Heterophyiasis

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Overview

- *Heterophyes heterophyes* is parasitic flatworm of class *Trematoda*.
- It is a minute intestinal fluke, with different shapes.
- It infects small intestine of various fish eating mammals including humans.
- The disease caused by the fluke is called *heterophyiasis*.
Heterophyes heterophyes
Hetero= different
Phyes= shapes

Geographical distribution:
- **Egypt** in Nile Delta; especially around lakes of Manzala and Borollos.
- **Middle East.**
- **Far East.**
**Adult morphology:**

1) **Size:** 1.5-3mmx 0.5 mm.

2) **Shape:** pyriform or pear shape, spines cover the cuticle anterior.

3) **Suckers:** three suckers.
   - **Oral sucker:** small.
   - **Ventral sucker:** **large**.
   - **Genital sucker** (*gonotyle*): postero-lateral to ventral sucker.
4) Digestive system.

5) Genital system:
   - Testes: two, **oval**, opposite each other.
   - Ovary: single, **globular**, in front and between the testes.
Heterophyes heterophyes adult
Egg:

Size: 30 ×15 µ.

Shape: oval.

Shell: thick.

Special character: operculum at one pole and a small knob at the other.

Colour: golden yellow.

Content: mature (miracidium).
Cercaria:

- **Body:** 2 suckers, primitive gut, 2 dark eye spots, 7 pairs of penetration glands.

- **Tail:** with membrane along one side, the tip and the terminal 1/3 of the other side, pipe like. *(Lophocercous cercaria)*.
Life cycle:

Habitat: embedded between villi of small intestine.

Definitive host: man.


2nd I.H.: *Mugil* (Boury) and *Tilapia* (Bolty) fish.
**Reservoir hosts:** cats, dogs and any fish eating mammals.

**Infective stage:** encysted metacercaria in the muscles of the 2nd I.H. and their fins, gills and scales.

**Stages in life cycle:** egg → miracidium → sporocyst → redia → cercaria → encysted metacercaria → adult.
Mode of infection:

- By eating raw, improperly cooked or freshly salted fish for less than 10 days, containing encysted metacercaria.

- Through fingers or cooking utensils contaminated with the metacercaria during preparation of fish.

- In small intestine the cyst wall dissolves.

- Metacercariae embedded between the villi → adult.
Life cycle of *Heterophyes heterophyes*:

1. Infective Stage
2. Adult in small intestine
3. Cercariae released from snail
4. Cercariae penetrate the skin of fresh/brackish water fish and encyst as metacercariae in the tissue of the fish
5. Host becomes infected by ingesting undercooked fish containing metacercariae
6. Metacercariae excyst in the small intestine
7. Snail host ingests eggs, miracidia emerge from eggs and penetrate the snail's intestine
8. Fish-eating mammals and birds can be infected as well
9. Embryonated eggs each with a fully-developed miracidium are passed in feces

Sporocysts → Rediae → Cercariae → in snail tissue
- Eggs appear in stool 2-5 weeks after infection.

- In water, egg is ingested by the snail I.H.; brackish water and bottom feeding.

- Miracidium hatches \(\rightarrow\) sporocyst \(\rightarrow\) rediae \(\rightarrow\) cercariae, which escape in 30 days.

- Cercariae penetrate tissue of fish \(\rightarrow\) encysted metacercariae, infective within 20 days.
Pathogenicity and clinical picture:

**Disease:** heterophyiasis.

1) **Intestinal**: attachment of parasite to mucosa → inflammation, superficial ulcers and necrosis.

- Mild infection with no symptoms.

- Heavy infections cause:
  - Abdominal colic.
  - Abdominal discomfort.
  - Chronic intermittent diarrhea, sometimes with blood.
2) **Extra-intestinal**: eggs → general circulation → different organs → parasitic granuloma and fibrosis.

a. **heart** → myocarditis, valvular damage and heart failure.

b. **brain and spinal cord** → I.C.T., epileptic fits and neurological disorders.

c. **lung** → nodular shadows, mistaken for T.B.


**Diagnosis:**

1. Clinical.

2. Laboratory: by detection of the characteristic mature eggs in stool.

3. **Eosinophilia.**

Treatment:
- Praziquantel (Biltracid).
- Yomesan (Niclosamid).
Prevention and control:

- Avoid defecation in water.
- Avoid eating raw, insufficient cooked fish or salted less than 10 days.
- Proper grilling of fish.
- Fried fish is safe.
- Periodic examination of fishermen stool for *Heterophyes* eggs.
- Mass treatment of infected cases.
- Snail control.