

Lab 3

Platyhelminthes (Flat worms)
&
Nematoda (roundworms)



<http://dreamwater.com/biz/mactode>

Coming up in two weeks!

First Practical Exam – Oct 1

~30 stations (60 points)

1-1 1/2 minutes per station, plus free time

~5 extra credit points available

Coming up in two weeks!

Field Trip

Saturday, March 7th at 1:30pm (not 12:30pm)

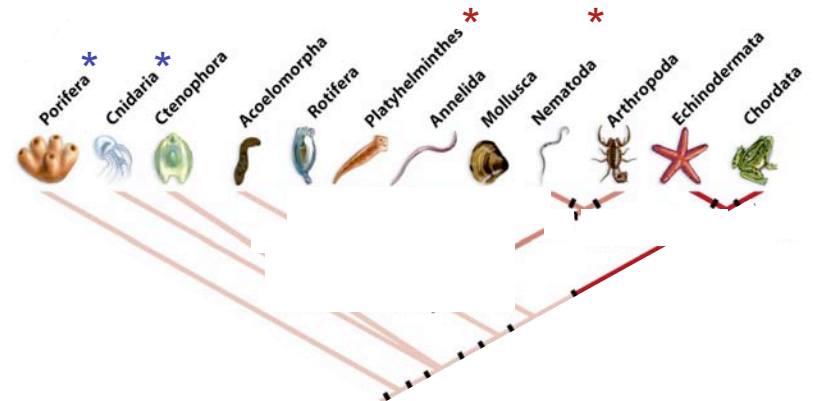
--OR-- Sunday, March 8th at 2:00pm

Shaw's Cove -- Laguna Beach

Must provide own transportation

Field trip date sign-up and carpool list available today.

Continuing our Animal Tour...





Porifera

no symmetry
no tissues
no head or brain



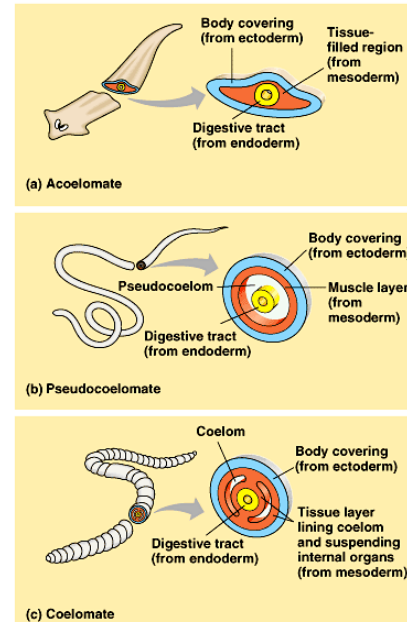
Cnidaria

radial symmetry
diploblastic
(two germ layers)
no head or brain



Platyhelminthes

bilateral symmetry
triploblastic
(three germ layers)
head with simple brain



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Traditionally organized by
body cavity (coelom)

Platyhelminthes = Acoelomate
No body cavity

Nematoda = Pseudocoelomate
Cavity between mesoderm
and endoderm

Annelida = Coelomate
Cavity completely lined
by mesoderm

Phylum Platyhelminthes (flatworms)

Chapter 9

• Basic characteristics

- Bilateral symmetry
- Triploblast (endoderm, ectoderm, mesoderm)
- Cephalization
- Acoelomate (no body cavity)
- Organs



Beef tapeworm



(by P.W. Pappas and S.M. Wardrop)



Phylum Platyhelminthes (flatworms)



• Classes

- Turbellaria (free-living flatworms; planarians)
- Trematoda (flukes)
- Cestoda (tapeworms)



