Enterobius vermicularis
Pin worm (Oxyuris)

By

Professor Dina Moustafa Abou Rayia

Medical Microbiology and Immunology Department

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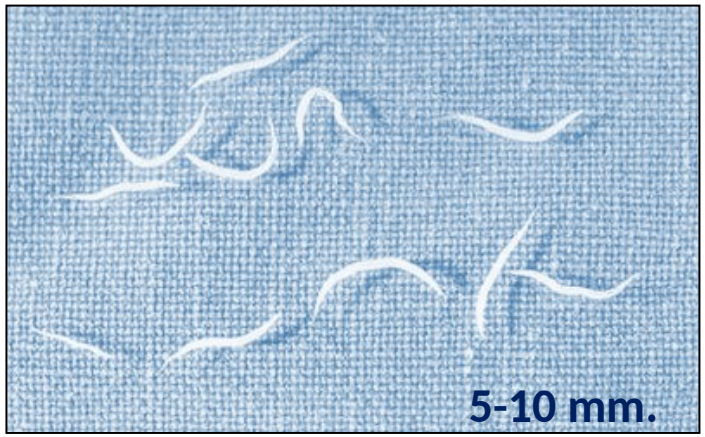
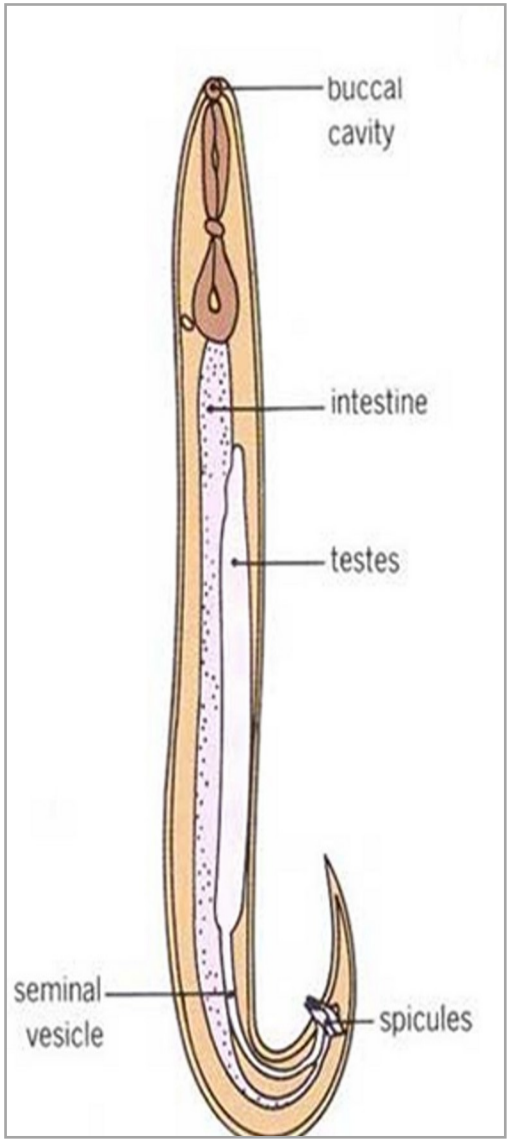
Enterobius vermicularis (Oxyuris-pin worm)

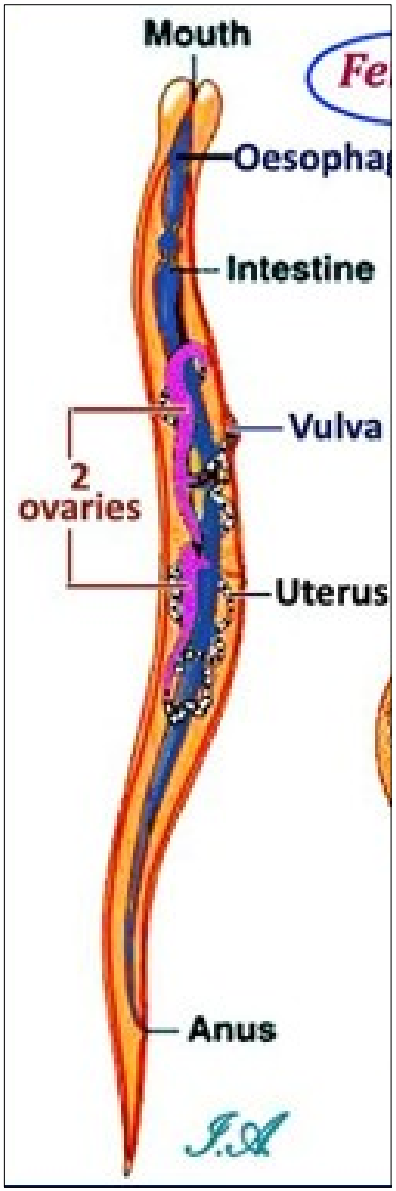
- **Geographical distribution**: Cosmopolitan



