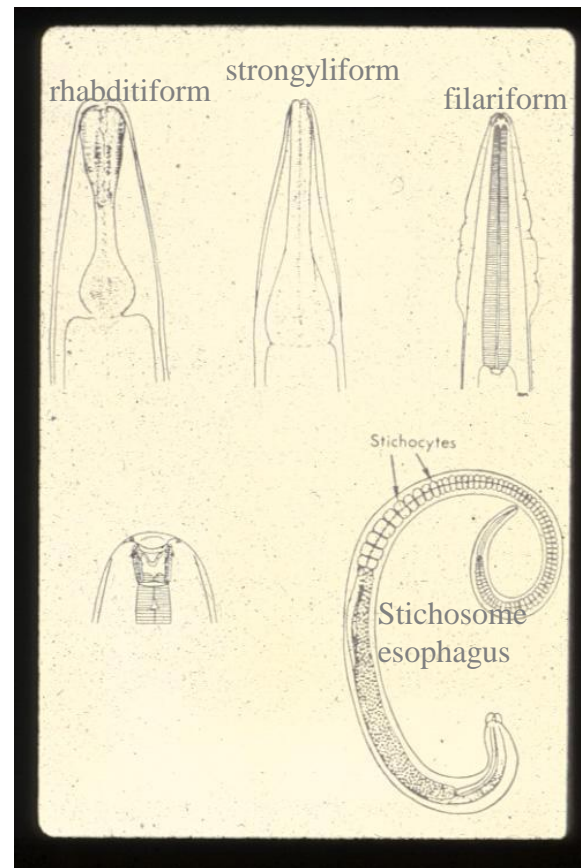


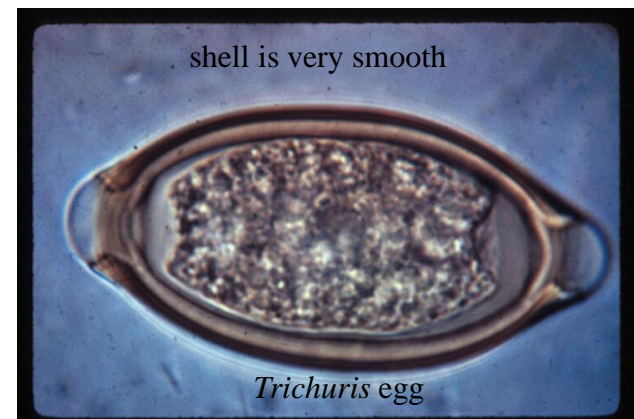
Order Enoplida

- Three important genera: all have the stichosome esophagus
Trichinella spiralis
Trichuris
Capillaria
(*Eucoleus*)



Order Enoplida

- Trichinelloidea genera and *Dioctophyme* have eggs with bipolar plugs. Also *Syngamus trachea* in birds.
- *Capillaria* above
- *Trichuris* below
- *Trichinella* does not produce eggs

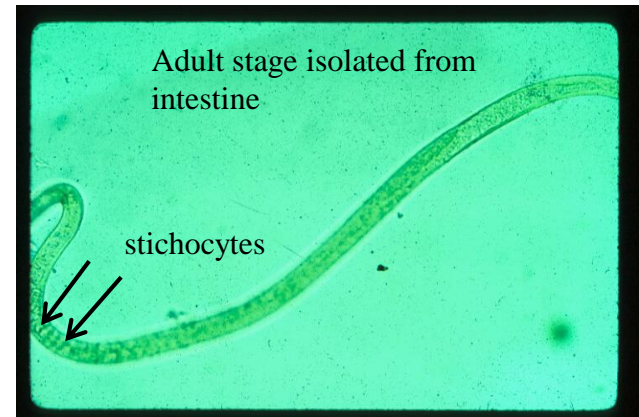
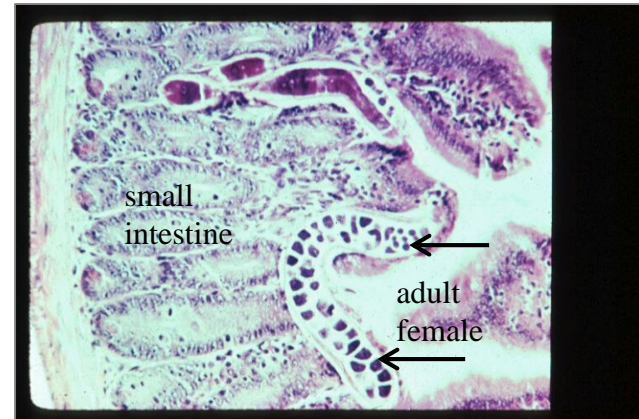