Beef tapeworm

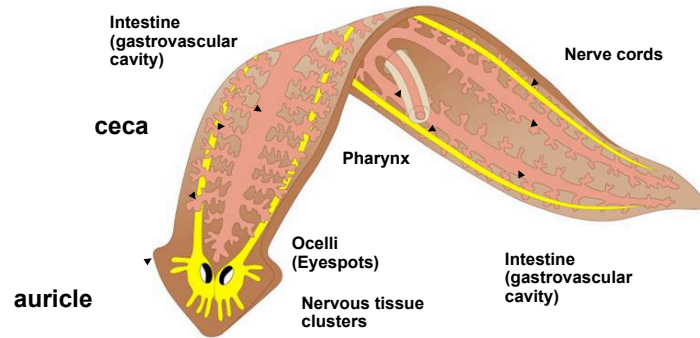


(by P.W. Pappas and S.M. Wardrop)

Class Turbellaria

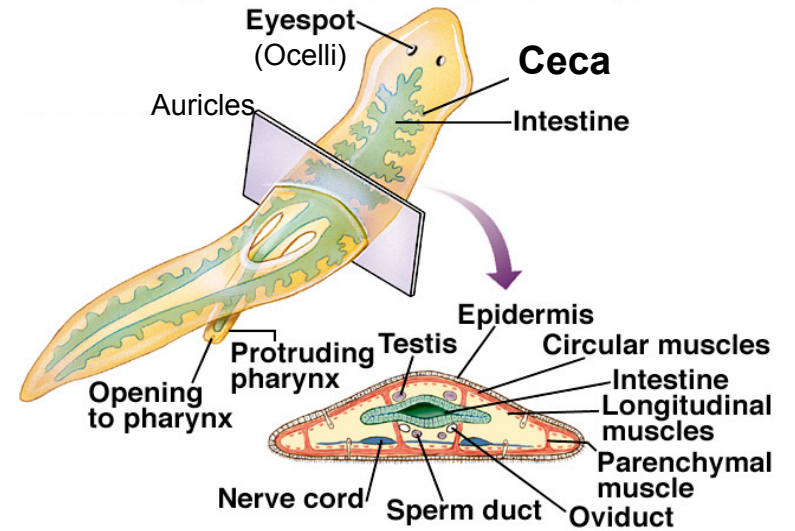
Dugesia

- Free-living flatworm



Class Turbellaria - *Dugesia*

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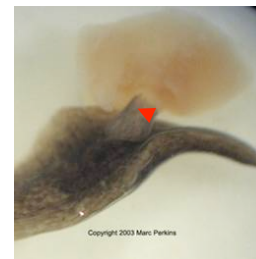


Turbellaria reproduction

- Hermaphroditic
- Asexual reproduction
 - Can split in two, regenerating any parts that are missing from each half



Observe a live planarian feed!

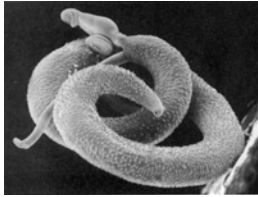


Pharynx

Class Trematoda

1. *Clonorchis* – Human liver fluke
2. *Fasciola* – Sheep liver fluke
3. *Schistosoma* – Human blood fluke

All parasitic!



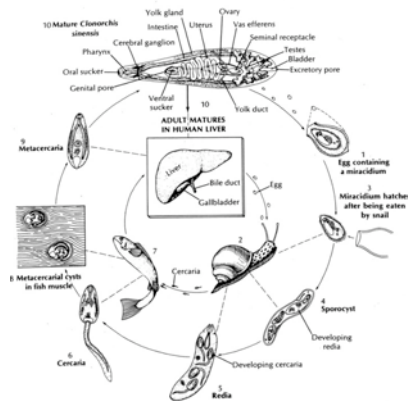
Clonorchis – human liver fluke

- Adult lives in humans
 - Live in the liver, feeding on bile
 - Sexually reproduce in humans
 - Definitive host
- Adults are hermaphroditic
 - Produce 1 egg every 30 seconds
 - Eggs exit human through feces

