



Tikrit University
College of Veterinary Medicine

Nematoda

Subject name: Parasites

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Lecturers link

SCAN ME

Hookworms

Family: Ancylostomatidae

Ancylostoma duodenale

Along with its range of definitive hosts, *Ancylostoma duodenale* also has a range of paratenic hosts of canids and felids, where it may remain for intervals of time until it reaches the definitive host.

In the paratenic host it may survive in the muscles where it is then transferred to humans via undercooked meat, including rabbit, lamb, beef, and pork. The eggs of *Ancylostoma duodenale* are still within the muscle and are ingested with the meat, allowing for the adults to develop within the intestinal tract.

Main properties

Ancylostoma duodenale is an S-shaped worm because of its flexure at the frontal end. The worm is pinkish-white. Adult male hookworms range in size from 8-11 mm long, whereas adult females range in size from 10-13 mm long. This species is dimorphic, with the males having bursa characteristics and needle-like spicules with small tips, which are distally fused. Females have a vulva located approximately one-third of the body length from the posterior end.

Both male and female hookworms have two powerful ventral teeth in the adult forms of the parasite, one along each side of the buccal capsule; smaller pairs of teeth are located deeper in the capsule.

Hookworm eggs have a thin shell and the larvae possess amphids, large paired sensilla on each side of the mouth, which allow them to locate their host. The larvae are rod-shaped and are about 0.004 cm long.

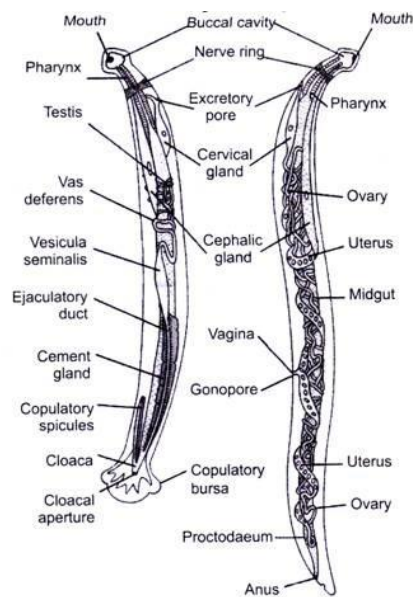


Fig. 9.20 Male and Female *A. duodenale*



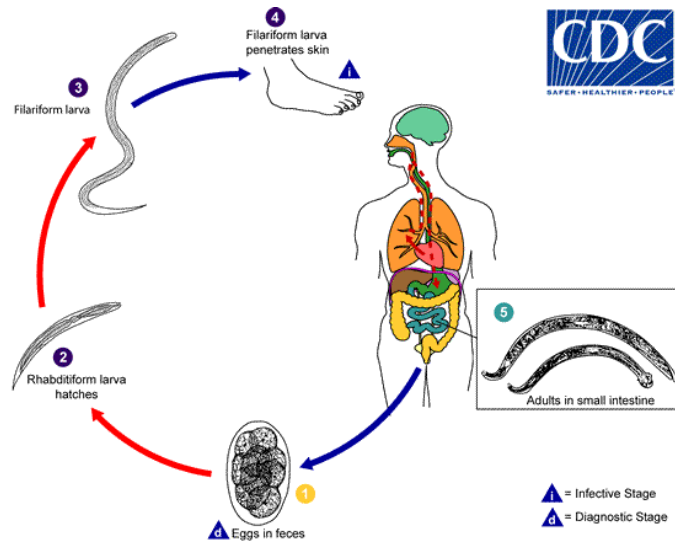
Life cycle

***Eggs** are passed in the stool and under favorable conditions (moisture, warmth, shade), larvae hatch in 1 to 2 days.

*The released **rhabditiform** larvae grow in the feces and/or the soil and after 5 to 10 days (and two molts) they become **filariform** (third-stage) larvae that are infective .

*On contact with the human host, the larvae penetrate the skin and are carried through the blood vessels to the heart and then to the lungs. They penetrate into the pulmonary alveoli, ascend the bronchial tree to the pharynx, and are swallowed .

*The larvae reach the small intestine, where they establish themselves and mature into **adults**. Adult worms live in the lumen of the small intestine, where they attach to the intestinal wall with resultant blood loss by the host .



