



Phylum Platyhelminthes

Learning outcomes: Describe the unique characteristics of Platyhelminthes

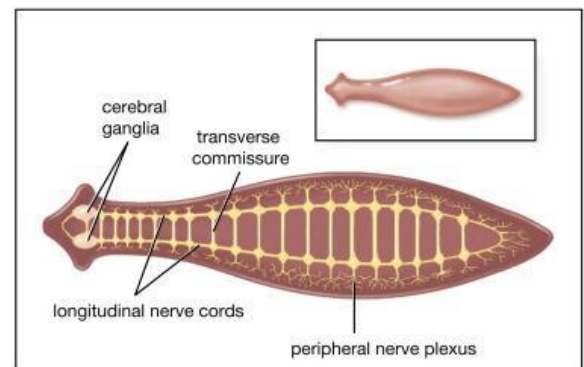
Characteristics of Platyhelminthes



- Known as **flatworms**
- **Soft bodies, unsegmented**, and flattened dorsoventrally
- **Triploblastic** animals – possess three cell layers (ectoderm, mesoderm and endoderm)
- **Bilaterally symmetrical** and **acoelomate** (no internal body cavity)
- Exhibit **cephalisation** – sense organs are concentrated at the anterior ends/head

- Has ladderlike nervous system
 - Comprises a pair of anterior ganglia – serves as the brain

Nervous system of the flatworm (*Planaria*)

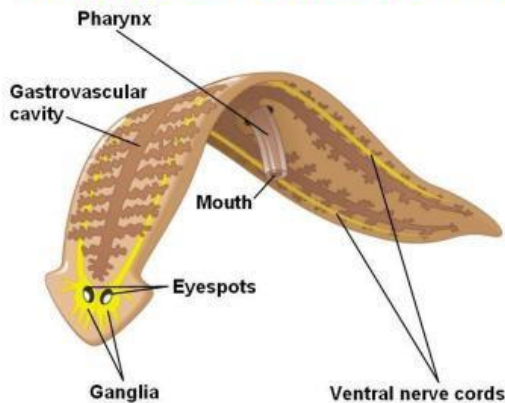


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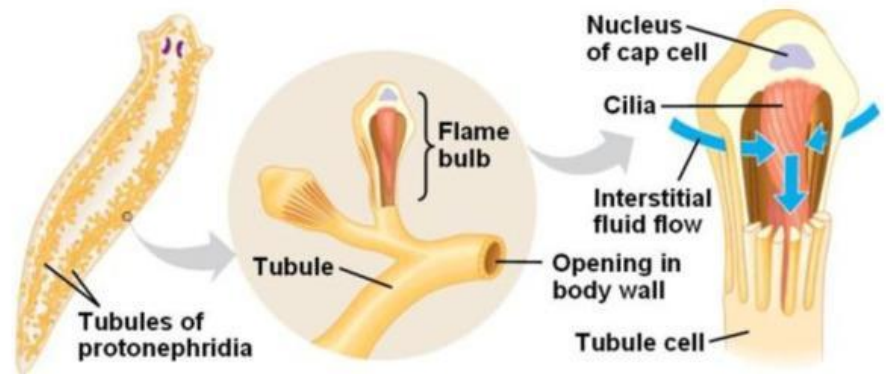
Phylum Platyhelminthes

Learning outcomes: Describe the unique characteristics of Platyhelminthes

Characteristics of Platyhelminthes



- **Digestive system is incomplete** – gut is sac like with single opening, pharynx extends for food gathering



