

## Ancylostoma

**Phylum:** Aschelminthes

**Class:** Nematoda

**Order:** Strongyloidea

**Genus:** *Ancylostoma*

**Species:** *duodenale*

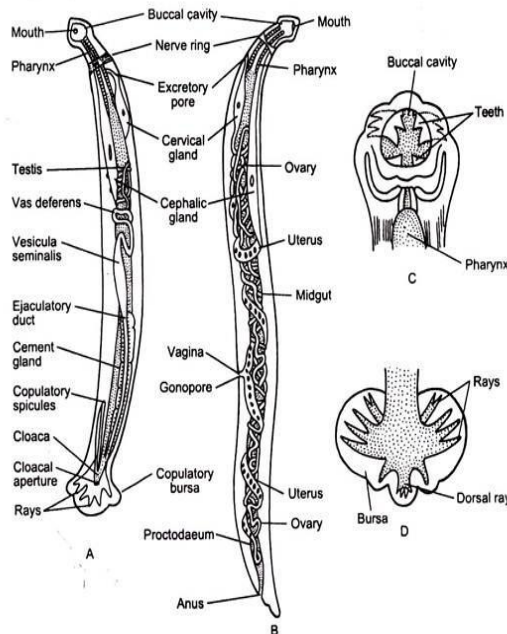


Fig. 15.13: Adult worms of the hookworm, *Ancylostoma duodenale*. A, male, B, Female, C, Mouth region of *Ancylostoma*, D, Posterior end of a male.

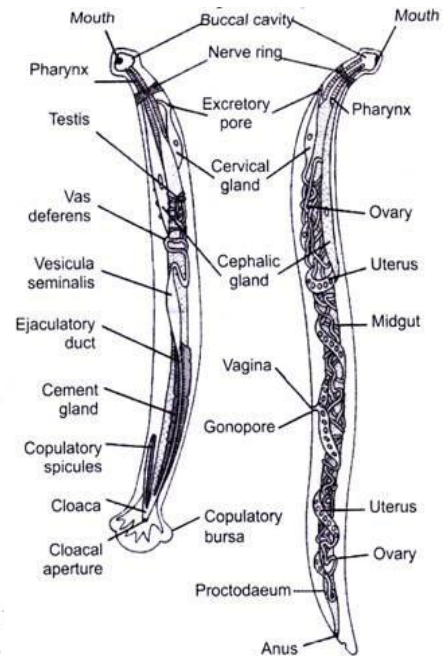


Fig. 9.20 Male and Female *A. duodenale*

*Ancylostoma duodenale* is a parasitic nematode worm and commonly known as the hookworm of human intestine. It exhibits distinct sexual dimorphism i.e. male and female sex are separate. Males are about 8 to 11 mm long and 0.4 to 0.5 mm thick. Females are about 10- 13 mm long, 0.6 mm thick. A terminal mouth is present at the anterior end of the body.

The posterior end is conical and bears a terminal caudal spine in the females. In males, the posterior end is expanded around the cloacal aperture, into an umbrella, like structure, called copulatory bursa. The alimentary canal consists of a large buccal capsule, sucking pharynx, intestine and rectum. The buccal capsule is having sharp cutting teeth. The worm attaches itself and cuts into the intestine of the host by means of its cutting teeth, and then sucks blood.

### **Morphology of *Ancylostoma Duodenale*:**

The detailed structure on morphology of *A. duodenale* (Fig. 15.13) has been discussed by Looss (1905).

### **Adult worms:**

1. The mature worms are cylindrical in shape, plump, rigid and creamy-white in colour (Fig. 15.13).
2. The anterior end is bent dorsally like a hook (hence the name is “hookworm”) and provided with the dorsally placed oral aperture.
3. The oral aperture is provided with 6 sharp teeth (cutting plates) on the ventral aspect, two teeth are found on each side, and two on the dorsal surface.
4. The buccal capsule is large and conspicuous, and is lined with chitin-like substance.
5. The cuticle is with fine transverse striations.
6. A minute finger-like cervical papillae is present on each side, a little away from the anterior extremity.
7. Two cephalic glands, a small oesophageal gland and two pear-shaped cervical glands are connected to the oesophagus, the secretion of the oesophageal gland prevents clotting of the ingested blood.  
  
