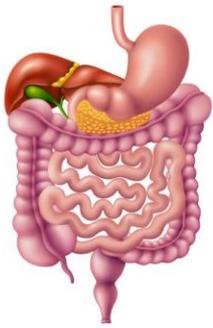


Intestinal nematodes

Part 1

Presented by

Associate Professor Dina Abou Rayia



Intestinal nematodes



- **Inhabit the large intestine:**

- *Enterobius vermicularis*
- *Trichuris trichiura*

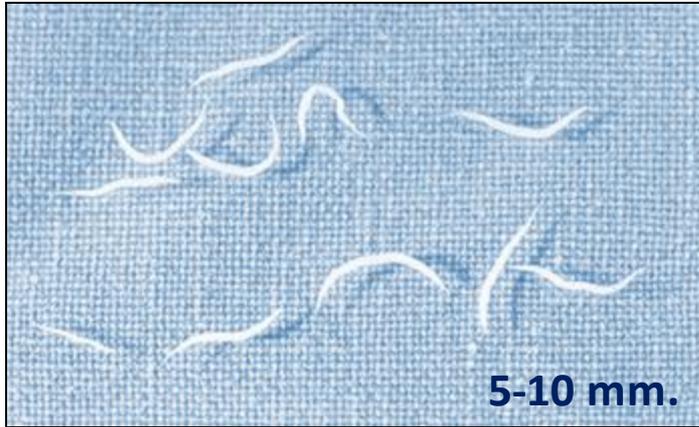
- **Inhabit the small intestine:**

- *Ascaris lumbricoides*
- Hookworms
- *Strongyloides stercoralis*

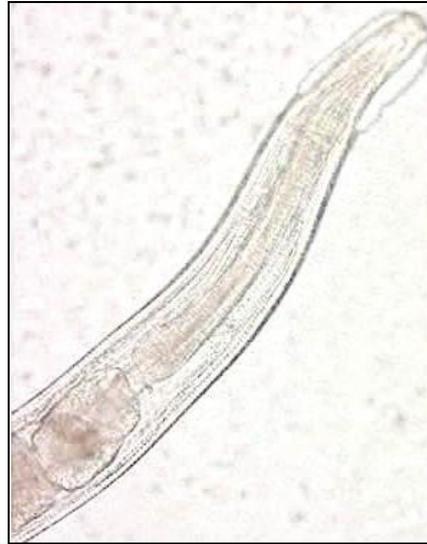
Enterobius vermicularis (Oxyuris-pin worm)