- Double bulbed esophagus
- Two cephalic alae (cuticular expansions)



Single spicule
Subterminal cloaca



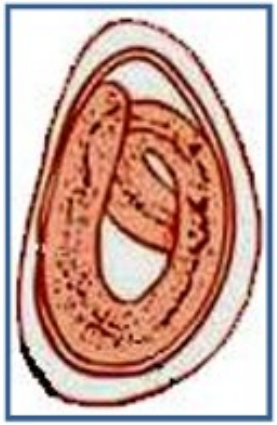
Two sets of genitalia
Vulva opens at the anterior 1/4

Size: 50x20 µ

Shape: Planoconvex (D shaped), oval, with a shell composed of two layers and covered by thin albuminous sticky layer

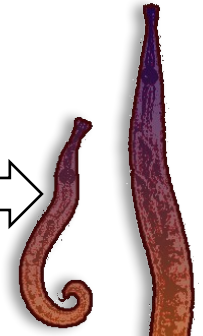
Colour: Translucent

Content: Mature larva

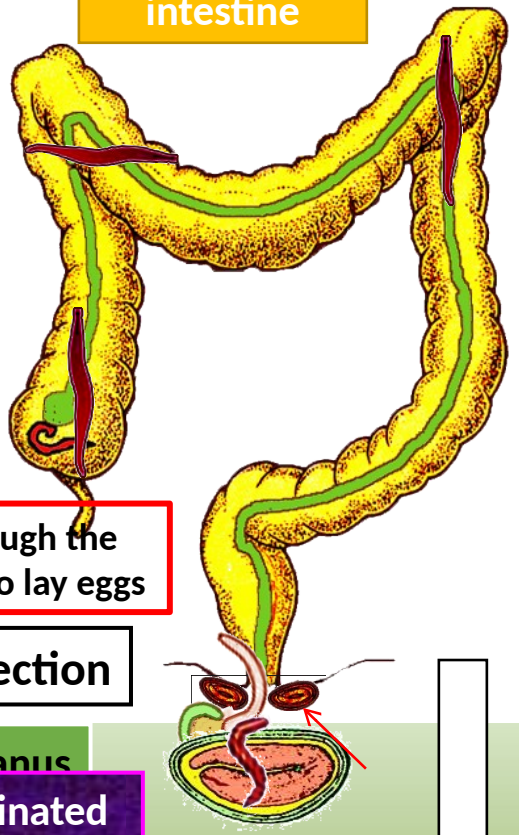


Life cycle of *Enterobius vermicularis*

During migration, the larvae molt and become adults



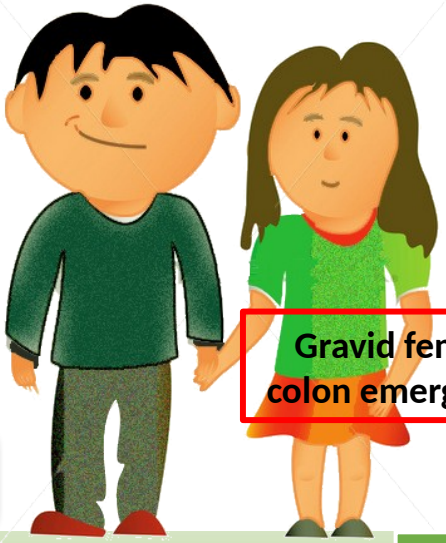
Adult in large intestine



Larvae grow & migrate towards the colon

Eggs hatch in the duodenum

Ingested eggs



Gravid females migrate through the colon emerge from the anus to lay eggs