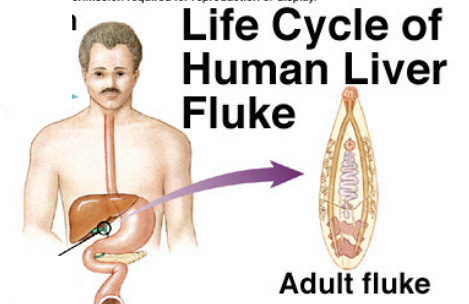


What we'll look at with *Clonorchis*

- Different life stages
 - Redia
 - Cercaria
 - The adult
- Also know where to find it in nature
 - Human, fish, and snail



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Schistosoma – human blood fluke

- Second most important parasite after Malaria (WHO)
 - 200+ million people infected
 - 600+ million people at high risk
 - Most in Africa, though some in S. America and Asia

<http://www.who.int/ctd/schisto/dates.htm>

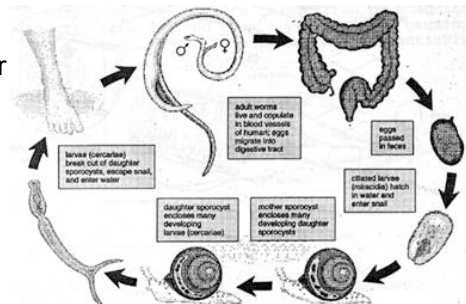
Schistosoma – human blood fluke

- **Adults are dioecious**
 - Separated male and female stages
 - Unusual for a platyhelminth
- **Adults live in human blood**
 - Male and female live in permanent union

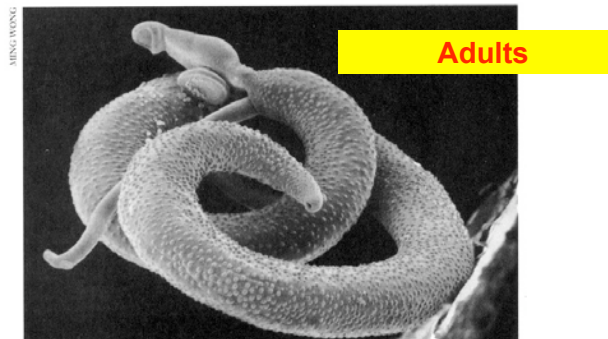
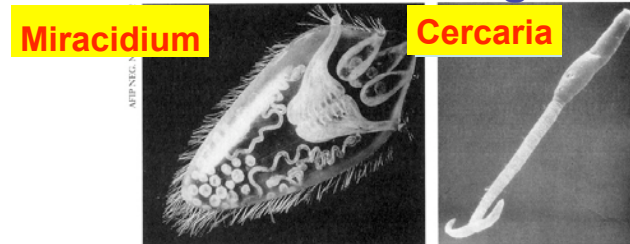


Schistosoma life cycle

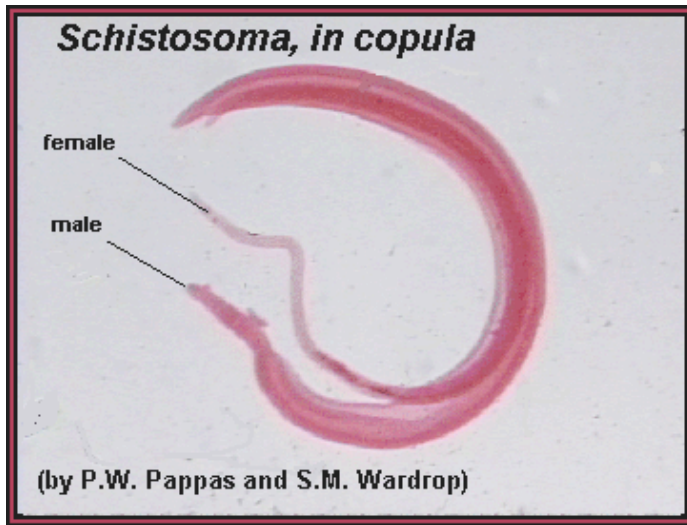
- **Adults live in blood**
 - Females push eggs through colon wall
- Eggs leave and hatch into **miracidia** (enter snail)
- **Miracidia becomes sporocysts**
 - Sporocysts create **cercariae**
- **Cercariae**
 - Leave the snail, enter water
 - Enter humans directly through skin