- **Geographical distribution:** Cosmopolitan



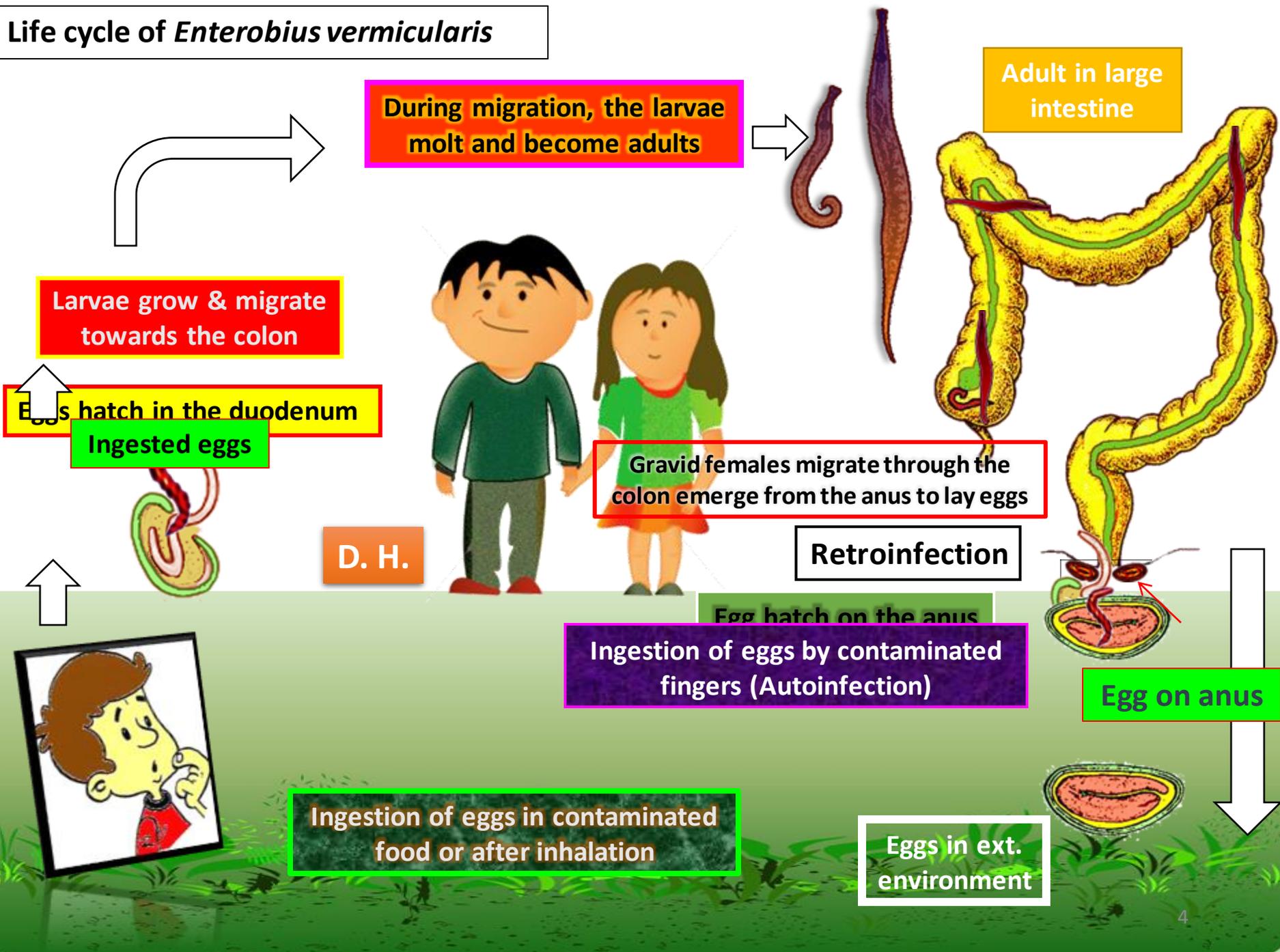
Double bulbed
esophagus



Size: 50x20 μ
Shape: Planoconvex (D shape)
Colour: Translucent
Content: Mature larva



Life cycle of *Enterobius vermicularis*



Enterobius vermicularis



- **Habitat:** Large intestine especially caecum.
- **Hosts:**
 - D.H: Man
- **Diagnostic stages:**
 - Eggs
 - Adults
- **Infective stage:** Mature embryonated egg containing larva
- **Mode of infection:**
 - Autoinfection (retro-infection-external autoinfection)
 - Ingestion of contaminated food
 - Inhalation of eggs in dust.

Enterobius vermicularis



Clinical aspect:

- Due to the migration of worms, they cause perianal, perineal & vaginal itching (pruritis) worsens at night and may cause urinary tract inflammation.
- Insomnia, restlessness and nocturnal enuresis.
- Worms in the appendix can cause appendicitis.

Prevention and control:

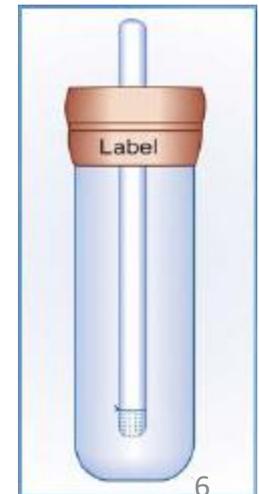
- Treating all members of a family in which infection has occurred.
- Washing hands before eating.
- Children wear tight underwear to prevent scratching of perianal skin during the night.

Treatment

- White precipitate ointment
- Albendazole

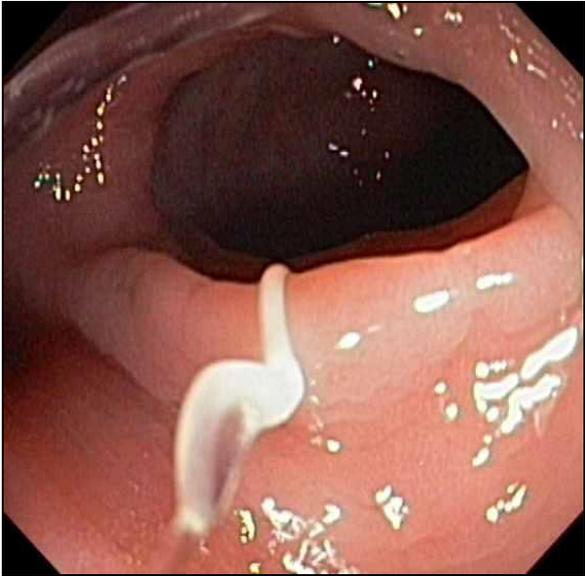
Laboratory diagnosis:

- Finding eggs from perianal skin using cellulose adhesive tape or NIH swab.
- Finding eggs and adult worms in the faeces.
- Eggs could be detected in urine.