But Thorson (1956) reported that the oesophageal gland opens near the cutting plates (teeth) in the buccal capsule and participate in the extracorporeal digestion. The function of cervical glands and cephalic glands is not known.
8. Sexual dimorphism is distinct. The female is slightly larger and has a straight and pointed caudal end (Fig. 15.13). The male is characterized by bursa copulatrix (an invagination of the body-wall around the genital aperture) at its caudal end. The bursa is supported by 13 rays. It has two protrusible spicules (1 mm in length) which assist in sperm transfer during the copulation (Fig. 15.13).
9. The female worms measure about 10 to 13 mm x 0.6 mm while the males measure about 8 to 10 mm x 0.5 mm.
10. The female gonopore is separate and is located at the junction of the posterior and in the middle third.
11. The male has a cloaca where the ejaculatory duct opens.

### **Life cycle:**

Hookworm infection begins when the worm is in the larval stage. The infective stage of hookworm is known as filariform larva (fig. 9.21). It penetrates the skin and migrates during its life cycle through the liver and the lungs, and it attaches to the mucosa of the small intestine.

The larva matures into adult in the small intestine, where the female worms may produce several thousand eggs a day. The eggs are released into the faeces and live on soil. Embryonated egg on soil hatch into juvenile 1 stage (rhabditiform or noninfective stage) and mature into filariform larvae. It starts a new reproductive cycle.

The filariform larvae penetrate exposed skin of human host, usually that of the foot by the sweat glands and hair follicles. They invade the lymph and blood vessels, reach the lungs, and pass up the respiratory tract to reach the mouth. In mouth it is swallowed by the host reaches the small intestine. Hookworms deplete the body of nutrients, and a major effect is severe chronic iron-deficiency anemia.

Hookworm infection results into acute anaemia. In children, it retards growth of body and brain. The infection of *Ancylostoma duodenale* can be checked effectively by improving the sanitary conditions to avoid the contamination of faeces with the soil and other edibles, by protecting feet and hands from being touched with the soil. Children should be directed to keep their hands and feet clean.

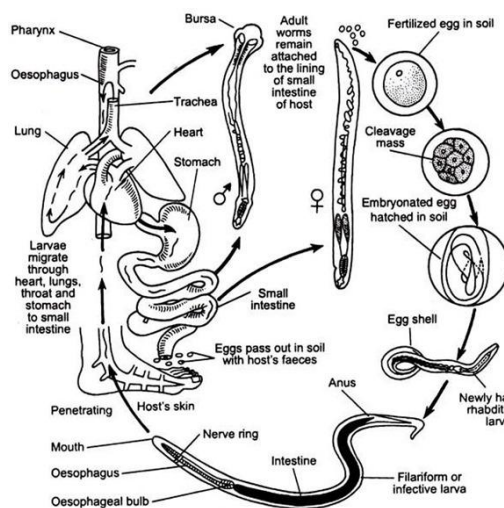


Fig. 15.14: Life cycle of hookworm, *Ancylostoma duodenale*.

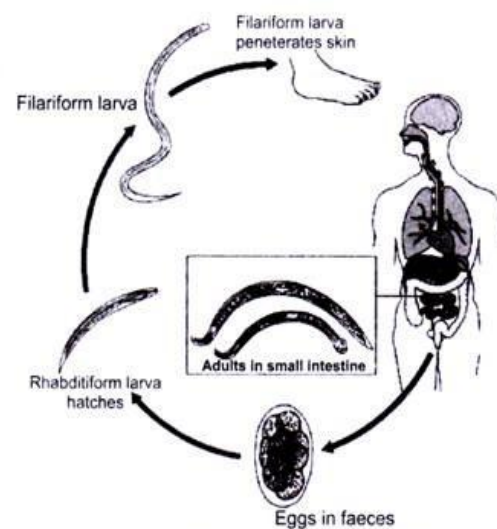


Fig. 9.21 Life Cycle of *A. duodenale*

### Pathogenicity of *Ancylostoma Duodenale*:

The infective larvae cause some kinds of eruption of the skin which may be pustular, known as ground-itch. The hosts infected with adult worms become anaemic as a result of considerable loss of blood from the intestinal wounds.

Besides the anaemic condition, the hosts become susceptible to all diseases, particularly tuberculosis because of the damage done by the larvae during their transit from the heart to the final abode.

**Treatment and Control of Disease Caused by Ancylostoma Duodenale:**

The hookworm infection can be checked by administering tetrachlorethyl, hexylresorcinol, carbon tetrachloride and blephenium, etc.

**Control Measures:**

1. The most important is the sanitary disposal of human faeces to prevent pollution of the earth.
2. Borehole latrine should be introduced in the villages to reduce the spread of larva.
3. Boots and gloves should be weared while working in the garden.

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