Pathogenicity and clinical signs

Infected individuals are susceptible to malnutrition, protein and iron drain from the diet. Other effects include stunted growth and below-average intelligence in developing children, lowered antibody response to infectious agents, and anemia due to heavy blood loss and iron-deficiency among other side-effects. In some cases, heavy infestations may lead to fatalities because of infection of other worms or malaria as well as excess blood loss and other types of complications. Infants were recently recognized in the field of public health as being vulnerable. Hookworm disease is more prevalent in females than males.

Ancylostoma caninum

Ancylostoma caninum is a species of nematode known as a hookworm, which principally infects the small intestine of dogs.

Main properties

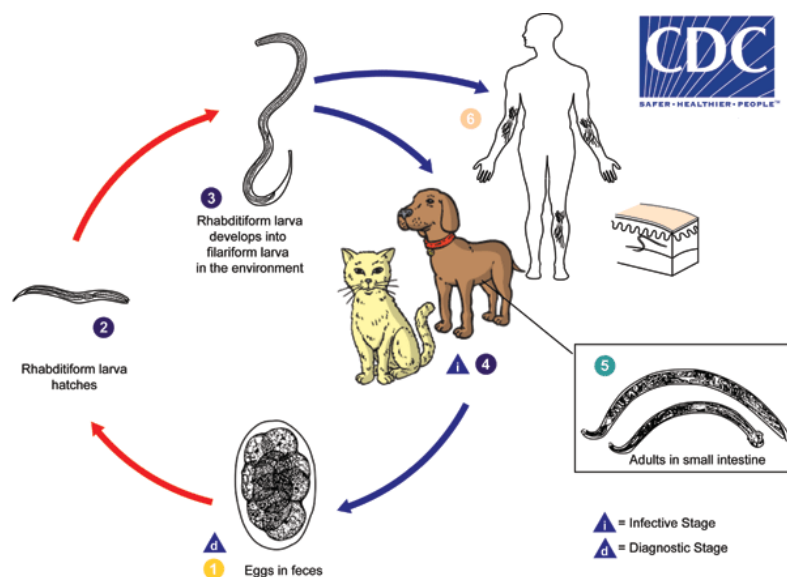
Ancylostoma caninum is usually gray, but appears reddish if there is blood in its alimentary canal. The body is covered by a non-living cuticle that sheds at molts allowing for growth of the nematode. A male is 10 to 12 mm long and 0.36 mm wide; a female is 14 to 20 mm long by 0.5 mm wide and has a pointed tail. The anterior end is bent dorsally so that the

arrangement of the hookworm's ventral and dorsal sides are reversed. In the head of the hookworm is an area called the buccal capsule which contains one the mouth and teeth. Ventrally, there is one pair of teeth, each with three points. In the depth of the capsule there is a pair of triangular dorsal teeth and a pair of ventro-lateral teeth. At its posterior end, a male *A. caninum* has a prominent bursa. The rays inside the bursa are used in identifying species of hookworms, so *A. caninum* has a particular arrangement of rays in its bursa.



Life cycle

* **The eggs** of *Ancylostoma caninum* pass through several larval instars before becoming an adult, he same like *A. duodenal*



Pathogenicity and clinical signs

It is difficult to assess the economic importance of *Ancylostoma caninum* because they do not infect animals raised for food or labor purposes very often.

Domestic dogs, the most common host, can suffer from anemia. If proper precautions are not taken, pet owners with infected dogs can become the host of *Ancylostoma caninum*.

Diagnosis

Tests that can help diagnose the infection include Complete blood count (CBC) with differential and Stool ova and parasites exam .This disease may also affect the results of a D-xylose absorption test.

Treatment

Parasite-killing medications such as albendazole, mebendazole, or pyrantel pamoate are usually prescribed. Ivermectin, used for other worm infections, does not work for hookworm infections.

Cutaneous larval migrans (also known as creeping eruption)

Cutaneous larva migrans is a parasitic skin infection caused by hookworm larvae that usually infest cats, dogs and other animals. Humans can be infected with the larvae by walking barefoot on sandy beaches or contacting moist soft soil that have been contaminated with animal faeces. It is also known as creeping eruption as once infected, the larvae migrate under the skin's surface and cause itchy red lines or tracks.

Clinical signs

- Blisters
- Itching, may be more severe at night
- Raised, snakelike tracks in the skin that may spread over time, usually about 1 cm per day (severe infections may cause several tracks) usually occur on the feet and legs

Possible Complications

- Bacterial skin infections caused by scratching
- Spread of the infection through the bloodstream to the lungs or small intestine (rare)