***E.V.* adult in
perianal
region**



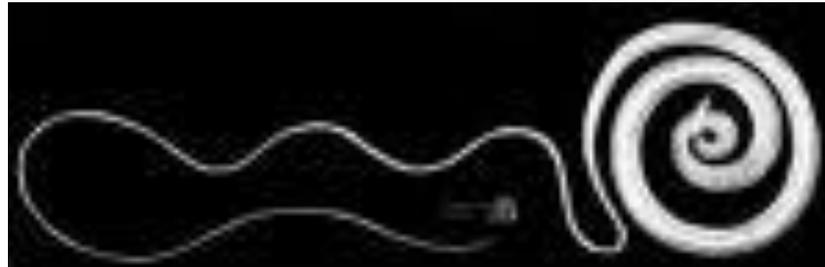
***E.V.*
By colonoscopy**

Trichuris trichiura (Whip worm)



- **Geographical distribution:** Cosmopolitan

Adults from 3-5 cm



Cellular esophagus



Size: 50x20 μ

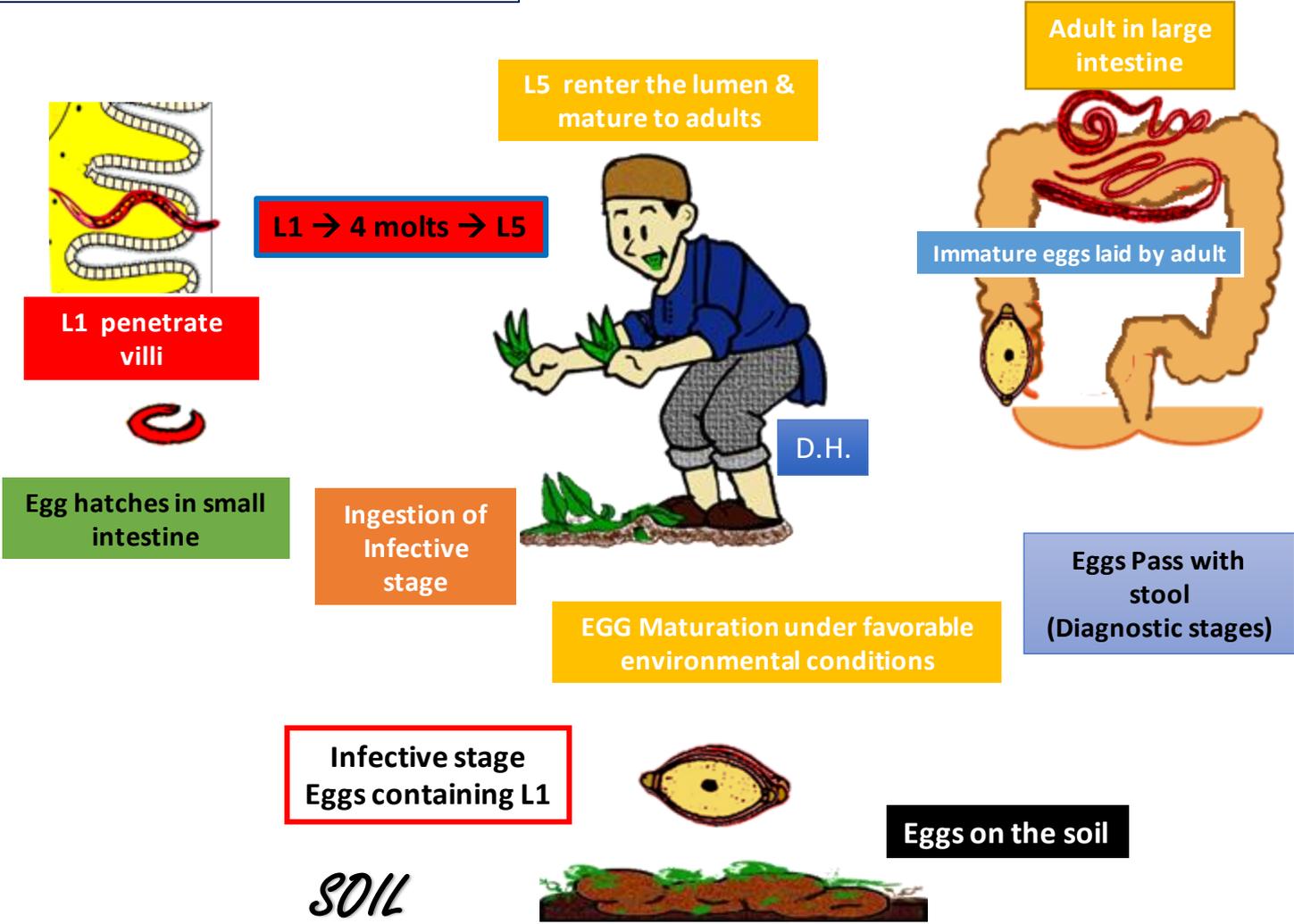
Shape: Barrel shape with two polar mucoid plugs