D. H.

Retroinfection

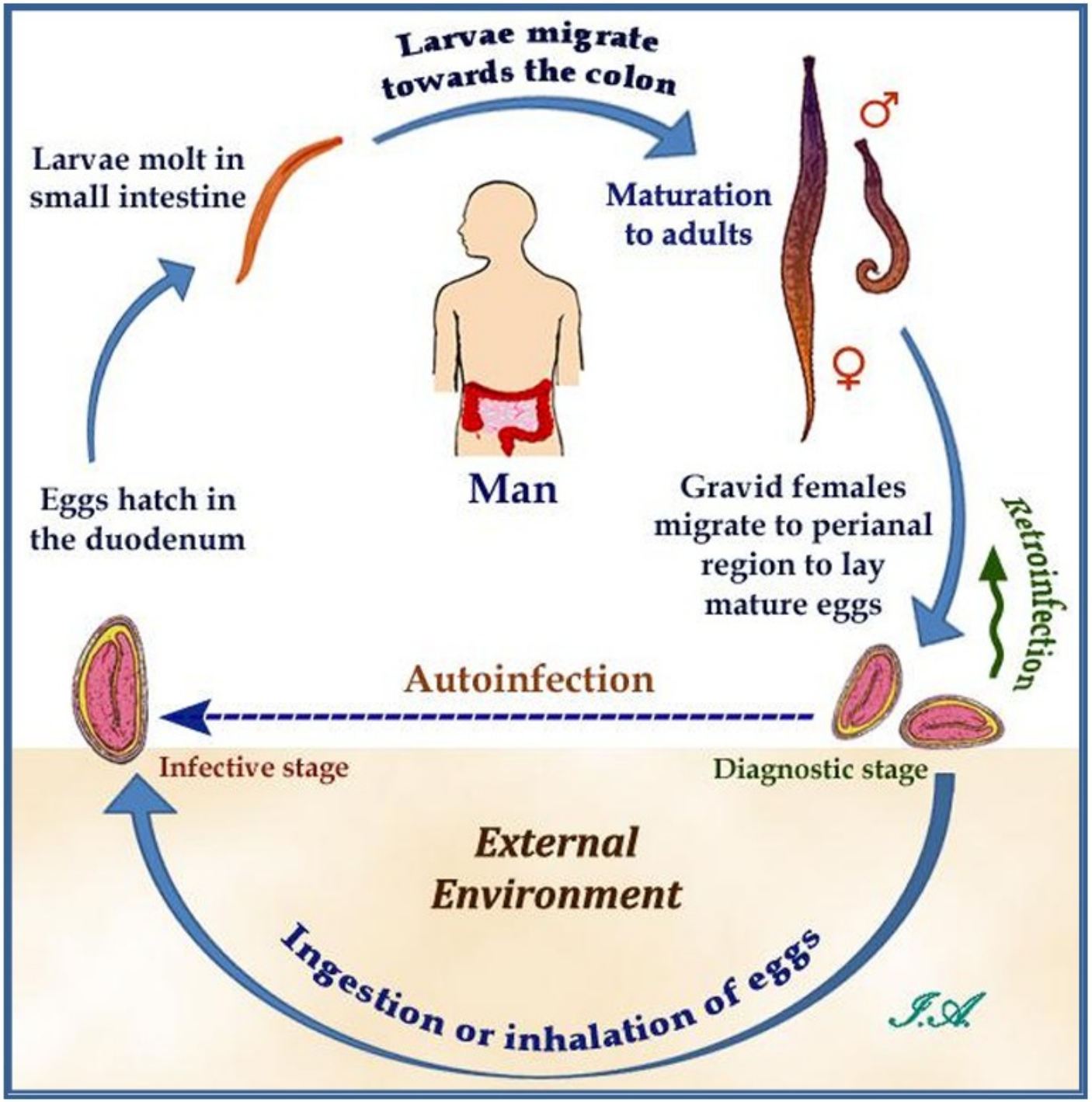
Egg hatch on the anus

Ingestion of eggs by contaminated fingers (Autoinfection)

Egg on anus

Ingestion of eggs in contaminated food or after inhalation

Eggs in ext. environment


Larvae migrate towards the colon
Larvae molt in small intestine
Maturation to adults
♂
♀
Man
Eggs hatch in the duodenum
Gravid females migrate to perianal region to lay mature eggs
Retroinfection
Autoinfection
Infective stage
Diagnostic stage
External Environment
Ingestion or inhalation of eggs
I.A

1) The usual habitat of the pinworm is the caecum and the adjacent portions of the large and small intestines. Fertilization occurs and males die shortly after fertilization.