Schistosoma images

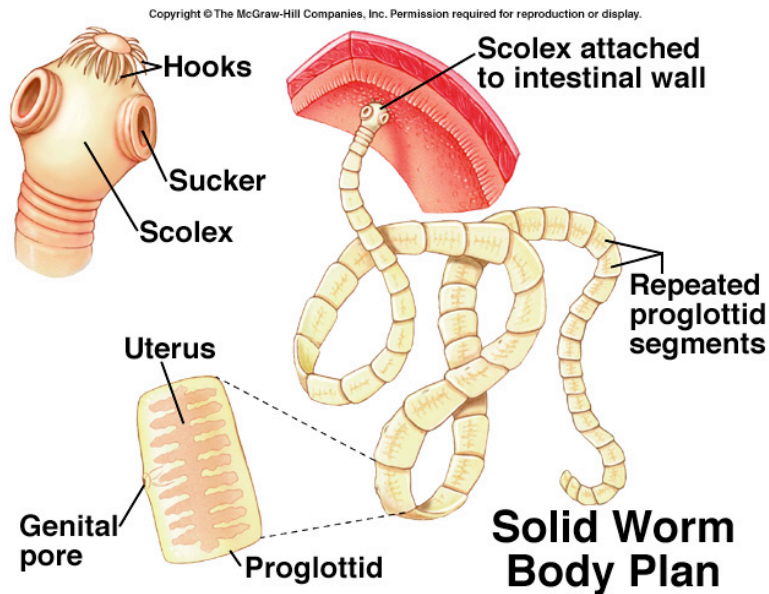


- **Schistosoma** - identify male and female

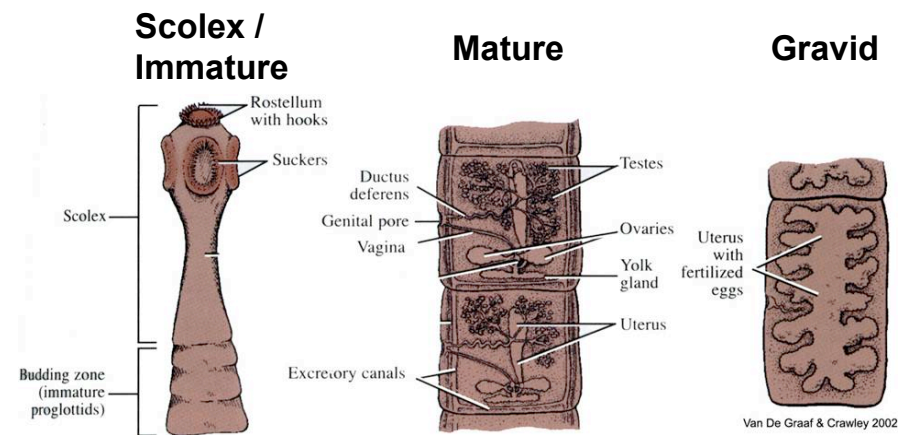


Class Cestoda

- The **tapeworms**...
- 28 foot tapeworm found in a human.
- Can grow as big as 35 meters (that's 82 feet!)