Trichinella spiralis

- The same species infects all warm-blooded animals and causes a zoonotic disease of major public health concern
- where pigs are raised outside and pork is not cooked well or frozen
- when omnivore/carnivore game species are eaten without thorough cooking

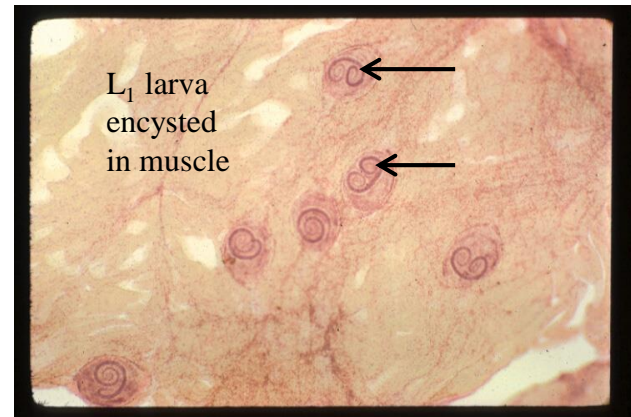
Trichinella spiralis

- Tiny adults are found in the mucosa of the small intestine.



Trichinella spiralis

- Larvae produced by the females are distributed to the host muscle tissue of the same host where they remain until eaten by the next host.
- Consequences?
Discuss. What is the risk of humans getting infected from eating undercooked beef?



Trichinella spiralis (cont.)

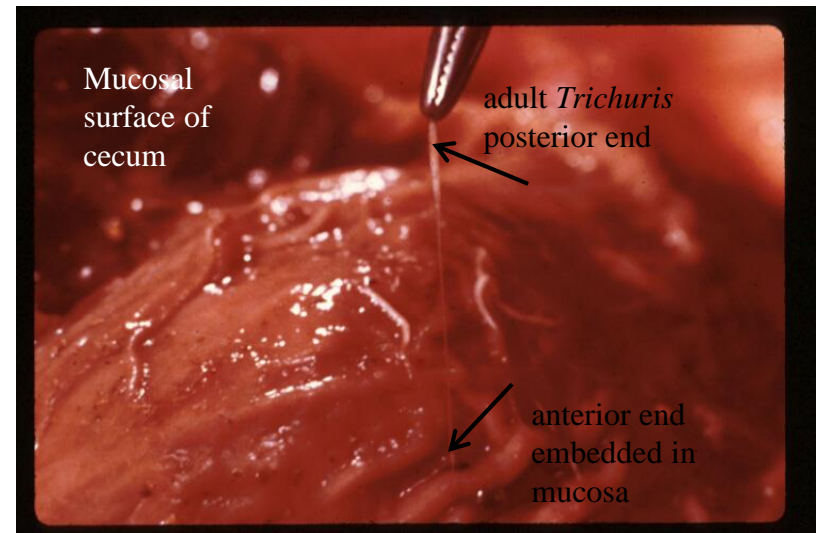
- Clinical disease seen in humans, rarely in other species.
- Signs of transient enteritis early after infection, then larvae cause myositis and possibly muscle paralysis in heavy infections.
- Diagnosis: clinical signs shortly after eating raw or under-cooked meat.
Antibody titers.

Trichinella spiralis (cont.)

- Do not eat raw or rare meat! Even horse meat may contain *Trichinella*. How?
- Do not feed uncooked garbage to pigs.
- Rodent control to prevent pigs eating “ratburgers”.
- Treatment: benzimidazoles and pyrantel.

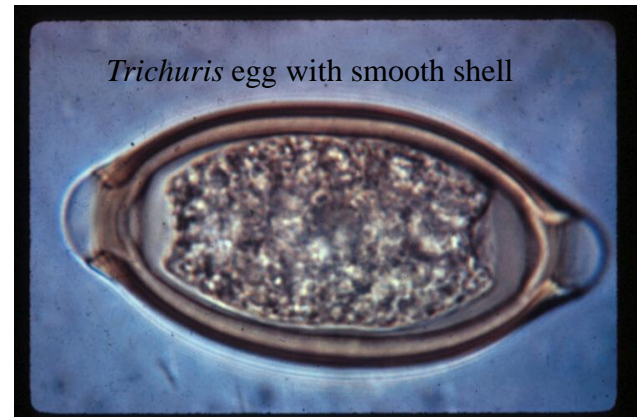
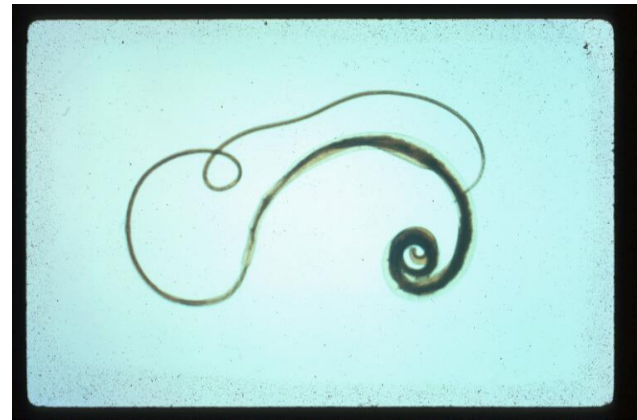
Trichuris sp.