2) The gravid females migrate to the perianal and perineal regions mostly by night where they lay the eggs.

3) After ingestion, the eggs hatch in the small intestine and larvae moult twice then come down to their habitat in the large intestine and moult again to reach adult stage.

4) Eggs deposition started 2–4 weeks after infection.

Enterobius vermicularis

- **Habitat:** Large intestine especially caecum and adjacent parts of ileum and appendix.
- **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 (pruritis) worsens at night.
- Insomnia, and restlessness.
- In females, worms may migrate through the urethra causing dysuria, and nocturnal enuresis, to the urinary bladder causing cystitis, or the vulva and vagina causing irritation.
- Worms in the appendix can cause appendicitis.

Laboratory diagnosis:

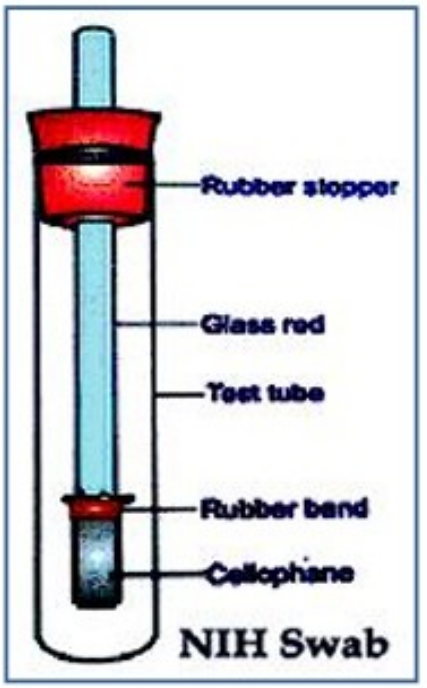
- Finding eggs from perianal skin using scotch adhesive tape or NIH swab.
- Finding eggs and adult worms in the faeces.
- Eggs could be detected in urine.

Treatment

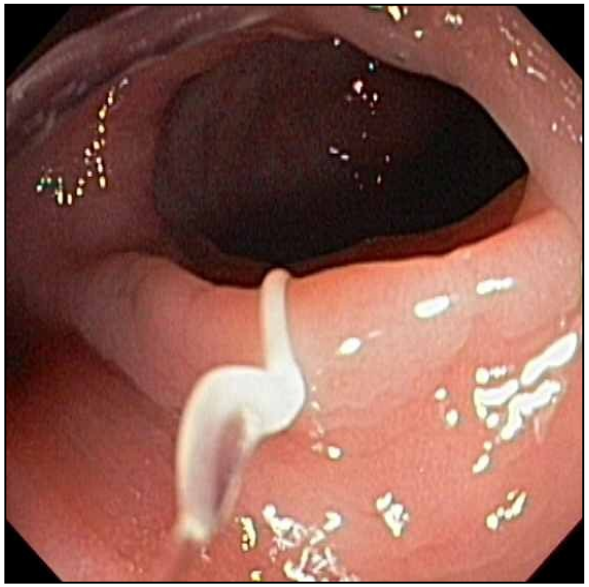
- Topical mercurial ointment (White precipitate ointment ????
- Albendazole

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.



