

LAB2

Kingdom:Animalia

Phylum :Nematoda

A:Class:Secernentea

1-Order:Strongylata

1-Family:Ancylostomatidae(hook worm)

Genus: Ancylostoma duodenale Old World hookworm

: Necator americanus New World hookworm

2-Order:Ascaridata

1-Family: Ascarididae

Genus: Ascaris lumbricoides

2- Family: Oxuridae

Genus: Enterobius vermicularis

3-Order:Rhabditida

Genus: Strongyloides stercoralis

Phylum: Nematoda

Round worms are classified according to site of infection:

I: Intestinal round worms

II: Tissue round worms

The intestinal round worms are those which:

* Adult worms live in lumen of intestine.

* They include 8 worms of medical importance.

These worms are classified into two classes as follows:

1- Class :Secernentea(Phasmodia)

2- Class : Adenophorea(Aphasmodia)

Class: Phasmodia

1-order: Strongylida : This order has one family with medical importance, it is:

Family: Ancylostomatidae

Ancylostoma duodenale

Common name: Old world hookworm

Disease name: Ancylostomiasis (Tunnel disease)

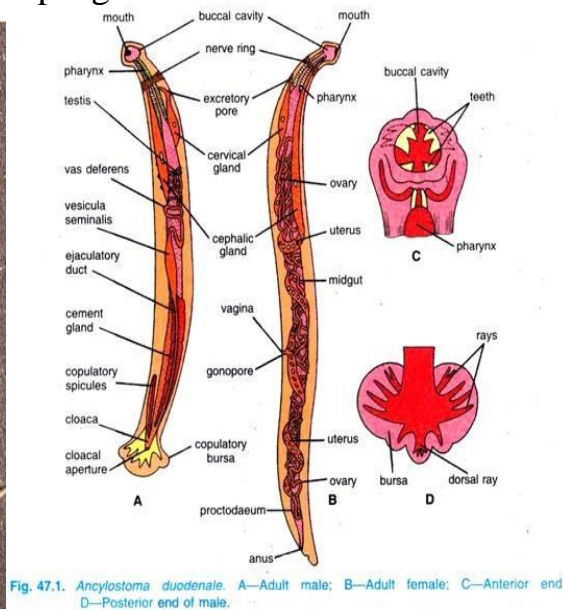
Site of infection: small intestine

Definitive host: human

No intermediate host

Morphology

* The mature *Ancylostoma duodenale* worms are cylindrical and creamy-white in color, Worms have club-shaped esophagus.



buccal cavity bears two hook like teeth on the top and two triangular cutting plates on the bottom, helps in worms feeding by sucking blood.

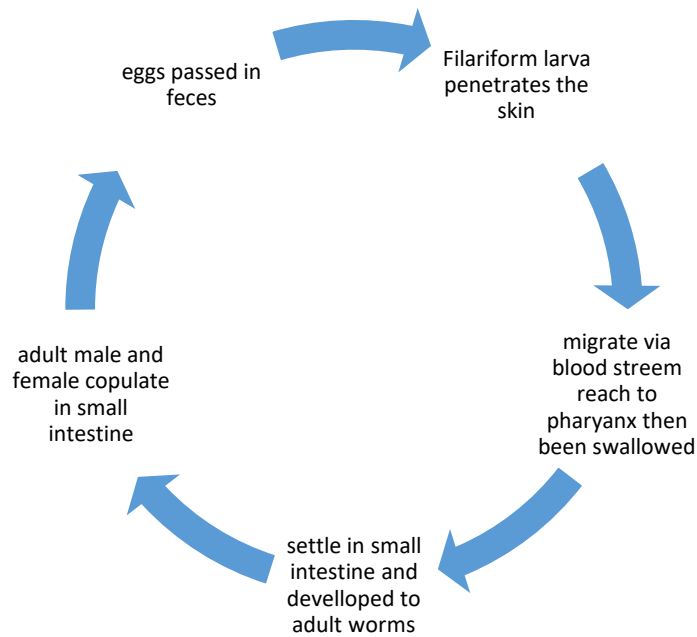
The male posterior end is flattened and equipped with copulatory bursa supported by rays, used to catch and hold the female during mating.