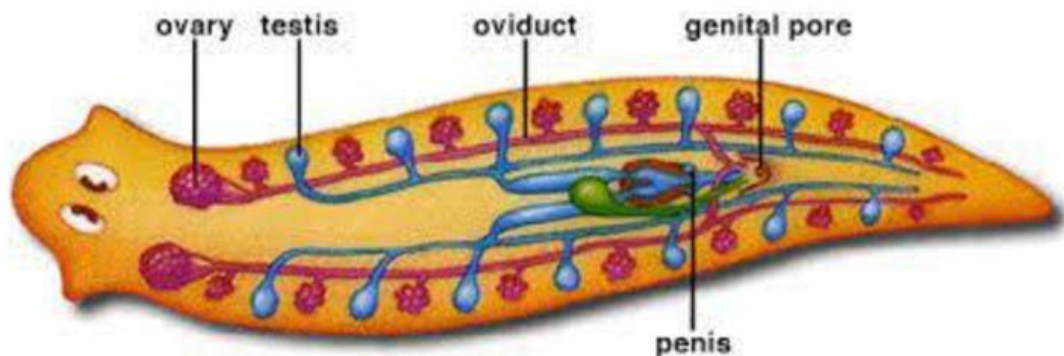
- Excretion and osmoregulation – controlled by ciliated flame cells located in protonephridia

Phylum Platyhelminthes

Learning outcomes: Describe the unique characteristics of Platyhelminthes

Characteristics of Platyhelminthes

- Reproduction: **asexual and sexual**
- Most are **hermaphrodite**: both female and male reproductive organs present in adult worms



Phylum Platyhelminthes

Learning outcomes: State the classification of Platyhelminthes into four classes

Classification of Platyhelminthes

- Divided into 4 classes
 - 1) Class Cestoda – example; *Taenia sp.* (tapeworm)
 - 2) Class Trematoda – example; *Fasciola sp.* (flukes)
 - 3) Class Turbellaria – example; *Planaria sp.* (free-living)
 - 4) Class Monogenea – example; *Dactylogyrus sp.* (flukes)

- **Fluke (non-segmented)** and **tapeworm (segmented)** are parasitic, while class Turbellaria is free living

Turbellaria
(free-living)



Cestoda
(tapeworms,
parasites)



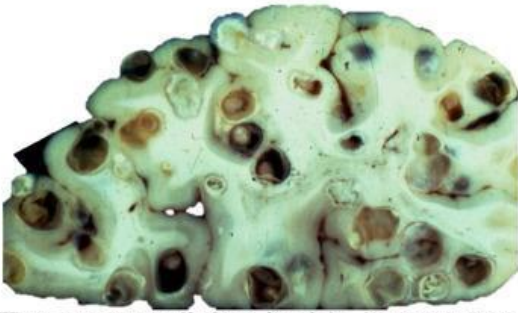
Trematoda
(flukes,
parasites)



Phylum Platyhelminthes

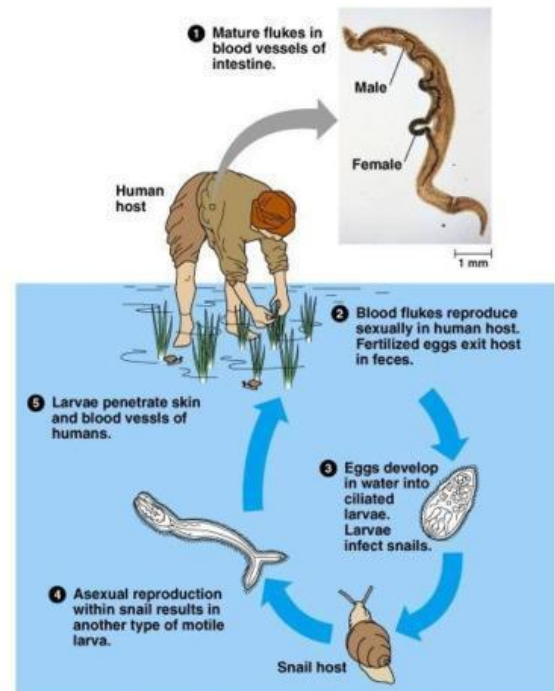
Platyhelminthes as parasites

- Cestodes and flukes causes important disease in humans and livestock
- **Schistosomiasis** (snail fever) – an important platyhelminth disease causing suffering and some deaths in tropical countries.