E.V. adult in perianal region

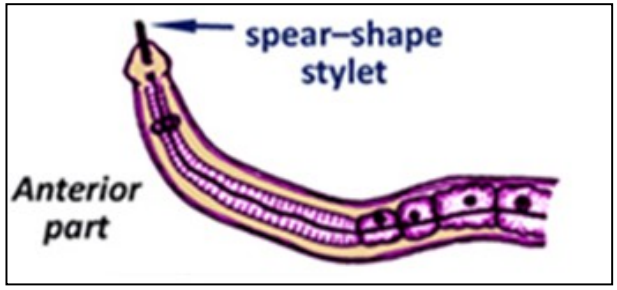


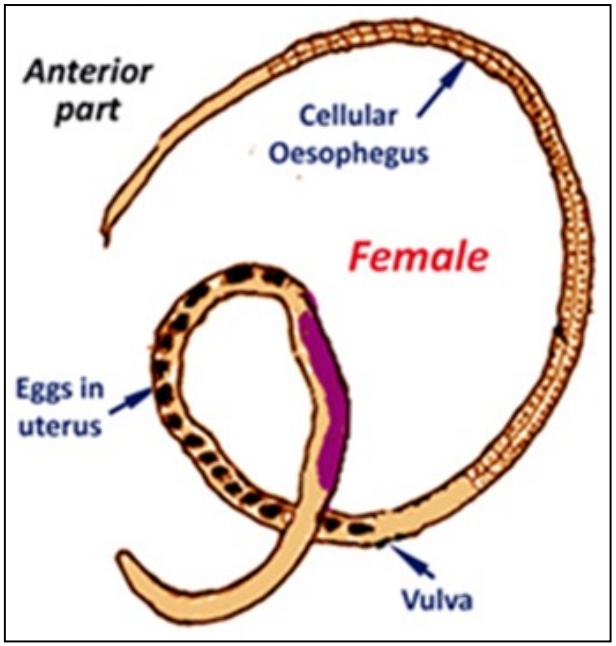
E.V.
By colonoscopy

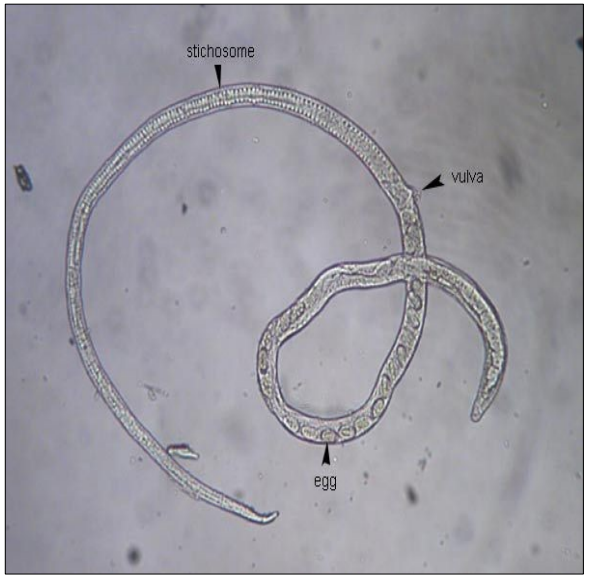
Capillaria philippinensis

Geographical distribution

- *Capillaria philippinensis* is endemic in the Far East. Sporadic cases have also been found in Egypt, Iran, Spain, and Italy.
- Migratory birds are probably the means by which the infection has spread to other countries