Taenia proglottids



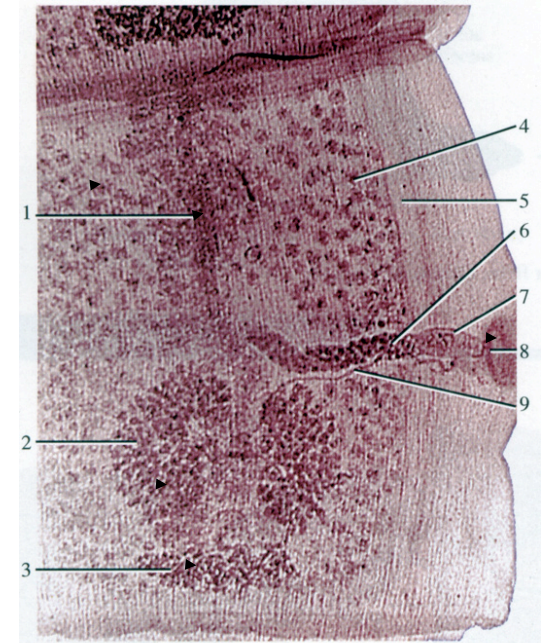
Taenia – life cycle

- Scolex produces **proglottids** (“segments”)
- Fully matured proglottids break off into feces
- Secondary host consume eggs
- Eggs hatch inside secondary host, and eventually turn into a **cysticercoid**
 - Cysticercoids encyst in muscle of secondary host

Secondary host must be eaten to complete cycle

Mature Taenia proglottid

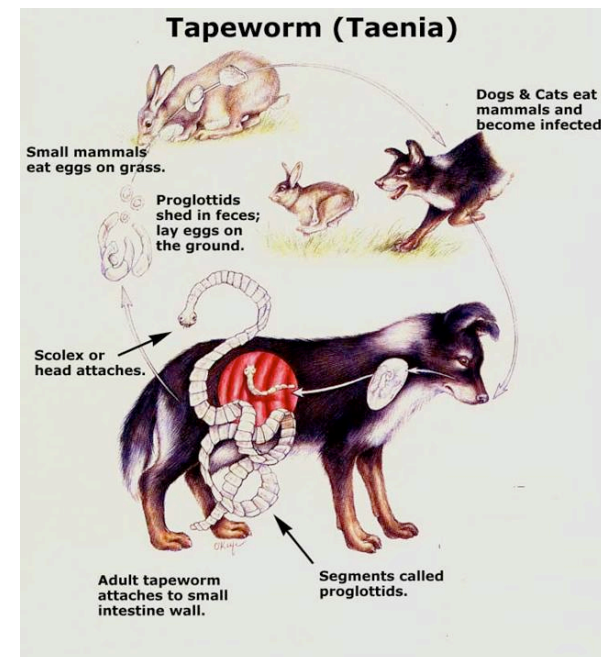
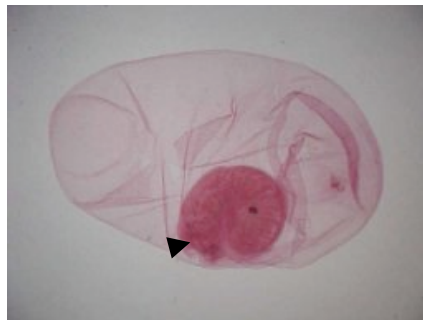
Testes
Uterus
Genital pore
Ovary
Yolk Gland



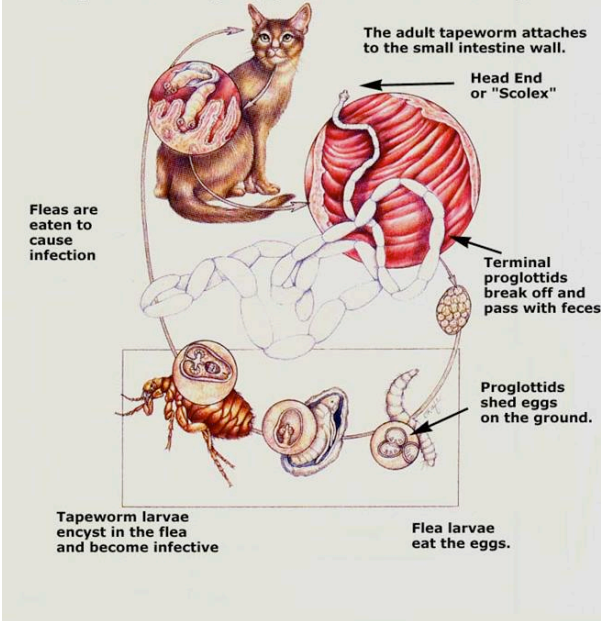
Taenia – life cycle

- **Cysticercoid**: a fluid filled sac containing a **scolex**. Upon ingestion the scolex begins development into an adult.