The female is longer than male is an S-shaped worm because of its flexure at the frontal end. The worm is pinkish-white.



*** [Life cycle]**

Man gets infected on ingestion of eggs, or encysted larva in muscles or the filariform larva with vegetables or by penetrating filariform larva of the skin.



Infective stage: Filariform larvae

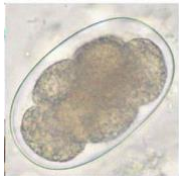
Diagnostic stage: egg

Symptoms:

- * red raised area of the skin ,oedema of the feet and ankles..
- * Loss of blood daily, severe anaemia .

[Diagnosis]

Based on finding the eggs in the feces. (The eggs are oval, colorless, thick-walled).



Necator americanus

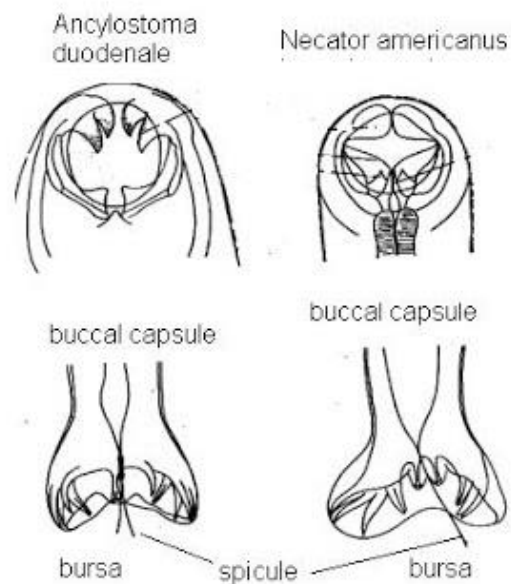
Common name: New world hookworm

Disease name: Necatoriasis

Morphology

Adult worms are slightly smaller than *Ancylostoma duodenale*, the anterior end is curved dorsally giving them their hook appearance

The buccal cavity has four cutting plates, two on the ventral and two on the dorsal surfaces. The bursa is well developed in adult male, the needle





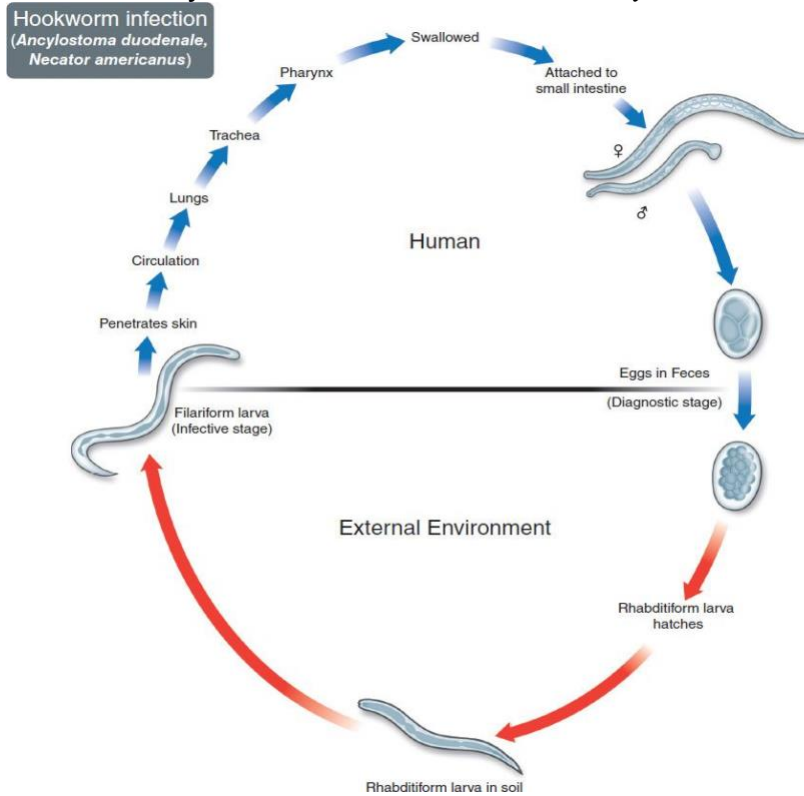
Ancylostoma duodenale copulatory spicules



Necator americanus copulatory spicules

Raed Z. Ahmed, Medical Parasitology Lab., 2012-2013

Their life cycle is similar to that of *Ancylostoma duodenale*.