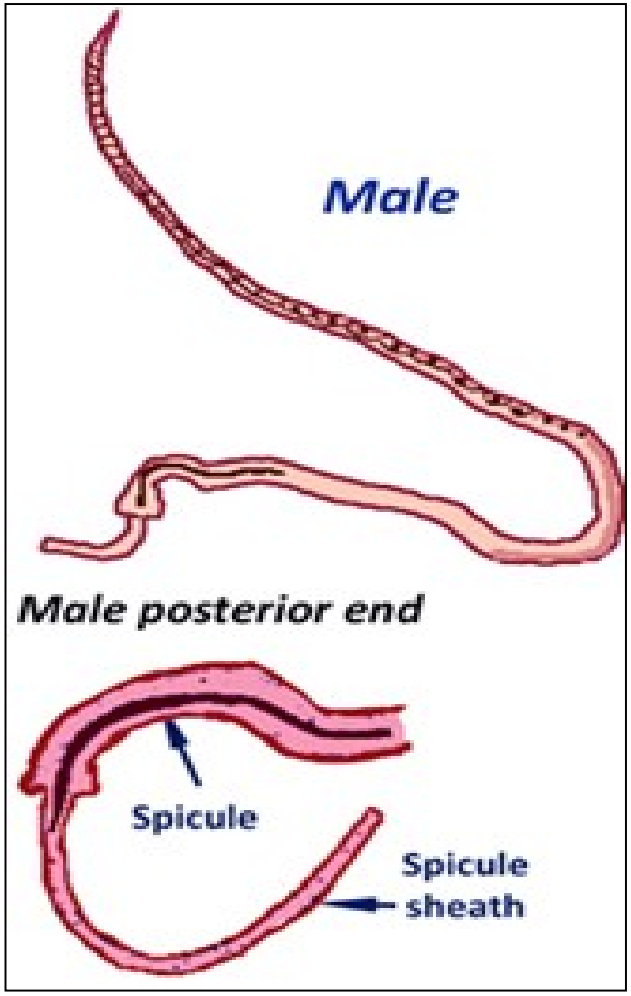






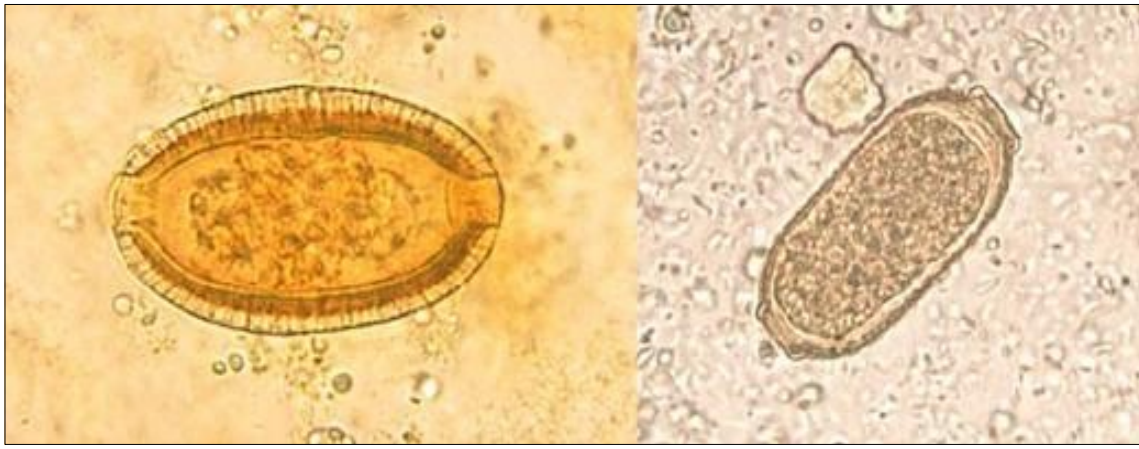
♀ 3.5 mm

Females are oviparous or larviparous



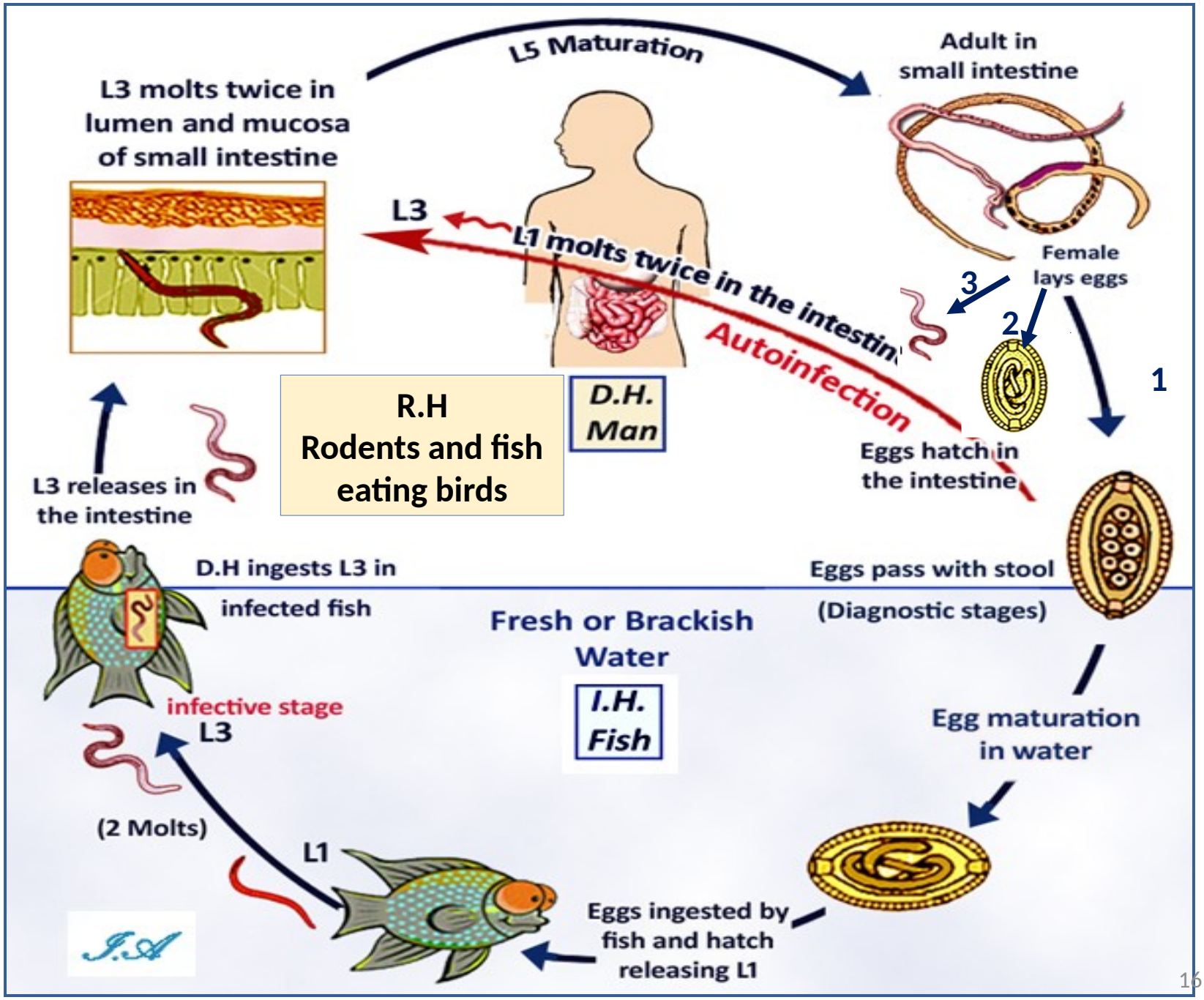
♂ 2.5 mm

Morphology



Egg:

- **Size:** 40 × 20 µm.
- **Shape:** Peanut-shaped with small and flat bipolar plugs.
- **Shell:** Thick.
- **Color:** Yellowish brown.
- **Content:** Immature embryo (one cell stage).


L5 Maturation
Adult in small intestine
L3 molts twice in lumen and mucosa of small intestine
L3
L1 molts twice in the intestin
Autoinfection
Female lays eggs
3
2
1
R.H
Rodents and fish eating birds
D.H. Man
L3 releases in the intestine
Eggs hatch in the intestine
D.H ingests L3 in infected fish
Eggs pass with stool (Diagnostic stages)
Fresh or Brackish Water
I.H. Fish
infective stage L3
Egg maturation in water
(2 Molts)
L1
Eggs ingested by fish and hatch releasing L1

1) Adults live in the mucosa and lumen of the small intestine. Females lay unembryonated eggs in the intestinal lumen. Eggs pass with stool to the external environment (usually the fresh or brackish water).

2) Eggs embryonate in water in 5–10 days - swallowed by small fresh- or brackish water fish - the eggs hatch giving rise to larval stages (L1) - After 2 moults, filariform larvae (L3) develop in the fish's mesenteric and peripheral tissues.