Colour: Brownish

Content: Immature



Life cycle of *Trichuris trichiura*



Trichuris trichiura (Whip worm)



- **Habitat:** Large intestine

- **Hosts:**

- D.H: Man
- R.H: Monkeys and pigs



- **Diagnostic stages:**

- Immature eggs
- Adults

- **Infective stage:** Mature embryonated egg containing first-stage larva

- **Mode of infection:**

- Ingestion of contaminated food.

Pathogenesis & Symptomatology



Disease: Trichuriasis

➤ Embedded anterior part → haemorrhage and mucosal ulceration.

➤ Distension, nausea, vomiting, abdominal pain & **bloody diarrhea**.

➤ **Dysentery**: Due to the affection of rectal mucosa → tenesmus with mucus and blood and **rectal prolapse** especially in children.

Obstruction of the appendix and secondary bacterial infection → **appendicitis & abscess**.

Diagnosis:
Detection of eggs or adults in stool or by colonoscopy

Treatment: Albendazole

Anaemia:

➤ **Microcytic hypochromic anaemia**: Due to continuous blood loss from bleeding sites or blood sucked by the worm.

➤ **Hyperchromic pernicious anaemia**: Due to toxins.



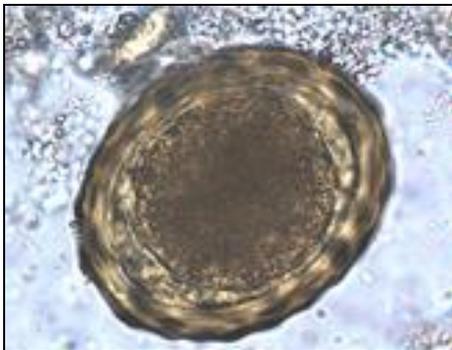
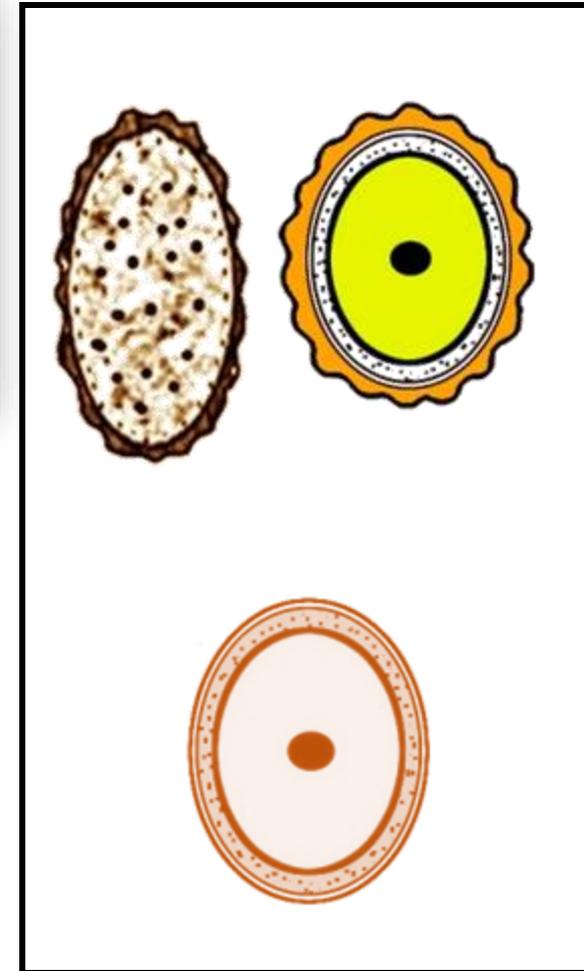
Ascaris lumbricoides



- **Geographical distribution:** Cosmopolitan

Adults 20-40cm.

