Ecological Parasitology Lab 8

Platyhelminthes
Classification

• **Kingdom: Animalia**
  – Phylum: Platyhelminthes - flatworms, lack body cavity and specialized respiratory/circulatory organs, well developed reproductive system, incomplete digestive system
    • Class: Cestoda (tapeworms, covered last week)
    • Class: Turbellaria (freeliving)
    • Class: Monogenea (parasites of fish gills/skin)
    • Class: Trematoda
      – Subclass/order:Digenea
Morphology

• Holdfast organ
  – glandular adhesive discs and pits
  – sometimes true suckers and hooks
  – Adults usually in digestive system of vertebrate- up to 80 ft and size of squash!!!
Life Cycle

Definitive host → Adult worm → Operculate eggs

Eaten

Metacercaria (sometimes encysted, possibly in/on another intermed. Host or veg.)

Cercaria emerge

Miracidium hatches out

Burrows into Intermediate host (usually a gastropod)

Redia

Sporocyst
Life Cycle

Eggs- operculate

*Schistosoma mansoni*

*Fasciola hepatica*

*Schistosoma haematobium*
Life Cycle

Miracidium - ciliated

Schistosoma mansoni

Fasciola hepatica

Eye Spots

Germinal Cells

Cilia
Life Cycle

Sporocyst- transient stage, contains developing redia
Life Cycle

Redia- contains many developing cercaria

Fasciola hepatica
Life Cycle

Cercaria - swimming stage

Schistosoma sp.

Metacercaria - cyst stage

Fasciola hepatica
Life Cycle

Adult: *Clonorchis sinensis*
Today’s Parasites

• Digenes:
  – *Fasciola hepatica*
  – *Schistosoma spp.*
  – *Paragonimus westermani*
  – *Clonorchis/Opisthorchis sinensis*
  – *Echinostoma revolutum*

• Monogenea:
  – *Gyrodactylus* sp.
  – *Desyonychocotyle* sp.
  – *Entobdella bumpusi*
**Fasciola hepatica**

- Sheep liver fluke (also humans-rare, cattle horses, goats, rabbits, pigs, dogs, squirrels, etc.)
- Snail intermediate host
- Become infected by eating vegetation/water with metacercaria
Fasciola hepatica
**Schistosoma spp.**

- **Schistosomiasis**
  - Kill and disable more people than any other parasite except malaria (200 million infected)
  - Enlarged liver/spleen, calcified bladder, devormed ureter, kidney malfunction
- Females live 30 years in blood vessels, especially in abdomen region
- Snail intermediate host
- Cercaria burrow into skin
Schistosoma sp.

Schistosoma mansoni

Female

Male

Peter Embden

40 μm
**Paragonimus westermani**

- Human lung fluke (also other mammals)
- Parts of Asia, Africa, S. America, 7-50% infected
- Intermediate hosts: snails and crayfish/freshwater crab
- Infected by eating metacercaria in crustacean
Clonorchis (Opisthorchis) sinensis

- Chinese liver fluke
- Good example of general fluke morphology
- Intermediate hosts: snail, fish
- Infected by eating uncooked fish
Echinostoma revolutum

- Parasite of birds (mostly) and humans
- Intermediate hosts: snails and frogs

http://www.dpd.cdc.gov/dpdx/html/Frames/MorphologyTables/body_morph_figure9.htm
Some other cool Digenes

- Videos on Robert Poulin’s website
  http://www.otago.ac.nz/parasitegroup/downloads.html

- Dan’s project
  - http://www.youtube.com/watch?v=8dJMPJfwyBA starting around time 5:20-5:30

Fig. 1: multiple nodules in the palpebral conjunctiva of a capybara infected with specimens of Philophthalmus tachrynosus. Bar = 10 mm.
Monogenea

- *Gyrodactylus*- viviparous!, parasite of fish gills, often carry bacteria
- *Desyonchocotyle*- skin parasite of rays
- *Entobdella bumpusi*- skin parasite of rays