and excretory structures separated by **septa**.
- 2) Earthworms
 - a) Feeding
 - i) Earth worms feed by ingesting dirt and digesting organic nutrients
 - ii) To do this they have a mouth and a pharynx to draw in the particulate.
 - iii) After food is drawn in it travels down the esophagus and into a holding chamber called the **crop**
 - iv) The crop holds the food until it is passed to the **gizzard** for mechanical processing
 - v) The earth worms have proportionally long vascularized intestines to absorb nutrients.
 - b) Circulatory
 - i) Annelids have a **closed circulatory system** with arteries and veins.
 - (1) This allows for direct absorption of nutrients and oxygen AND allows it to be transported efficiently without mixing.
 - ii) Annelids also have hemoglobin based blood which is better for oxygen transport
 - c) Respiratory
 - i) Some aquatic annelid's have gills while others (like the earthworm) absorb oxygen through their skin
 - ii) Having a highly vascularized body allows for more oxygen to be absorbed and brought to areas of the body that don't have direct contact with the environment.
 - d) Waste disposal
 - i) In each segment worms have a specialized structure called a **nephridia** that filters metabolic waste out of the blood (like a human kidney)
 - ii) Once the waste are out they go into a bladder and finally out a tube to be excreted.
 - e) Locomotion
 - i) Earth worm type annelids use muscles connected to the septum to constrict the body and then expand it in a direction. They also have their bodies covered in **setae** to create friction in the soil so they can move.
 - f) Reproduction
 - i) Annelids are hermaphroditic but practice cross fertilization
 - ii) The anterior end of one worm will line up with the posterior end of another.
 - iii) They will be held together by mucus secreted by the **clitellum**
 - iv) Both will produce sperm which travels down its **seminal canal** and into the others seminal receptacle for storage.
 - v) After the sperm is inserted the two will detach and go their separate ways.
 - vi) Now the worm secretes around it clitellum a mucous/chitin band that forms a cocoon.

vii) This cocoon moves forward collecting eggs from oviducts and sperm held in the seminal receptacles

viii) Fertilization takes place in the cocoon and the cocoon falls off for the eggs to hatch into little baby worms.

3) Leeches

a) Leeches are almost all freshwater

b) They range in size from 2 cm to 20cm

c) Feeding

i) Many are predators of insects, however some are parasites of vertebrates feeding on blood

(1) Parasitic forms have a proboscis or 3 jaws filled with teeth.

(2) They burrow into the flesh of their host and secrete an anti-coagulant that prevents blood from clotting.

(3) They can consume up to 7 times their body weight in bodily fluids and digest their meal very slowly.

d) Reproduction

i) Reproduction of leeches is similar to other segmented worms with one main exception

(1) Leeches have a penis or a "hypodermic" needle for injecting the other with sperm.

(2) With this exception all else is the same as described for earth worms.

e) Cardiovascular/respiration/locomotion

i) Same as above

4) Polychaetes

a) In Annelida there are also groups of "worms" that burry themselves in the substrate in aquatic environments.

b) They have complex closed circulatory systems like the other annelids

c) Use gills to get oxygen

d) Have feathery "arms" that project out to grasp food.

e) Most have separate sexes

i) Gonads are not permanent they only develop as temporary swellings and are put into the gastrovascular cavity to be expelled.