Symptoms: anemia, malnutrition from protein loss

Laboratory diagnosis: The microscopic examination of stool



2-Order: Ascanidida

1-Family: Ascarididae

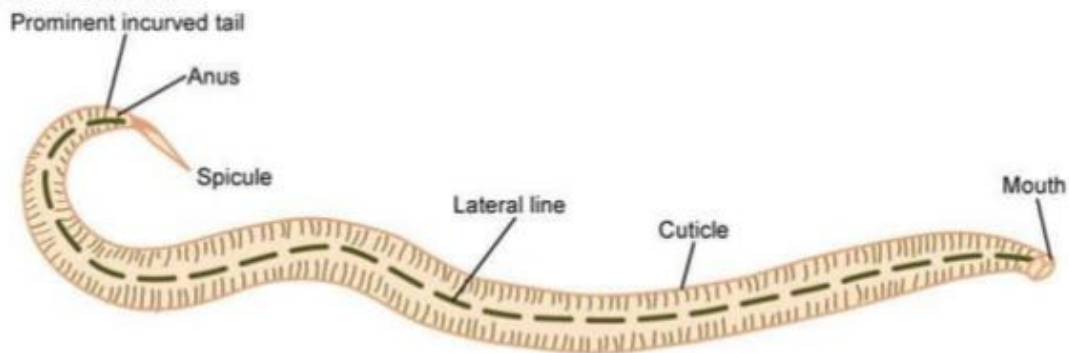
Genus: *Ascaris lumbricoide*

Site of infection: small intestine of man

Morphology:

The worm is the largest of the human intestinal nematodes; it is brownish yellow in color. Mouth with three lips one of the three lips is dorsal and the other two are ventral, The lips have minute teeth, esophagus is a club-shaped. The male is a little smaller than the female. Its posterior extremity is definitely pointed and curved ventrally and provided by equal size of copulatory spicules. The female posterior is straight, the vulva in the middle of the body. Females are oviparous.

