Order Spirurida - general features

- Who is in this Order?
  - *Dracunculus insignus* – subcutaneous.
  - *Physaloptera* - stomach worm of dogs, cats.
  - *Habronema* & *Drashia* - found in stomach of horses.
  - *Onchocerca* - found in ligaments of horses.
  - *Dipetalonema* - subcutaneous in dogs.
  - *Dirofilaria* - dog heartworm.
Order Spirurida - general features

- **Require** arthropods as intermediate host.
- Routes of infection:
  1. *ingestion* of arthropod, or ingestion of a paratenic host that ate the infected arthropod.
  2. infective larvae delivered to host when arthropod feeds on the host.
Order Spirurida

- *Dracunculus insignus* – occurs in North Carolina in dogs, raccoon reservoir (also, reported in 2 cats)
Spirurida

- *Dracunculus insignus* life cycle: adult female opens skin lesion to release L₁ that are eaten by copepod intermediate host. Copepod or paratenic host frog eaten by raccoon/dog. Prepatent time in dog = 300-400 days.
Physaloptera sp.

- Thick-bodied up to 40 mm long with anterior collar, don’t confuse with *Toxocara* or *Toxascaris*. Adults in stomach of raccoons (reservoir host), dogs and cats.
Physaloptera sp.

- Beetles are the intermediate hosts, but rodents can be paratenic hosts.
- Pathogenesis: gastritis, bleeding, ulcers.
Physaloptera sp.

- Diagnosis: difficult due to few and hard to float eggs. Vomited worm - don’t assume it is Toxocara. Endoscopic exam.

- Treatment: Pyrantel at 20mg/kg, repeated if vomiting persists. Other anthelmintics effective as well.
Habronema and Drashia

- Up to 20 mm long, thicker than *Trichostrongylus axei*, found in the stomach of horses.
**Habronema and Drashia**

- larvated egg, passed in feces, hatches and $L_1$ ingested by maggot of fly, $L_3$ deposited on horse by fly when feeding around lips, eye or wounds.
Habronema and Drashia

- Pathogenesis:
  1. Internal - gastritis and ulcers from *Habronema* adults, fibrous “tumors” in stomach wall containing adult *Drashia*.
Habronema and Drashia

2. External - cutaneous habronemiasis occurs when larval stages remain in skin and cause eosinophil/ granulomatous lesion.
Habronema and Drashia
Habronema and Drashia

• Diagnosis: anorexia and cutaneous lesions, response to anthelmintics.

• Treatment and control:
  1. Systemic fenbendazole or ivermectin, also topical application.
  2. Compost manure and fly control if indoors. Repellant on abrasions.
Dipetalonema (Acanthocheilonema)

- Adults in subcutaneous tissue cause no signs, but microfilariae in blood can be confused with *Dirofilaria immitis.*
Onchocerca sp.

- Species in horses very common before ivermectin, now see in horses under minimal management.
- Adult worm in ligaments of neck cause no pathology there.
- Microfilariae produced by adults congregate in skin of ventral abdomen where *Culicoides* (midge) bite.
**Onchocerca sp.**

- **Pathogenesis:** summer sores develop on ventral abdomen, microfilariae found in skin snip.
- **Treatment:** systemic ivermectin clears skin lesions. May precipitate transient edema.
Dirofilaria immitis

- Read American Heartworm Society Guidelines for Dogs.
- Read American Heartworm Society Guidelines for Cats.
- Come ready to discuss in class Monday, October 26th.
- These Guidelines are published “Best Practice Guidelines” viewed by your clients
- http://heartwormsociety.org