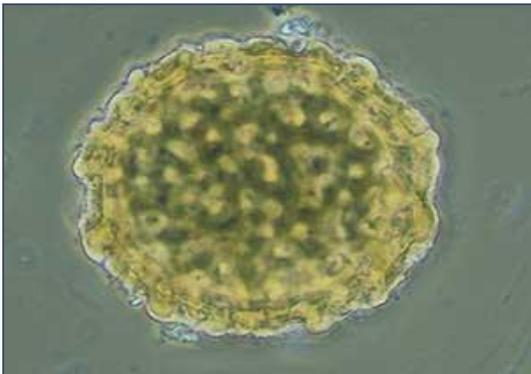
Club shape esophagus



Eggs (D.S)

1-Fertilized egg

- Size:** 60 × 45 μm
- Shape:** Oval to round.
- Shell:** Inner thick shell and outer mamillated coat.
- Color:** Golden brown (bile stained).
- Content:** Immature (one- cell stage).

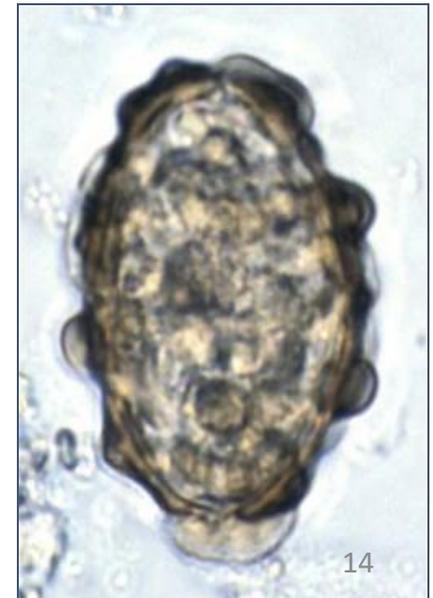


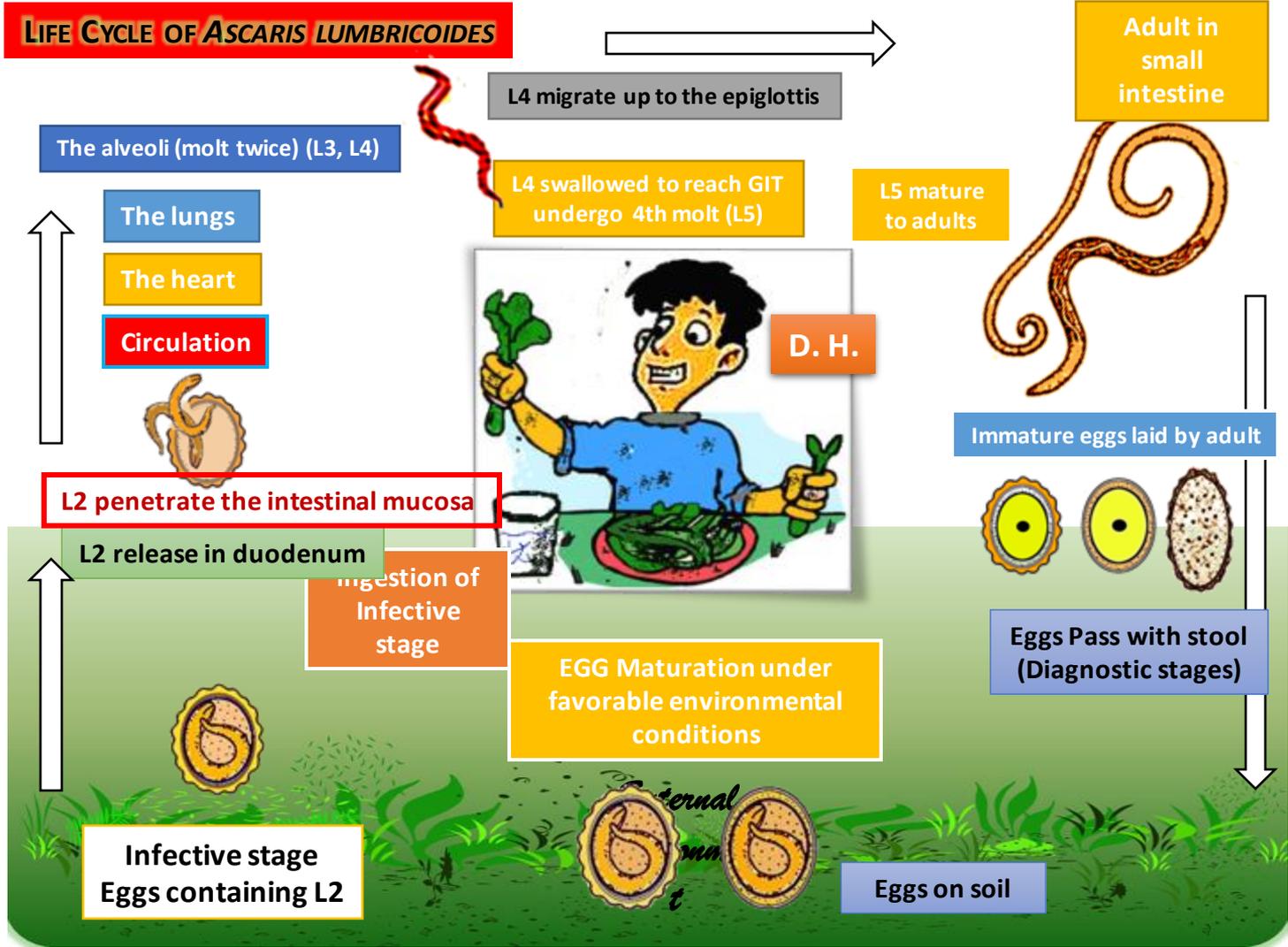
2- Unfertilized egg

- Size:** 90 × 45 μm.
- **Shape:** Elongated.
- **Shell:** Thinner with ill-developed mamillated coat.
- **Color:** Golden brown.
- **Content:** Multiple refractile granules.

3- Decorticated egg

Fertilized or unfertilized egg that loses the mamillated layer.