- Adults found in the tip of the cecum and large intestine. Unlike *Trichinella*, *Trichuris* is very species specific.
- *Trichuris suis* used as treatment for humans to reduce allergic inflammation



Trichuris sp.

- Long thin (hair-like) anterior end and thicker posterior 1/3 (big butt).
- Females produce double operculated, bipolar eggs characteristic of the Order, including *Capillaria*.



Trichuris (cont.)

- Egg containing infective larva must be ingested. Route of infection = fecal/oral. But eggs require 3 weeks to become infective. Prepatent time in dogs is 12 weeks. Pigs = 6 weeks.

Trichuris (cont.)

- Clinical signs seen mostly in dogs (*T. vulpis*) and pigs (*T. suis*). Characteristic of colitis, often hemorrhagic.
- Pathology due to bacteria invading mucosa compromised by *Trichuris*



Trichuris (cont.)

- Diagnosis and Control is problematic.
 - long prepatent time with larval stages that are not easily killed by most drugs.
 - adult females are sporadic egg producers, thus diagnosis by fecal exam is difficult.
 - eggs are highly resistant and larvae inside are long-lived like ascarid eggs.
 - change environment and repeat treatments for the length of the prepatent time at least.
 - shorten heartworm monthly prophylaxis to three week interval (milbemycin containing products work best for this)

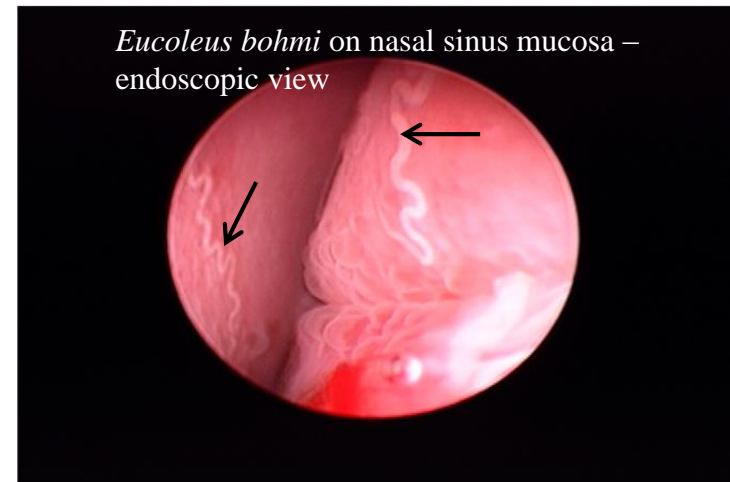
Capillaria sp. (Eucoleus)

- A multitude of species that are site specific and somewhat host specific. All have a stichosome esophagus and are hair-like. Females produce bipolar eggs that must be differentiated from *Trichuris* eggs.



Capillaria sp. (Eucoleus)

- Nasal sinuses and airways of dogs and cats. Differential diagnosis with allergic rhinitis important for correct treatment (corticosteroid vs anthelmintic)
- Urinary bladder of dogs and cats.
- Digestive tract of birds.



Capillaria sp. (*Eucoleus*) FYI not on test

- Treatment of companion animals: fenbendazole (Panacur) at very high doses for 1-2 weeks, or ivermectin (0.2mg/ml).
- Pyrantel tartrate as continuous medication in feed is used to kill larvae emerging from eggs, as with ascarids and *Trichuris*, used for production animals.

Urbanized Raccoons as Sources of Helminth Infection to Dogs

- *Macracanthorhynchus ingens* (thorny headed worm)
- *Heterobilharzia americana* (blood fluke)
- *Dracunculus insignis* (related to human guinea worm)
- *Physaloptera* (stomach worm of dogs and cats)
- *Baylisascaris procyonis* (raccoon ascarid)