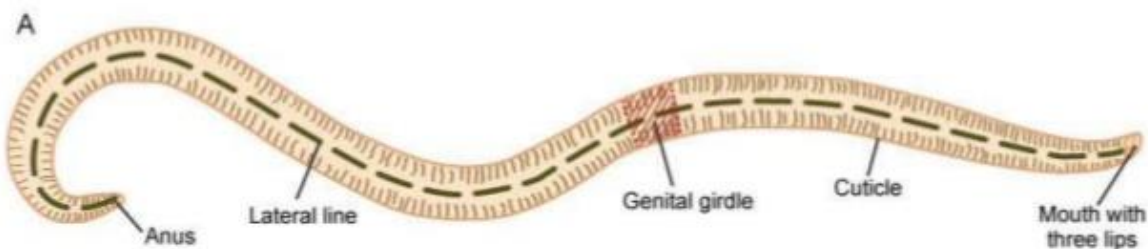
Adult male



Average size: length is seldom up to 30 cm

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Adult female



Average size: 22-35 cm long

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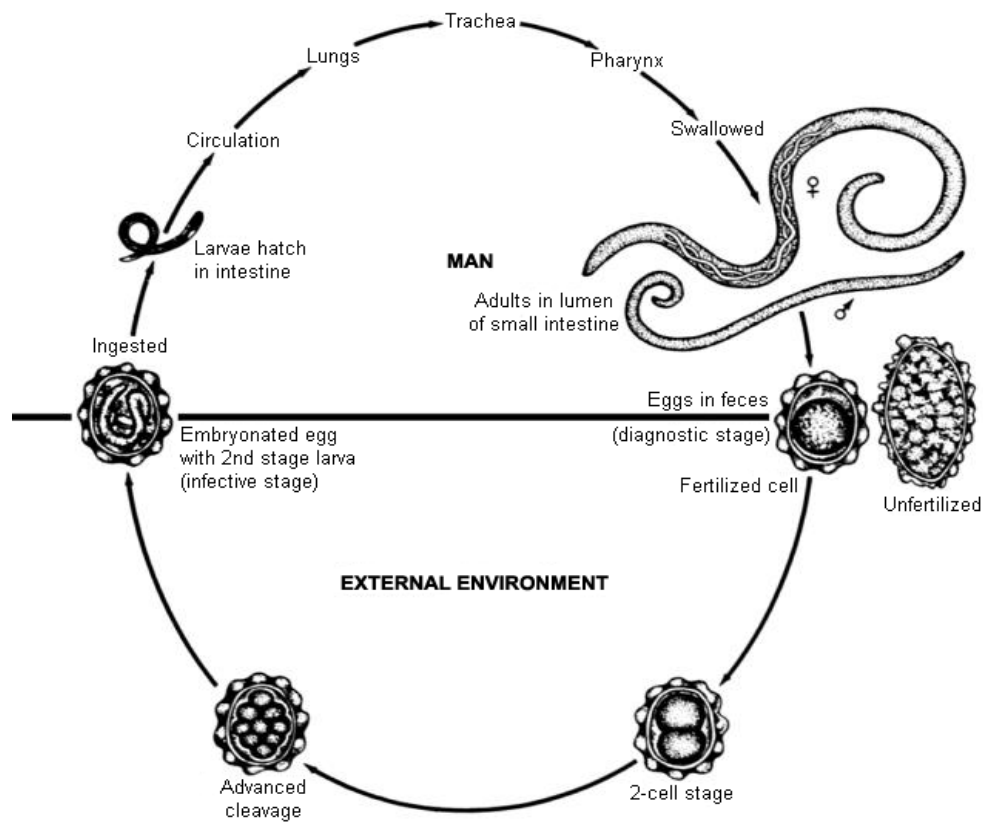
The fertilized eggs are easily recognized, oval in shape with a thick wall. The outer covering has an albuminoid coat, stained golden brown by bile stain.

The unfertilized eggs are longer and narrower than fertilized eggs, having a thinner shell, a smaller albuminoid coat.



Life cycle of *Ascaris lumbricoide*:

- * Eggs in human faeces are not infective to man when passed which are found in soil, water or on green vegetables.
- * Infective stage second larva



Symptoms:

- * intestine obstruction (blockage)
- * vomiting and abdominal pain

- * cough and low grade fever

Diagnosis

Based on the identification of worms passed or on finding eggs in the faces.

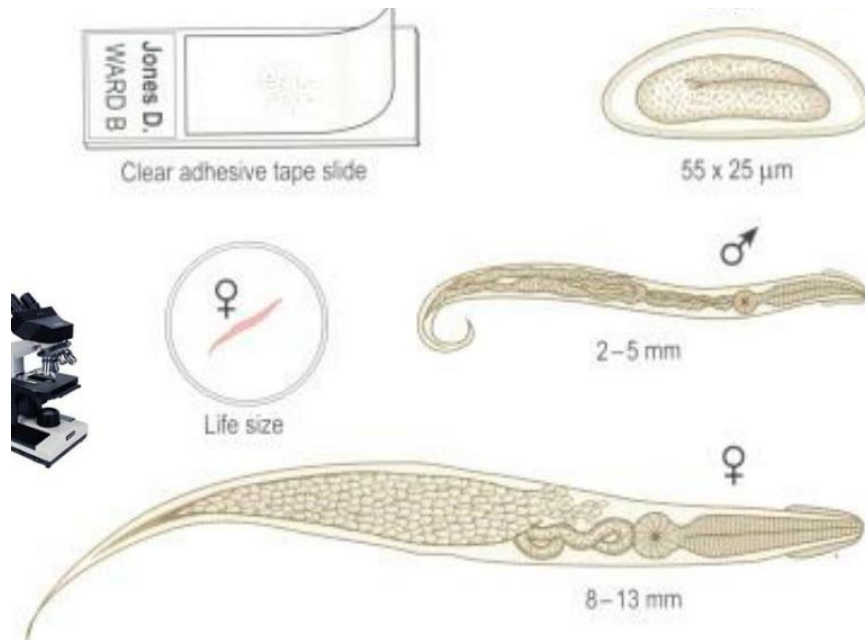
2- Family: Oxuridae

Genus: *Enterobius vermicularis*

- * Common name: Thread-worm or pin worm
- * Site of infection: large intestine and migrate to anal region to lay eggs