3) Infection occurs by ingestion of infected raw or undercooked fish - in the lumen and mucosa of the small intestine, L3 larvae develop into adults after 2 moults in 10 days.

4) Autoinfection and hyperinfection: The adult female is sometimes larviparous or can produce thin-walled eggs that hatch within the intestinal tract. These newborn larvae moult, reinvade the intestinal mucosa, and mature to adults.

- **Habitat:** The small intestine
- **Hosts:**

  D.H.: Man

  I.H.: Fish

  R.H.: Rodents, birds, fish-eating animals

- **Diagnostic stage:** Eggs, adults and larvae

- **Infective stage:** Filariform larva (L3)

- **Mode of infection:** Ingestion of undercooked fish containing L3 and internal autoinfection

Disease: Capillariasis philippinensis

Extensive epithelial erosions with chronic inflammation ⌙ malabsorption of protein, fat, sugars & electrolytes loss ⌙ fequent diarrhea (protein lossing enteropathy), vomiting, abdominal pain, anorexia, oedema of lower limbs & weight loss.

Death may occur due to:

- Hypokalaemia.
- Heart failure.
- Cerebral oedema.

Capillaria philippinensis is the most virulent helminths of human due to hyperinfection and progressive damage of the mucosa caused by repeated penteration of the mucosa by the adult worm.