Tapeworms living inside human brain

- **Neurocysticercosis** – larvae of pork tapeworm penetrate the central nervous system, a major cause of acquired epilepsy worldwide



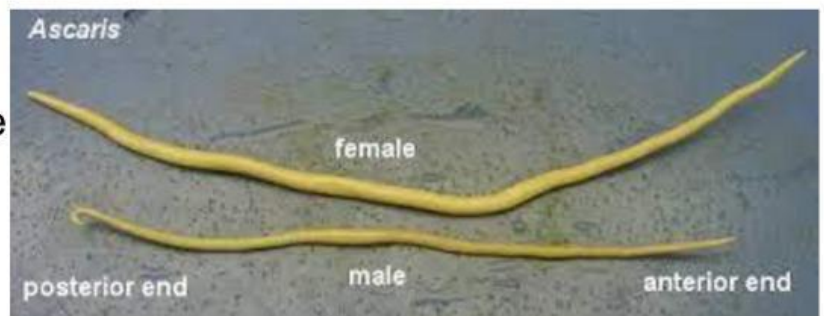
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Phylum Nematoda

Learning outcomes: Describe the unique characteristics of Nematodes

Characteristics of Nematodes

- Known as **roundworms**, many are parasitic
- **Bilaterally symmetrical, unsegmented** worms
- Body elongated, cylindrical and tapered at both ends
 - Covered with tough flexible cuticles, give protection and body shapes – molts as the worm grows
- E.g.: *Ascaris sp.*
- Most are **dioecious** (separate sexes)

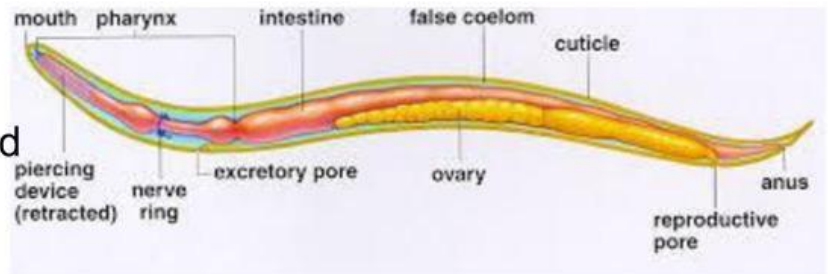


Phylum Nematoda

Learning outcomes: Describe the unique characteristics of Nematodes

Characteristics of Nematodes

- **Complete digestive system** with a mouth and anus
- **Do not possess organs for circulation/excretion.** Diffused gas can dissolve directly through the body wall.



- **Triploblastic, pseudocoelomate**
 - Have **body cavity but incompletely lined with mesoderm**
 - **Internal organs** (intestine and reproductive organs) are suspended within the fluid-filled **pseudocoelom**
 - **Fluid-filled pseudocoelom** – as hydrostatic skeleton and transport nutrient

Phylum Nematoda

Learning outcomes: Describe the unique characteristics of Nematodes

Characteristics of Nematodes

- *Brugia malayi* – roundworm nematode which causes lymphatic filariasis or elephantiasis
 - *B. malayi* is transmitted by mosquitoes that is restricted to Southeast Asia
 - Adult worms reside in lymphatic vessels – caus blockage. Lymphatic fluid cannot flow through and the vessels and causing limbs to swell.



