# BIO 475 - Parasitology Spring 2009

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http://www4.nau.edu/isopod

#### Lecture 13

















# **Order Echinostomatiformes**

*Fasciola spp.* 2.High prevalence in domestic cattle, human populations a. 38% of children in Bolivia b. 17% of cattle in Montana











# **Order Echinostomatiformes**

- Fasciolopsis buski
- 1. parasite of pigs and humans in orient
- 2. large, 7.5 cm), causes intestinal obstructions



## **Order Echinostomatiformes**

- c. *Fasciola gigantica*1. very large (7cm long)
- 2. formerly wild ungulates, now present in domestic species.









#### Order Strigiformes

*Alaria* spp. 1. parasite of foxes; *A. americana* in NA 2. Slight modifications in life cycle. a. Mesocercaria in tadpoles, later in frogs.



Figure 16.3 Mesocercaria of Alaria americana in human lung at autopsy showing hemorrhage around the worm. In this fatal case nearly every organ of the body was infected, presumably as a result of eating underscohed forces' law:



# **Order Strigiformes**

 b. Builds up infections in snakes (paratenic host)
 Can massively infect canids or humans.

c. Diplostomulum metacercaria remain circulating in lactating females, be transmitted to offspring.



#### Order Strigiformes

In humans, mesocercaria can end up in eye, kidney, other organs with high vascularity.



# **Order Strigiformes**

b. Uvulifer ambloplitis
1. causes "blackspot" on freshwater fish

a. this is the neascus metacercaria
b. eggs shed, miracidium invades snails (Helisoma),



# Uvulifer ambloplitis

c. Two sporocyst generations in 6 weeks.
d. cercariae leave snail, float to surface and chase fish
e. form metacercaria - melanin deposited by fish
makes black spots.



### **Uvulifer ambloplitis**

1. Not infective to humans, but usually unacceptable to most fishermen.



# Family Schistosomatidae

- 2. Three primary species
- a. Schistosoma mansoni: Africa, Middle East, Central America and Caribbean
- b. S. japonicum: far east

c. S. haematobium: Africa d. S. intercalatum -Africa, similar to S.h e. S. indicum - India



Figure 16.5 Scanning electron micrograph of male and female Schistosoma mussion. The female is lying in the gynecophoral groove in the ventral surface of the male. (Bar = 2 mm.) Controy of D. W. Halon.







Species Group	Distribution <sup>a</sup>	Snail Host	Mammalian Host <sup>a</sup>
Schistosoma haematobium			
S. haematoblum	Af & ad	Bulinus	Pr
S. intercalatum	Af	Bulinus	Pr
S. mattheei	Af	Bulinus	Pr, Ar
S. bovis	Af & ad	Bulinus, Planorbarius	Ar
S. curassoni	Af	Bulinus	Ar
S. margrebowiei	Af	Bulinus	Ar
S. leiperi	Af	Bulinus	Ar
Schistosoma mansoni			
S. mansoni	Af, SA	Biomphalaria	Pr. R
S. rodhaini	Af	Biomphalaria	R, C
5. edwardiense	Af	Biomphalaria	Ar
S. hippopotami	Af	7	Ar
Schistosoma japonicum	and the second second		
S. Japonicum	SEA	Oncomelania	Pr. Ar, R. C. Pe
5. mekongi	SEA	Neotricula	Pr. C
S. sinensium	SEA	Neotricula	R
5. malayensis	SEA	Robertsiella	Pr. R
Schistosoma indicum			
S. indicum	SEA, SWA	Indoplanorbis	Ar
S. spindale	SEA, SWA	Indoplanorbis	Ar
S. nasale	SWA	Indoplanorbis	Ar
S. incognitum	SEA, SWA	Lymnea, Radix	Ar. R. C



# **Schistosome Hosts**

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* 





# **Schistosome Life Cycles**



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

Figure 16.5 Scanning electron micrograph of male and female Schiatosoma mansoni. The female is lying in the gynecophoral groove in the ventral surface of the male. (Bar = 2 mm.) Convey of D. W. Holos.



Alaria canis Fig. 1. Life cycle of Alaria canis (4. americano). 1 The adults (2.5-4.2 mm long) live in the anterior third of the small intestine of the final hosts (canids). 2 The operculate cggs are unembryonated when laid. 3 Larvae (miracidia) hatch in about 2 weeks after reaching water. 4 Miracidia swim actively and enter sevent species of helisomid small (first inside which mother and daughter sporocyst are produced. The latter give rite to 5 The leave the small during daylight hours and swim to be water surface, where they hang upside down. 6 If tadpoles (is intermediate hosts of the second type) pass by, the cercariae penetrate become transformed into (6.1, 6.2 show surface view). 7.9 Two weeks after infection for ascriss of prantenic

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#### 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.







































# **Acquired immunity**





# **Order Strigiformes**

d. Dioecy1. 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









