Family Schistosomatidae

2. Three primary species
   a. *Schistosoma mansoni*: middle east
   b. *S. japonicum*: far east
   c. *S. haematobium*: Africa, Central America and Caribbean
   d. *S. intercalatum*: Africa, similar to S.H
   e. *S. indicum*: India

World Distribution of Schistosomiasis

Note that the disease is associated with very old human populations.

Schistosome Hosts

3. Note different snail hosts in different schisto species:
   a. *S. haematobium*: snail is Bulinus
   b. *S. japonicum*: snail is Oncomelania and some others

Schistosome Hosts

c. *S. indicum*: snails are *Indoplanorbis, Planorbis, Lymnea*.

d. *S. mansoni*: snail is *Biomphalaria*
Schistosomiasis is usually contracted at community water sources.

Control of schistosomiasis often involves use of molluscicides.

Schistosome Life Cycles

Each have slightly different pathology due to different locations in definitive hosts.
Schistosoma haematobium

Schistosoma japonicum
Schistosoma japonicum

S. japonicum Pathology
Figure 16.8
Scanning electron micrograph of endothelial cells and eggs of *Schistosoma japonicum* in vitro. The eggs have just been expelled by a female worm, and the endothelial cells are moving over them.
Schistosoma mansoni eggs in the liver of an experimentally infected mouse

S. mansoni Pathology
**Schistosoma Differences**

a. Eggs  
b. Life cycle  
c. Pathology

**Acquired immunity**

1. A possible context for baptism?

**Order Strigiformes**

d. Dioecy  
1. high densities of males and females in same host?  
2. Specialization as one sex or the other can yield greater fitness than that obtained by individuals with both sexes.

**Schistosoma douthetii**

e. Swimmers itch  
1. the scourge of midwestern prom nights

[Images of parasites and life cycles]
Order Opisthorchiformes
1. *Opisthorchis sinensis*
   a. oriental liver fluke
   1. life cycle diagram
   2. very common in locations where raw fish is eaten (26% in NYC)
3. long term infections and cancer.

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**Heterophyes heterophyes**
a. One host is *Cerithidia*, common in Japan, also NA
   b. sporocyst and redia generations, lots of cercaria
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**Order Plagiochiformes**
1. General characters
   a. lots of larval and juvenile similarities.
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Order Plagiochiformes

*Paragonimus westermani*

a. lung fluke
b. lung -> eggs in feces -> miracidium penetrates snail -> sporocyst -> redia -> cercaria on crustacea -> eaten by host -> worms penetrate duodenum, migrate to lungs.

Order Plagiochiformes

2. Common in places where raw crustaceans are eaten.
3. Diagnosis by red sputum in which eggs are passed.

Order Plagiochiformes

*Paragonimus westermani*

1. Parasite of dogs that eat raw salmon.
2. Standard trematode life cycle, but also involves *Neorickettsia* bacteria; causes “salmon poisoning.”
3. Worms don't hurt dogs much, but bacteria do.