



Zoonotic Parasitic Infections

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Baylisascaris procyonis

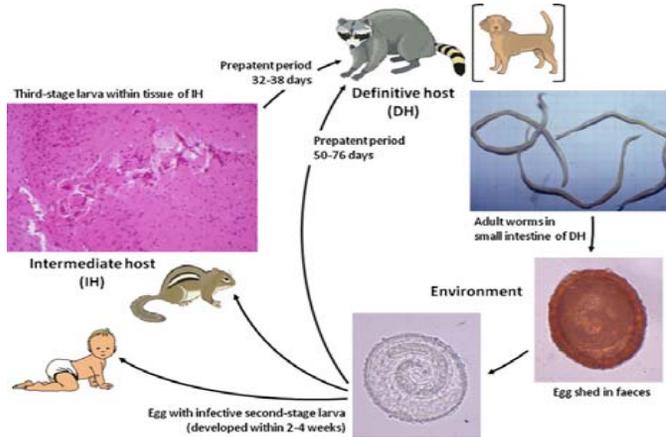


Figure 2. *Baylisascaris procyonis* life cycle².

The raccoon ascarid is a major zoonotic risk that can infect humans and domestic species resulting in significant disease.

- In raccoons, larvae hatch and penetrate the intestinal mucosa, where they grow and mature
- Infections in the definitive host are generally asymptomatic, though high worm burdens may occasionally cause intestinal obstruction and death
- Eggs are shed in the feces 50-76 days after infection; ingested from contaminated soil
- In intermediate/aberrant hosts, larvae hatch and migrate randomly throughout the body as they grow, causing considerable tissue damage that results in visceral and neural larval migrans
- Liver, lungs, CNS commonly affected
- When larvae enter the brain, prolonged migration causes extensive neural damage



Figure 1. A. Larvated and non-larvated infective ascarid eggs ¹ B. Cross section of an adult nematode (buzzle.com). C. Larva of *B. procyonis* hatching from an egg ⁸ D. *B. procyonis* larvae in cross section, rabbit cerebrum (aapredbook.aapublications.org)

- Visceral or ocular larval migrans has been reported in children and adults
- Most prevalent in urban/suburban areas of North America where raccoons live in close proximity to humans
- Consumption of infected soil the most likely route of infection¹
- Treatment is rarely successful; prevent by avoiding contact with raccoon feces
- Baiting raccoons with anthelmintic-medicated feed can reduce prevalence in the wild²

Echinococcus granulosus

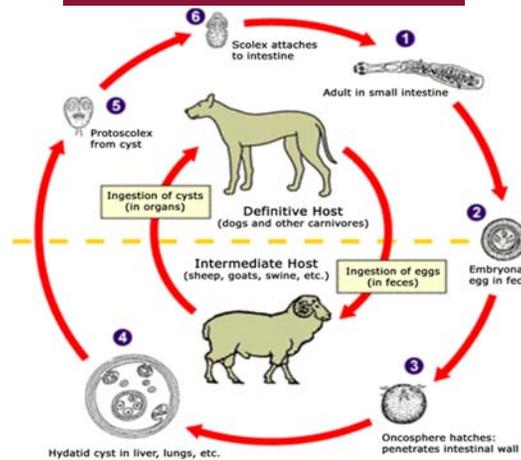


Figure 3. *Echinococcus granulosus* life cycle (<http://www.dpd.cdc.gov/dpdx/html/Echinococcus.htm>).

The canine tapeworm is a cestode that can cause hydatid cyst disease in humans.⁴

- In dogs, larvae hatch and penetrate the intestinal mucosa, where they grow and mature
- Infected dogs are usually asymptomatic, and younger dogs are more susceptible to infection
- Humans are infected by ingestion of eggs/proglottids from the environment
- Infection in humans results in damaging cyst development in the lungs or liver as the larvae mature and enlarge³

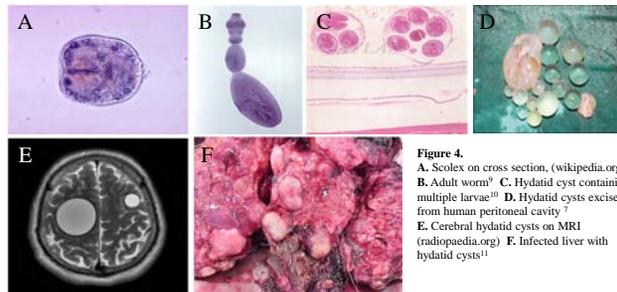


Figure 4. A. Scolex on cross section, (wikipedia.org) B. Adult worm⁹ C. Hydatid cyst containing multiple larvae¹⁰ D. Hydatid cysts excised from human peritoneal cavity⁷ E. Cerebral hydatid cysts on MRI (radiopaedia.org) F. Infected liver with hydatid cysts¹¹

- Prevalent worldwide, especially in developing regions
- Cystic infection is persistent in rural areas where livestock act as intermediate hosts³
- People living in close proximity to dogs fed on raw livestock offal are at high risk of infection
- Prevention is achieved by restraining dogs and limiting their access to raw meat or wildlife³

Ancylostoma caninum

The canine hookworm is a nematode that can cause cutaneous larval migrans in humans.⁵

- In dogs, worms penetrate the skin, migrate through tissues (via lymphatics and venous system) to the lungs, are coughed up and swallowed, and grow and mature in the small intestine⁷
- Larvae may migrate to other tissues such as mammary glands, so puppies can be infected through nursing⁶
- Infection is by egg ingestion or larval penetration of the skin
- In humans, larvae are unable to complete their normal life cycle, therefore they migrate throughout the epidermis causing tissue damage and irritation⁷
- Infection can be successfully treated with albendazole or ivermectin in humans⁶

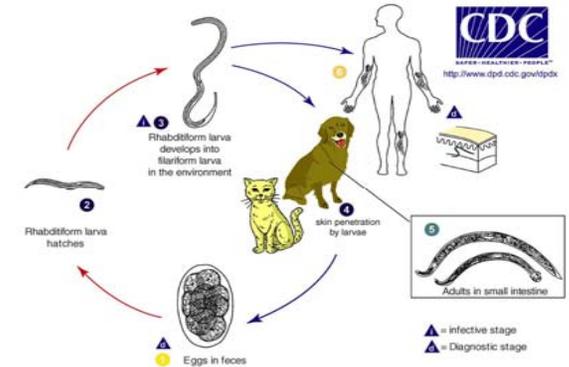


Figure 5. *Ancylostoma caninum* life cycle.

- Transmission in humans is via skin contact with infected soil or other fomites⁷
- Infection is most common in the developing world⁵
- Larvae are able to penetrate skin and migrate through other tissues
- Adult worms in the intestines cause severe eosinophilic enteritis and infiltration of the bowel wall⁶

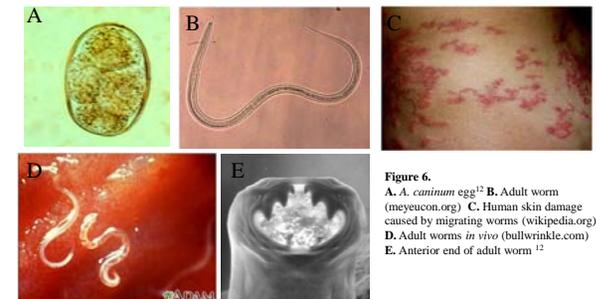


Figure 6. A. *A. caninum* egg¹² B. Adult worm (meyercoxon.org) C. Human skin damage caused by migrating worms (wikipedia.org) D. Adult worms in vivo (bullwinkle.com) E. Anterior end of adult worm¹²

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