

Trematode & Cestode Appendix

(Supplemental Material that will NOT be on Exams)

Lectures #26 & #27: TREMATODES

Paramphistomum cervi

- A. Morphology
 - Thick, oval, rumen flukes. Posterior Ventral Sucker Testes lobed, tandem & anterior to the Ovary
- B. Life Cycle
 - Cattle, Sheep, Goats. Various aquatic snails (pond /puddle). Aquatic or Semi-aquatic Vegetation. Marita or Young Flukes
 - Young flukes feed & migrate through duodenum before arriving in the rumen and maturing.
 - Prepatent period: 3-5 months
- C. Geographic Distribution. Scattered throughout US. Other species found in Gulf Coast states (Florida & Louisiana)
- D. Pathology
 - 1. Due to Immature flukes feeding & migrations through duodenum
 - Hemorrhagic duodenitis, catarrhal and hemorrhagic inflammation, anemia, hypoproteinemia, edema, emaciation
 - 2. Due to mature flukes in rumen
 - Negligible pathology
- E. Diagnosis
 - 1. During pathology : Profuse, fetid, fluid diarrhea, Young flukes in feces, Marked weakness, Necropsy, (No ova, as immature flukes cause pathology)
 - 2. After Pathology (adult flukes): Fecal sedimentation for ova
 - 3. Swampy or wet pastures.
- F. Treatment
 - 1. No good treatment in US: Clorsulon --> ineffective
 - 2. Treatments available in Europe: Hexachlorophene, Oxyclozanide
- G. Control
 - 1. Snail Control: Molluscicides, Adequate drainage of pastures
 - 2. Grazing Control: Restrict access to wet areas
- H. Zoonosis: NONE

Alaria sp.

- A. Morphology: Small spoon-shaped intestinal flukes, with forebody & hindbody. Ventral sucker small and anterior to tribocytic organ. Ovary anterior to tandem oval testis in hindbody.
- B. Definitive Hosts & Distribution
 - 1. Dogs, Cats, Fox, Wild felids, Mink: Uncommon in North Carolina
 - *Alaria canis* ==> Northern United States
 - *Alaria marciana* ==> Southern United States
- C. Life cycle: Variety of paratenic hosts (Frogs, snakes, etc.)
 - 1. *Alaria marciana* ==> Transmammary Transmission
- D. Pathology
 - 1. Adults ==> minor pathology
 - 2. Migrating Mesocercariae ==> Lung Pathology
- E. Diagnosis: Respiratory difficulties
- F. Treatment ---- Albendazole or Praziquantel
- G. Control ---- Restrict outdoor access

Other Schistosomes

Schistosoma sp.

1. Human blood flukes one of 6 major human parasitic diseases
2. Occurs in tropical parts of the world (not in North America)
3. Also a Bovine Blood fluke.

Bird Schistosomes (*Trichobilharzia sp.*, *Gigantobilharzia sp.*, etc.)

1. Causes "Swimmer's Itch"
 - Important in Great Lakes and other areas where migratory birds congregate

Lectures #28 & #29: CESTODES

Taenia ovis -- Canid definitive hosts. Sheep carrying the larval stages (*Cysticercus ovis*) may have extensive pathology of the skeletal and cardiac muscles; the disease is referred to as cysticercosis. This is sometimes a problem with imported mutton from Australia. A vaccine is available for sheep.

Taenia hydatigena -- Canid definitive hosts. Ruminants are infected with the larval stages (also known as *Cysticercus tenuicollis*). Migration of the larvae cause acute traumatic hepatitis; necrotic tissue predisposes to opportunistic bacterial infections i.e. "black disease" due to *Clostridium*. Economic losses result from condemnation of livers. Adult tapeworms in the intestines of dogs cause minimal damage.

Taenia multiceps -- Canid definitive hosts. The larval stage in sheep is a COENURUS (*Coenurus cerebralis*) with many scolices, each scolex having the potential to develop into an adult within the definitive host. These larvae can also be found in the brains of cattle and cats. Clinical signs in sheep include blindness, incoordination, circling, and head pressing. Dogs are typically infected by ingestion of infected sheep brains. Eggs in dog feces contaminate the grazing pastures.

Echinococcus multilocularis -- Important medical tapeworm.

- Definitive hosts include the fox, dog and cat.
- In the intermediate host (rodents, cattle, horses, swine, occasionally **man**), the multilocular, alveolar cyst buds and proliferates into surrounding tissue like an infiltrative tumor. Difficult to remove via surgery. Can be fatal with time.
- Prevalent in the arctic regions; is spreading southwards into the U.S. because of the downward migration of the fox.
- An ELISA test from the Centers for Disease Control allows the distinction of *E. granulosus* from *E. multilocularis*

Anoplocephala magna --- equine tapeworm --- found in the small intestine and can be up to 80 cm in length. Generally non pathogenic, unless in large numbers.

Diphyllobothrium latum ("broad fish tapeworm")

1. The first intermediate host is a small crustacean and the second intermediate host is a small fish e.g. minnow. The fish may be eaten by a predatory fish that serves as a paratenic host, e.g. pike.
2. The definitive host (e.g. dog, man) is infected by ingestion of undercooked fish.
3. Occasionally causes Vitamin B12 deficiency that leads to anemia
4. Infection is most often seen in the Great Lakes region

END of Trematode & Cestode Appendix