Laboratory Diagnosis

Direct methods

- **Stool examination: Detection of eggs, larvae and adults.**
- **Jejunal aspiration or biopsy for eggs, larvae and adults**

Indirect methods

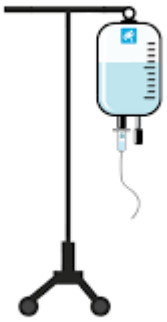
- **Blood examination: Hypoproteinemia Electrolyte disturbance**

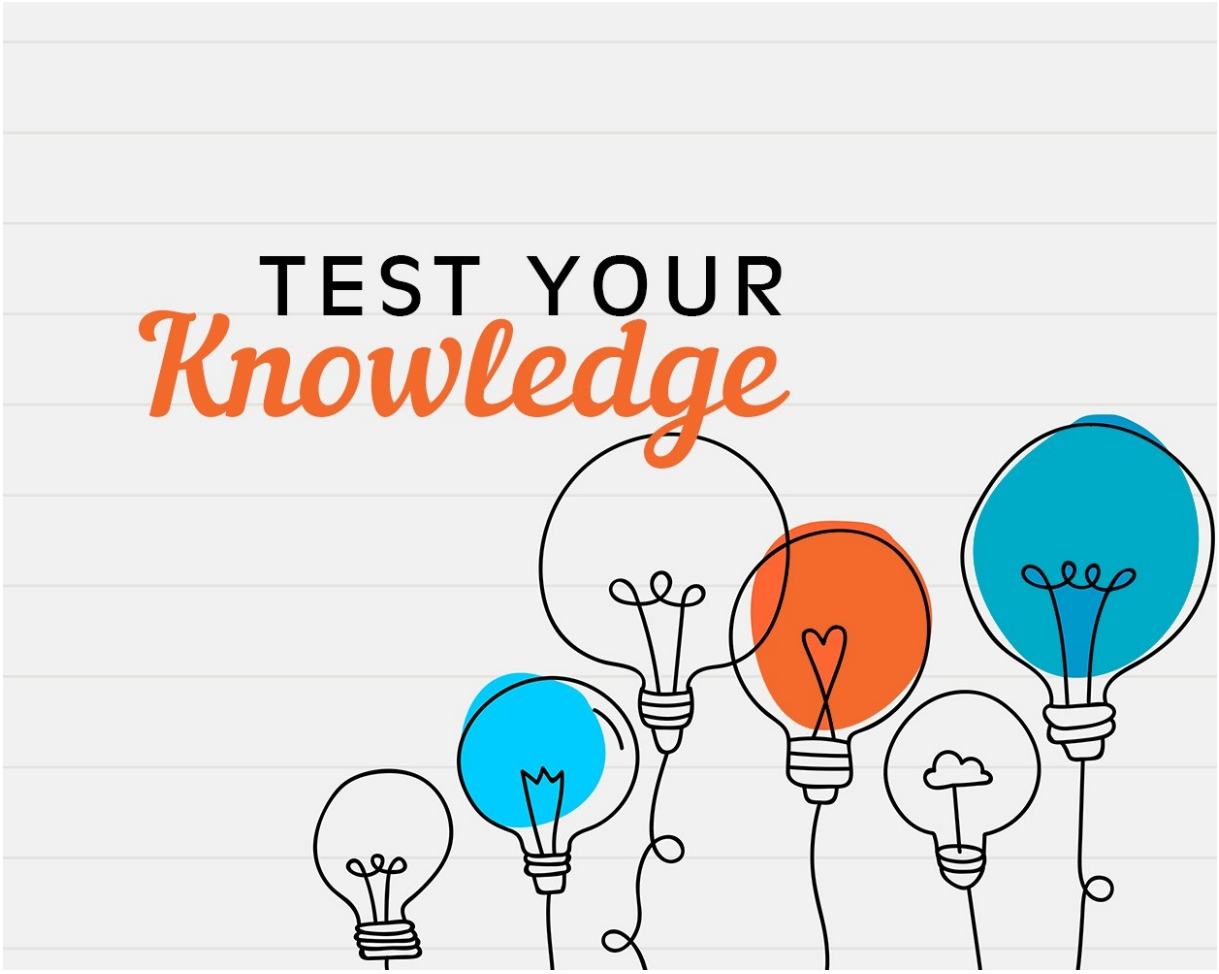
Treatment

Albendazole or mebendazole

Fluid and electrolyte:

(especially potassium) replacement is usually needed.




TEST YOUR
Knowledge

- **Mention**

- D.S and I.S in E.V and C.P.

- Complications of E.V and C.P

- **Explain why??**

- White precipitate ointment is used in the treatment of E.V