Ascaris lumbricoides

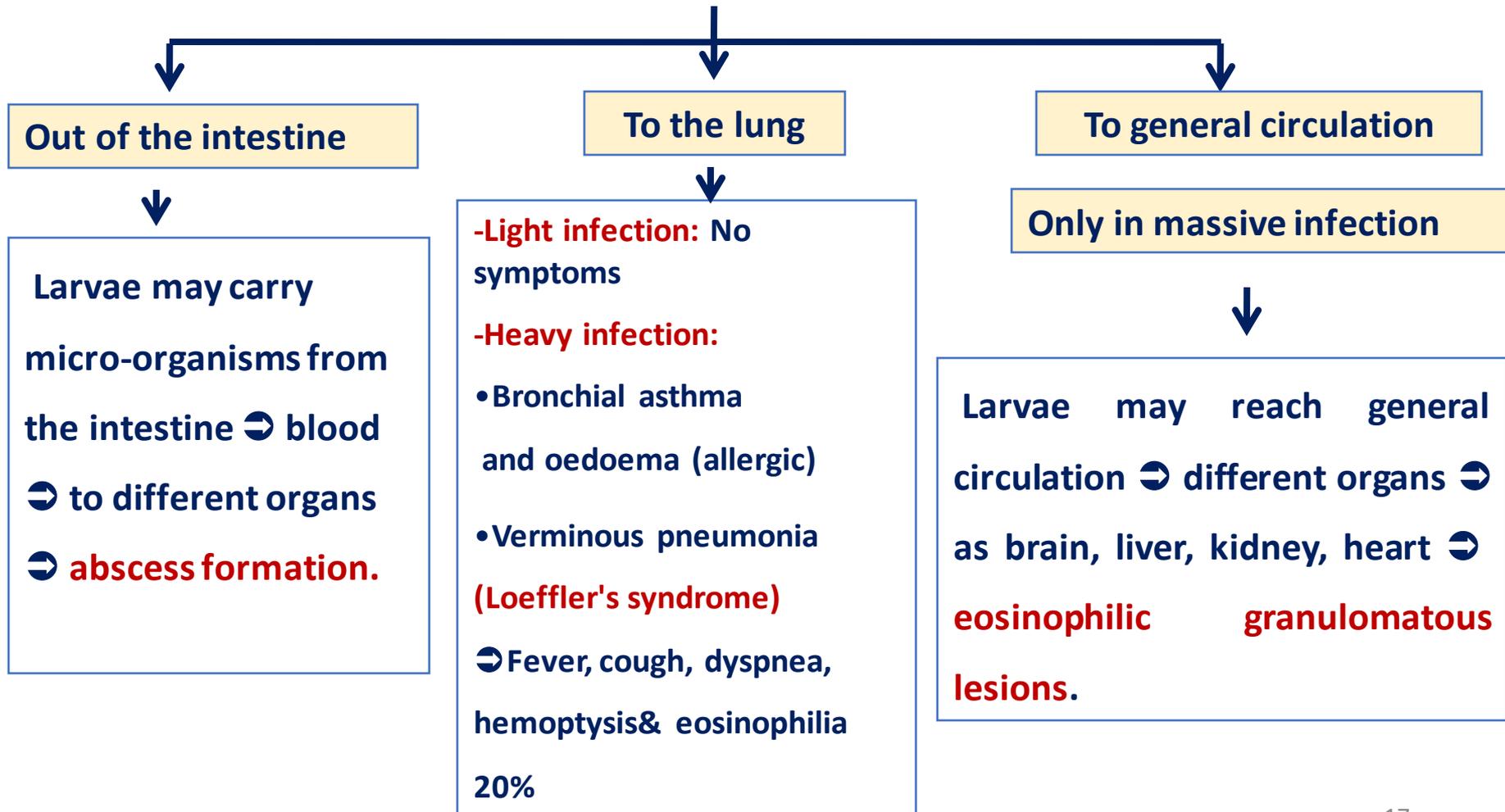


- **Habitat:** Small intestine
- **Hosts:**
 - D.H: Man
- **Diagnostic stages:**
 - Immature eggs (fertilized-unfertilized and decorticated)
 - Adults
- **Infective stage:** Mature embryonated egg containing second-stage larva
- **Mode of infection:**
 - Ingestion of contaminated food and drinks.
 - Ingestion of eggs with contaminated hands from soil.

