# Schistosomatidae

<table>
<thead>
<tr>
<th></th>
<th><em>S. mansoni</em></th>
<th><em>S. Mekongi</em></th>
<th><em>S. Japonicum</em></th>
<th><em>S. hoematobium</em></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dist.</strong></td>
<td>N. Africa and South America</td>
<td>Vietnam Mekong Laos</td>
<td>Japan and SE Asia</td>
<td>Africa</td>
</tr>
<tr>
<td><strong>Snail</strong></td>
<td><em>Biomphalariae</em></td>
<td><em>Onchomelania</em></td>
<td><em>Bulinus physopsis</em></td>
<td></td>
</tr>
<tr>
<td><strong>Location</strong></td>
<td>Lg. Intestine and veins around small intestine</td>
<td>Intestine</td>
<td>Small intestine, large intestine usually</td>
<td>Bladder (usually) urine</td>
</tr>
</tbody>
</table>

Eggs come out in the bloodstream → work through tissue of blood vessels → into muscularis mucosa of intestine → lumen of intestine → out with feces

- Low grade infection in Puerto Rico (.5% - 1% of people in fields). Schistosoma cases will increase in the next 2-5 years because of the unsanitary conditions there due to hurricanes.
- Snail in Brazil that is a good host is Tropicornus (spelling?)
- *S. Mansoni* – big spine on egg
- *S. hoematobium* – terminal spine
- *S. Jamonicum* – little, tiny spine (hard to see)
- Frog on face: *Eilaria* (spelling?) larvae inside go into eye

## Diagnosis
- Stool sample/urine sample
- Liver biopsy/imunological test
- Questions about frog on face. Don’t eat things for dares or put frogs on your face

Astor (pacific northwest) 1920 – reports of people who gave salmon to their dogs → dogs died

- *Nanophyetes salmincola*
  - Have Rickettesia
  - Female dog lactins protect babies
Carnivore → eggs → snail → redia (mother, daughter) → cercaria → cercaria
penetrate salmonid fish

Tapeworms
Phylum: Platyhelminthes
Class: Cestoda

- Order – cyclophyllidea
- Family: Taenidae
  - Taenia spp – all use a carnivore as definitive host, herbivore as intermediate host.
    - Up to 25 meters long inside the intestine
    - T. solium – humans as definitive host. Pig intermediate
    - T. saginata – humans as definitive host. Cow intermediate
    - T. asiatica – humans as definitive host. Yak intermediate
  - Echinococcus -
  - Versteria spp -

Sharks have never undergone a massive extinction. Tapeworms in sharks have had time to diversify.

Taenidae

- P. Platyhelminthes
- C. Cestoda
- F. Hymenolepididae:
  - Hymenolepis diminuta
    - Head end: scolex, suckers. No mouth, they are Platyhelminthes so they don’t have a complete digestive system.
      - Tegument – microvilli to increase surface area of the tapeworm.
Apical organ: In place of rostellum. No hooks.

Uses a cycle with rats to beetles. Easily understood for study

- Some can occur in birds, bats, and people
- Humans get infected by eating beetles

- 3 testes per proglottid
- Protandrous

- Protandrous – testes develop first
- Protogynous – ovaries develop first
  - Ootype is where the egg shell is formed → uterus → embryo develops

- Isthmus of Panama
  - Suckers go into pockets

- Mexico – volcanic area, Irazu
  - *Lex irazuensis*

Hooks on rostellum have handle, guard, and blade

- Can lost hooks be regenerated?

- Taenia – 40 species

  - Life cycle of taenia solium vs taenia saginata

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**Taenia**

- *O. Cyclophyllidea*
  - *F. Taeniidae*
    - G. Taenia – 40 species or more
    - *T. saginata*
    - *T. solium*
- **T. asiatica**
  - Life Cycle: *Taenia saginata*; no rostellum or hooks, more than 13 lateral branches of the uterus
    - People poop out eggs and gravid proglottids (apolytic: segment comes off and crawls around)
    - Cattle ingest grass and feces, oncospheres inside cow
    - Onchospheres travel to intestine of cattle and circulate to muscle
    - Onchosphere develops into cystercerci (invaginated scolex)
    - Human ingests infected beef (**humans are definitive host**)
    - Scolex exvaginates, travels to intestine and hooks on with suckers
    - Adults develop in small intestine
  - Blade, guard, and handle on egg hooks
  - Life Cycle: *Taenia solium*; fewer than 13 lateral branches of the uterus
    - Same as *saginata*, but pigs are the intermediate hosts.
    - **Human does not have to be immunocompromised for this to take place**
    - One of the worst ones – easy to die from
  - Life Cycle: *Taenia asiatica*
    - Same as *saginata*, but yaks are the intermediate hosts
    - Common ancestor with *saginata*
  - If you’re infected with *Taenia*, don’t defecate in feed lots.
  - Segment Drawing:
    - *Hymenolepis* do not have rostellum or hooks. Species *nana* does not exist in this genus
- **Echinococcus**
  - Really small. Usually 3-4 segments; 8mm long maximum. Rostellum with hooks on the scolex.
    - 10-15 species
    - *E. granulosus*
    - *E. multilocularis*
    - *E. asiatica*
- *E. felidis*
- *E. oligarthus*
- *E. vogeli*