Brugia malayi



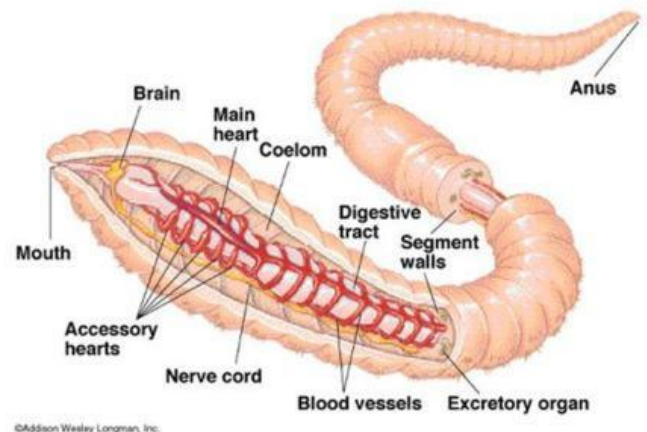
A person infected by *Brugia malayi*

Phylum Annelida

Learning outcomes: Describe the unique characteristics of Annelida

Characteristics of Annelida

- Annelids – **earthworms**, **polychaetae** worms and **leeches**
- **Segmented** body both externally and internally
 - Separated internally by septa, externally by annuli
 - Segments contain the same sets of organs
- **Segmentation = metamerism**. The advantages are:
 - Can control movements by separate segments independently

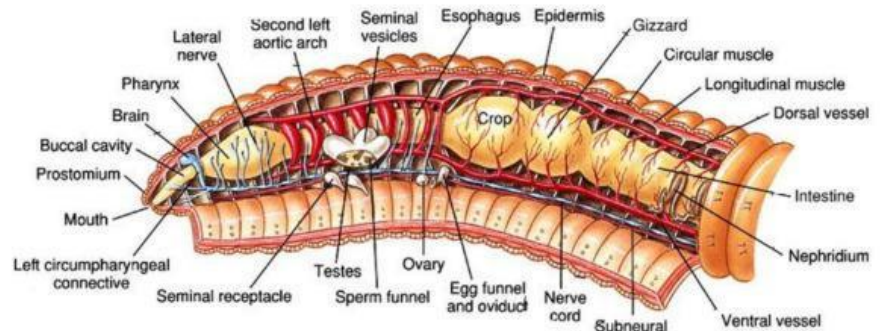
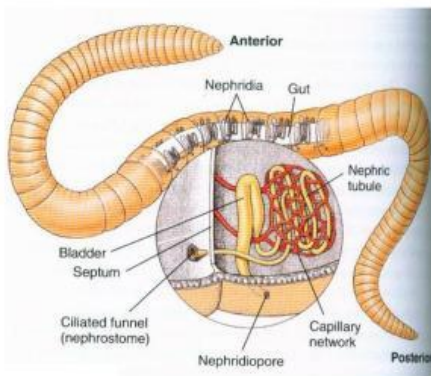


Phylum Annelida

Learning outcomes: Describe the unique characteristics of Annelida

Characteristics of Annelida

- Body wall – made up of circular and longitudinal muscles
 - Body covered by pliant cuticle which may have chitinous hair-like structure called setae/chaeta (except for leaches)
- **Triploblastic, bilateral symmetry** and **well-developed coelom**, organs are well developed.
- **Monoecious** or **dioecious**
- Excretory system - through nephridia



Phylum Annelida

Learning outcomes: State the classification of Annelida into 3 classes

Classification of Annelida

- Divided into 3 classes
 - 1) Class Oligochaeta; e.g.: *Pheretima* (Earthworm)
 - 2) Class Polychaeta; e.g.: *Nereis* (Rag worm)
 - 3) Class Hirudinea; e.g.: *Hirudo* (Leech)



Pheretima sp.



Nereis sp.



Hirudo sp.

Phylum Annelida

Roles of Annelida

- Earthworms – important in the construction and fertility **maintenance of the soil**
 - Earthworm bringing nutrients up to the surface layer of the soil and assisting in the breakdown of organic matter in or on the surface of the soil
 - As they move – earthworms aerate the soil and enrich it with nitrogenous waste
 - Burrowing action – allow air to penetrate the soil and provide channel for water to drain and enter.



Earthworms are the best aerator for your soil. They make it easier for roots to grow more deeply.

As they consume organic matter and mineral particles, earthworms excrete waste in the form of casts, a beneficial aggregate for plants.



Fill up the table below



Phylum	Platyhelminthes	Nematoda	Annelida
Level of organization		Triploblastic; pseudocoelomate	
Segmentation	unsegmented		
Body shape			
Digestive system			Complete with mouth and anus
Reproductive system			
Presence of chaetae			