Pathogenesis and symptomatology Disease: Ascariasis

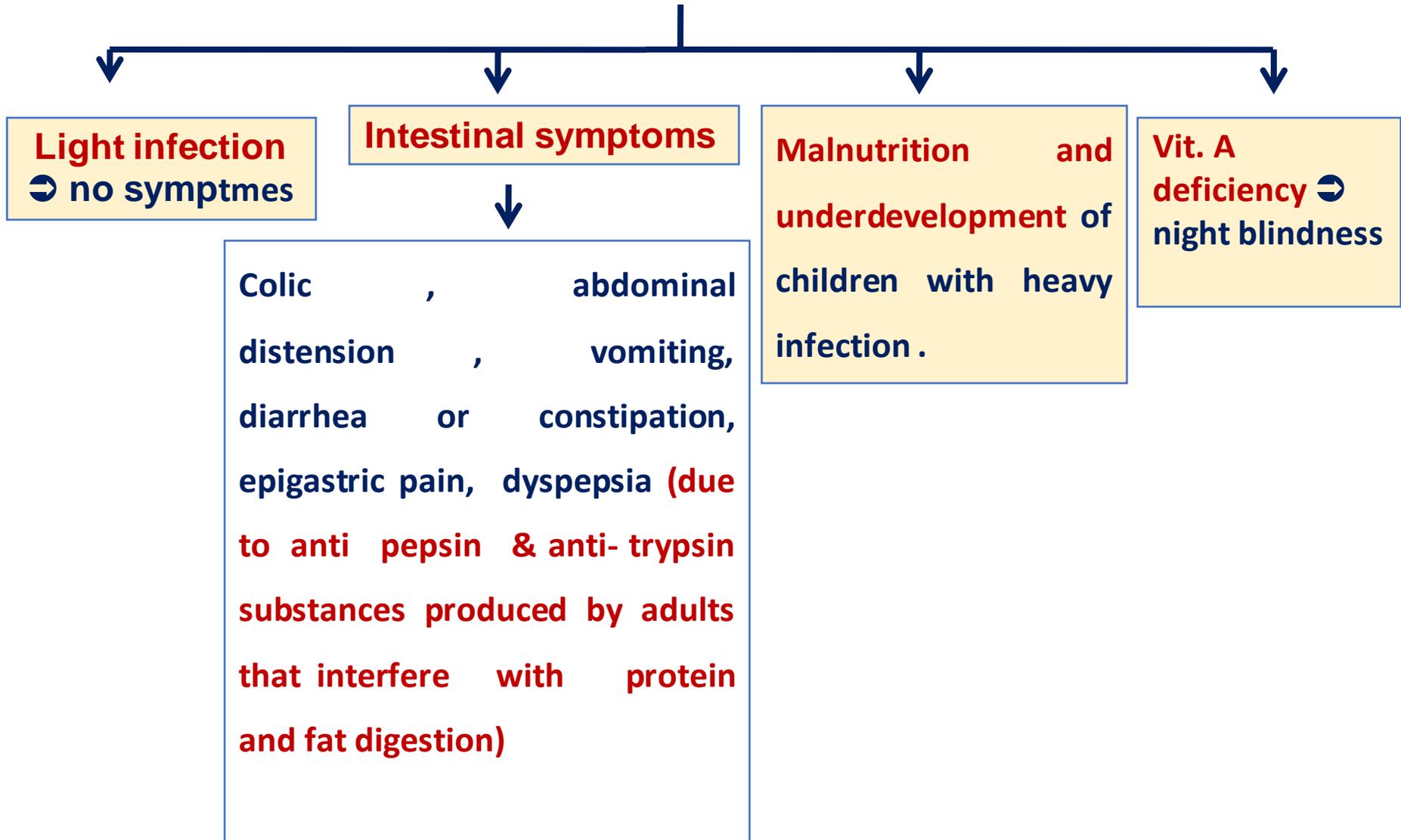


1) Larval migratory phase





2) Intestinal phase



3) Complications



↓ (1)

Worm migration by fever, drugs or anathesia

Obstruction of the pancreatic duct → acute pancreatitis.

-Obstruction of the bile duct → cholecystitis and obstructive jaundice.

-Entering liver parenchyma → liver abscess.

-Stomach → vomiting.

-Oesophagus → escapes from the mouth.

-Nasopharynx → escapes from the nose.

-Oropharynx → Eustachian tube → middle ear and exit through external auditory meatus.

-Hypopharynx → larynx and trachea → aspirated → suffocation and lung abscess.

-Appendicitis

↓
(2)

Intestinal obstruction



↓
(3)

Perforation of the intestinal wall →
peritonitis



Laboratory diagnosis

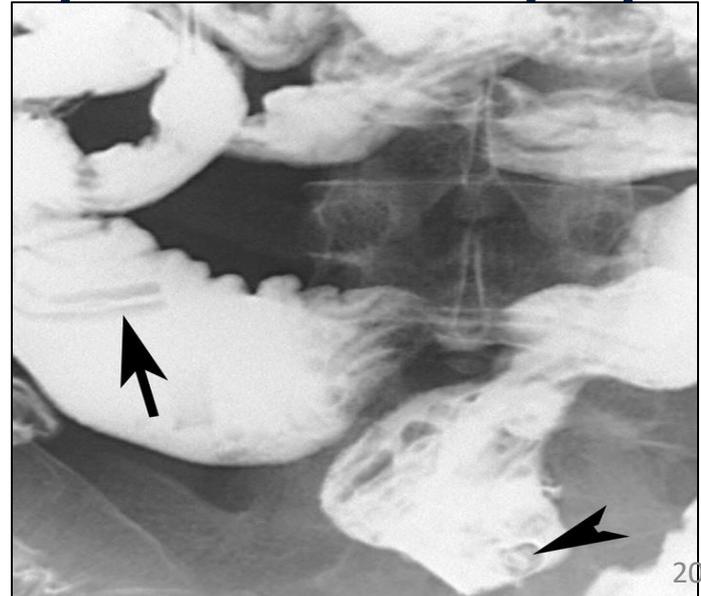


1) Detection of **eggs** in stool by direct or concentration

2) Detection of the **adult worms** in stools or vomits.

3) Detection of adult worms in the abdomen **by X-ray**

after barium meal. They appear as parallel radio-opaque shadows (**tram way sign**).



Treatment: Albendazole





Explain why?

- A patient with ascariasis should be treated before any surgical procedures.
- White precipitate ointment is important for the treatment of oxyuris infection.
- Anaemia may complicate *Trihuris trichiura* infection