Scolex



Tapeworm (*Dipylidium caninum*)



Phylum Nematoda (roundworms)

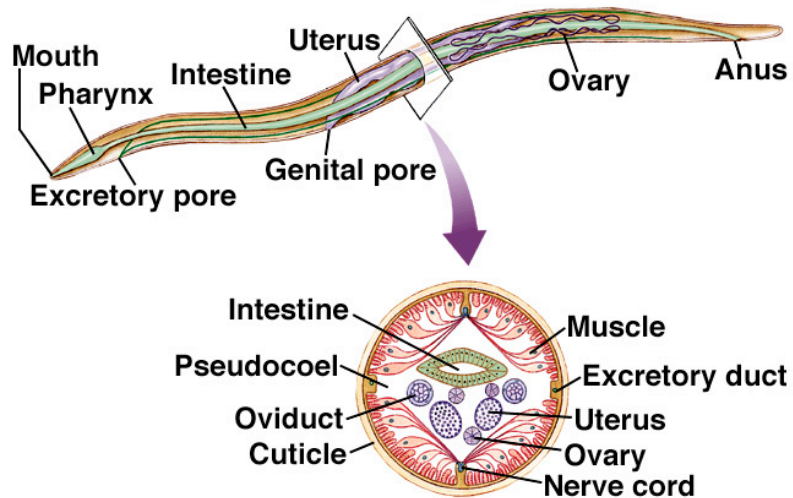
Chapter 10

- Characteristics
 - Triploblastic
 - Pseudocoelomate
 - Complete digestive tract
 - Most are dioecious
 - Longitudinal muscles only
 - Spindle-shaped (pointed at both ends)



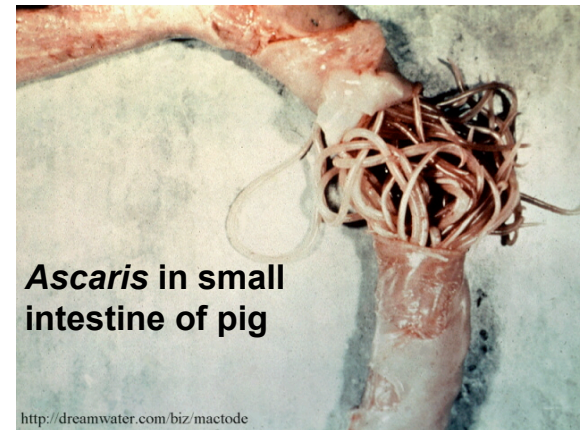
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Nematode Body Cavity



Nematodes to observe:

- *Ascaris*
 - Parasitizes many domestic animals, including humans, causes lung disease



Nematodes to observe:

- ***Trichinella***

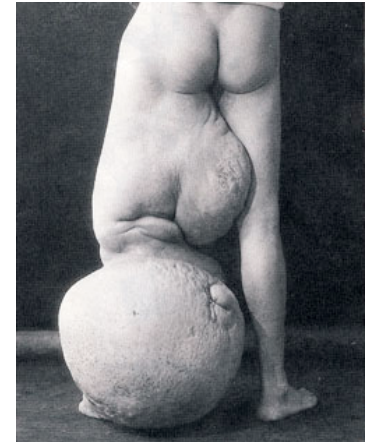
- Encysts in pork muscle
- Causes trichinosis



Be sure to also observe:

- ***Wuchereria***

- Larvae live in / clog lymph vessels
- Causes elephantiasis



Elephantiasis

Next week...

- Exploring internal anatomy of annelids and molluscs
- You MUST have your dissection kit by then



www.indigo.com
Intermediate Dissecting Kit

Don't forget to look
at the side
benches.

There is more to see!