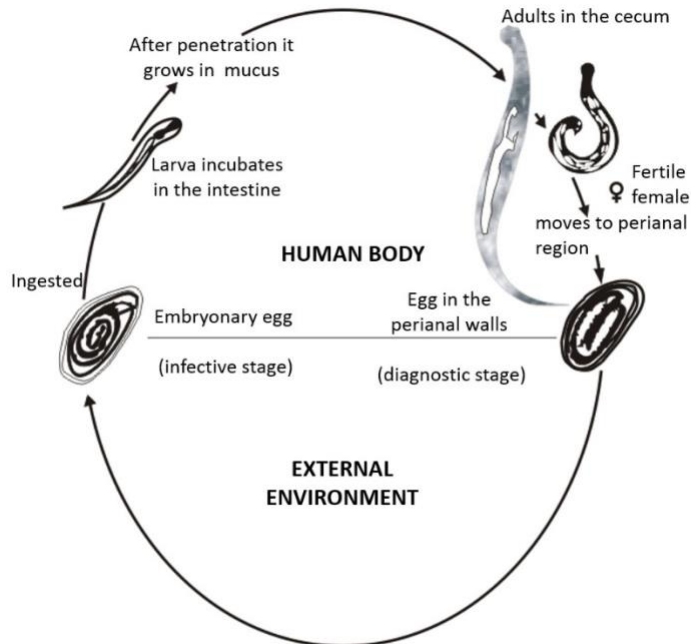
Morphology

- * Have a double-bulbed esophagus.
- * The male is very much smaller than the female, and has a shortened, coiled tail, a single hook like spicule in a spoon shape.
- * The female is much larger than the male. The tail is long, tapering, straight and pointed.
- * The eggs are colorless, one side being a little flattened.



Life cycle:

- * Eggs deposited on the perianal skin.
- * Infective larvae are found in eggs



Enterobius vermicularis Life Cycle, Nematode (Pinworm)

Symptom:

- * fatigue and loss of sleep
- * no-organized urination in children.
- * Adult worms in the intestine may be associated with haemorrhages or inflammation at their site of attachment to the mucosa.
- * The female infection causes inflammation in the reproductive and urinary systems.
- * Sometimes worms are crawling to reach the stomach or oesophagus and nose.

[Diagnosis]

- * The gravid females may be found in the faeces
- * The best diagnostic method is to examine the skin of the buttocks for eggs by means of a anal swap.

3- order: Rhabditida

Worms of this order distinguish by:

This order has one family with medical important, it is:

Family: Rhabditidae

Strongyloides stercoralis

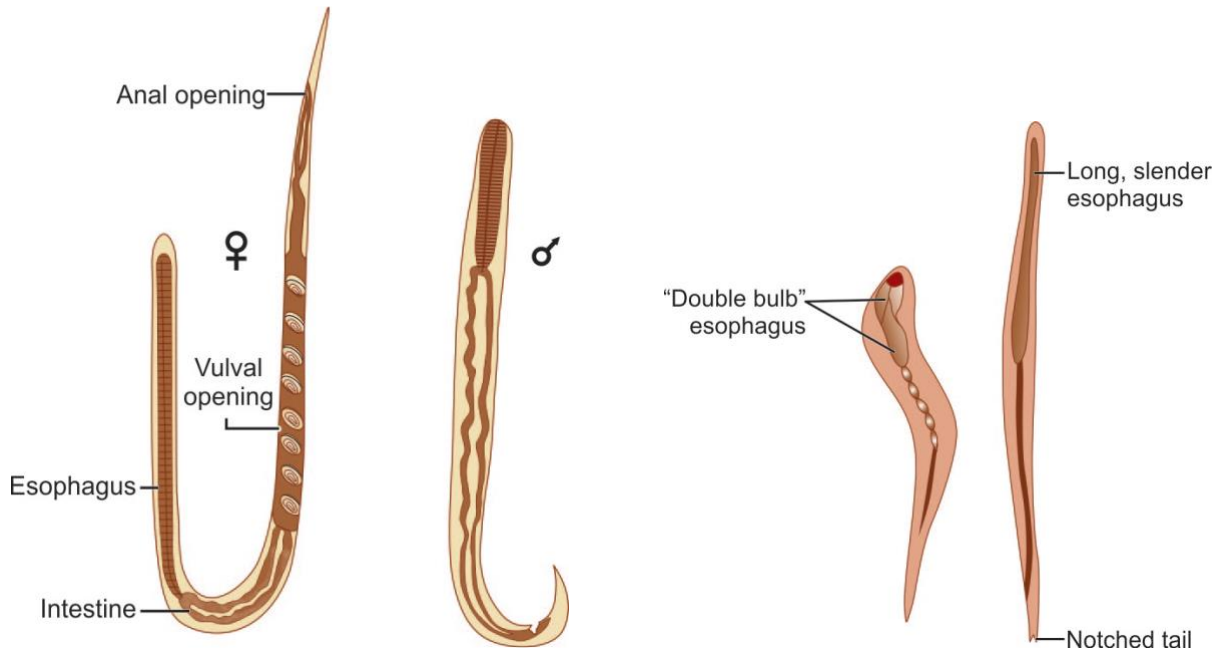
Site of infection: small intestine

Morphology:

Smallest nematodes, worms live as free living and parasitic living depending on the conditions, Mouth with three to six lips

* The parasitic females being so small, ovoviviparous (laying eggs containing fully formed larvae, which hatch out immediately)

* The male tail is very sharply flexed, and there are two small brown spicules,



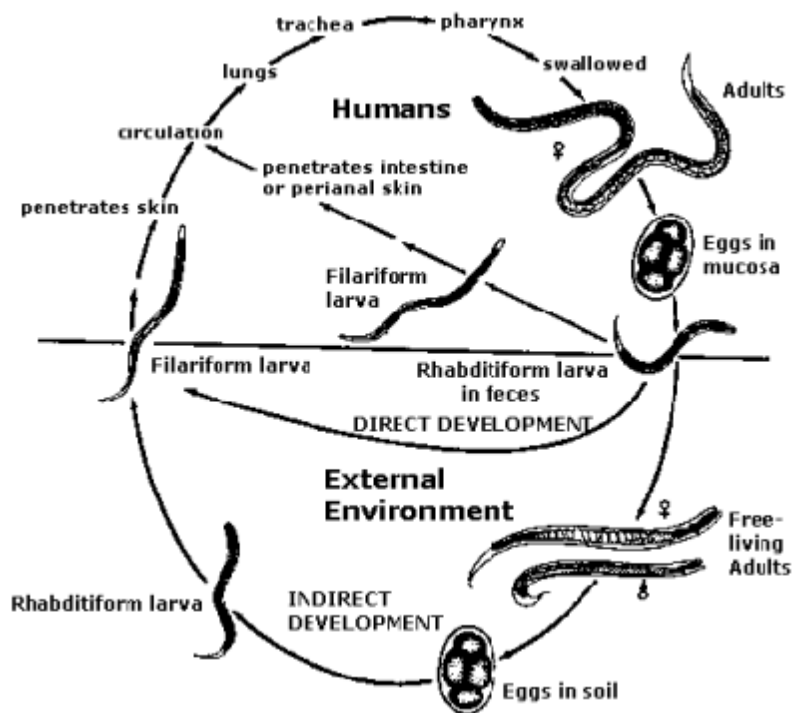
Adult worm (male and female)

Larva of *Strongyloides stercoralis*. **A.** Rhabditiform
B. Filariform larva

Difference between filariform Larva of hook worm and Strongyloides

Hook worm	Strongyloides
Esophagus extended up to 25% of the total body length	Esophagus extended up to 40% of the total body
Sheathed	Non sheathed
Tail pointed	Tail: forked

[Life cycle]



Infective stage: Filariform larva

Diagnostic stage: Rhabditiform larva

Symptoms:

- * colic and diarrhea mostly with blood.
- * pulmonary inflammation with cough and fever.
- * Inflammatory in the intestine around dead worms and ova.

[Diagnosis]

- * Finding larvae in feaces, sometimes in sputum.
- * Incubation patient stool in a damp soil for a while, giving a result to see the free living worms.