



Trematodes

(Fasciola gigantica & Fasciolopsis busci)

General Microbiology
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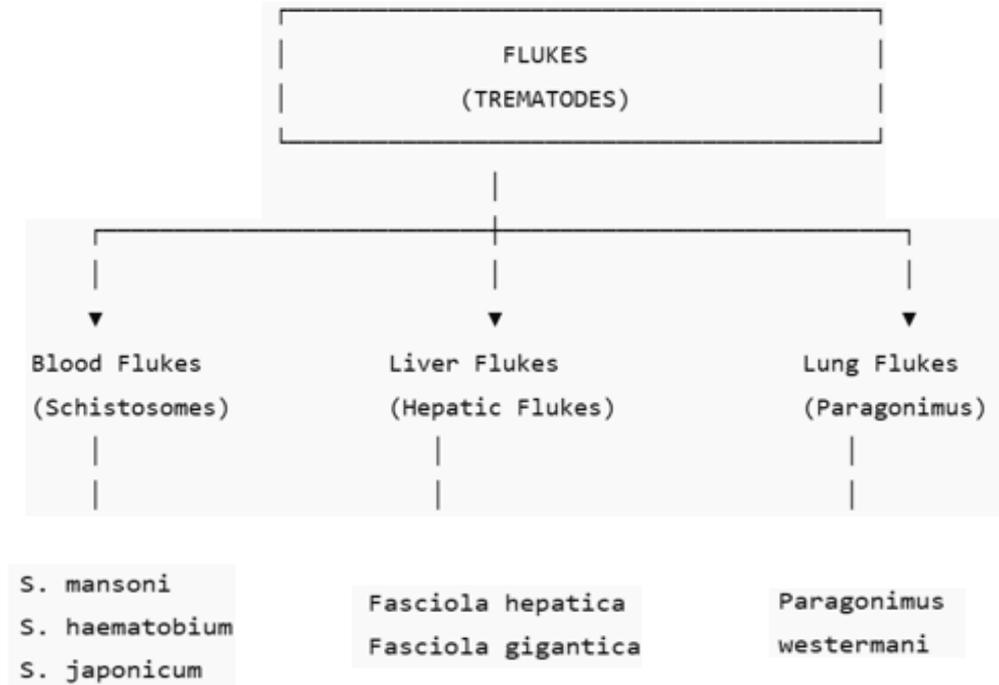
Trematodes

Trematodes (Flukes)

- Trematodes are a class of parasitic flatworms (phylum **Platyhelminthes**) known as **flukes**.
- They infect humans and animals, and many species cause significant disease, especially in regions with poor sanitation or exposure to freshwater.

General Characteristics

- **Flat, leaf-shaped worms**
- **Hermaphroditic** (except schistosomes, which have separate sexes)
- **Complex life cycles**
- Require a **snail as an intermediate host**
- Transmission often involves **freshwater, raw aquatic plants, or undercooked fish/crab**



Hepatic fluke

Fasciola gigantica (Giant liver fluke)

❖ Geographical distribution :-

- Common parasite of herbivorous animals especially in cattle raising countries.
- Human infections are found in many parts of the world in Africa, America & Europe.

❖ **Habitat** : Bile ducts in liver.

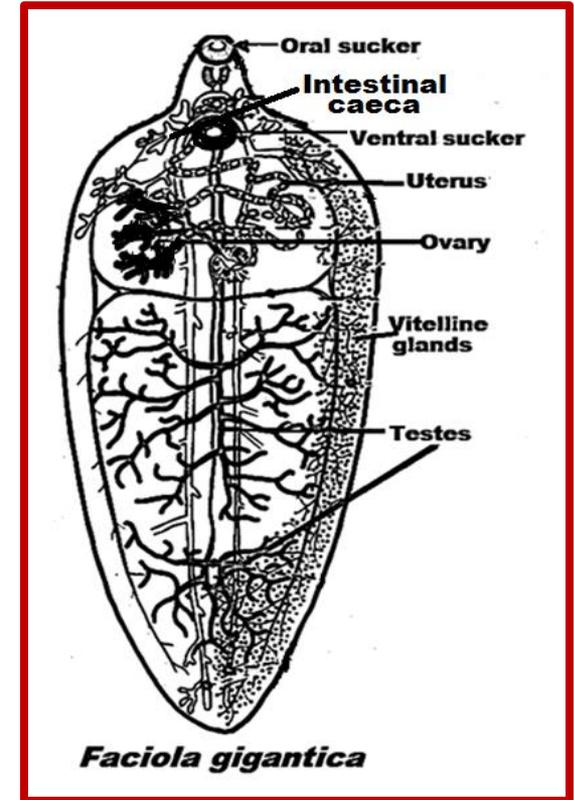
❖ **D.H** : Cattle, sheep and occasionally man.

❖ **I.H** : Snail (*Lymnaea snail*).

❖ **Disease**: Fascioliasis or liver rot.



Adult *Fasciola gigantica*



❖ Mode of infection:

- 1- Ingestion of water plants infected with encysted metacercaria.
- 2- Drinking water contaminated with encysted metacercaria.

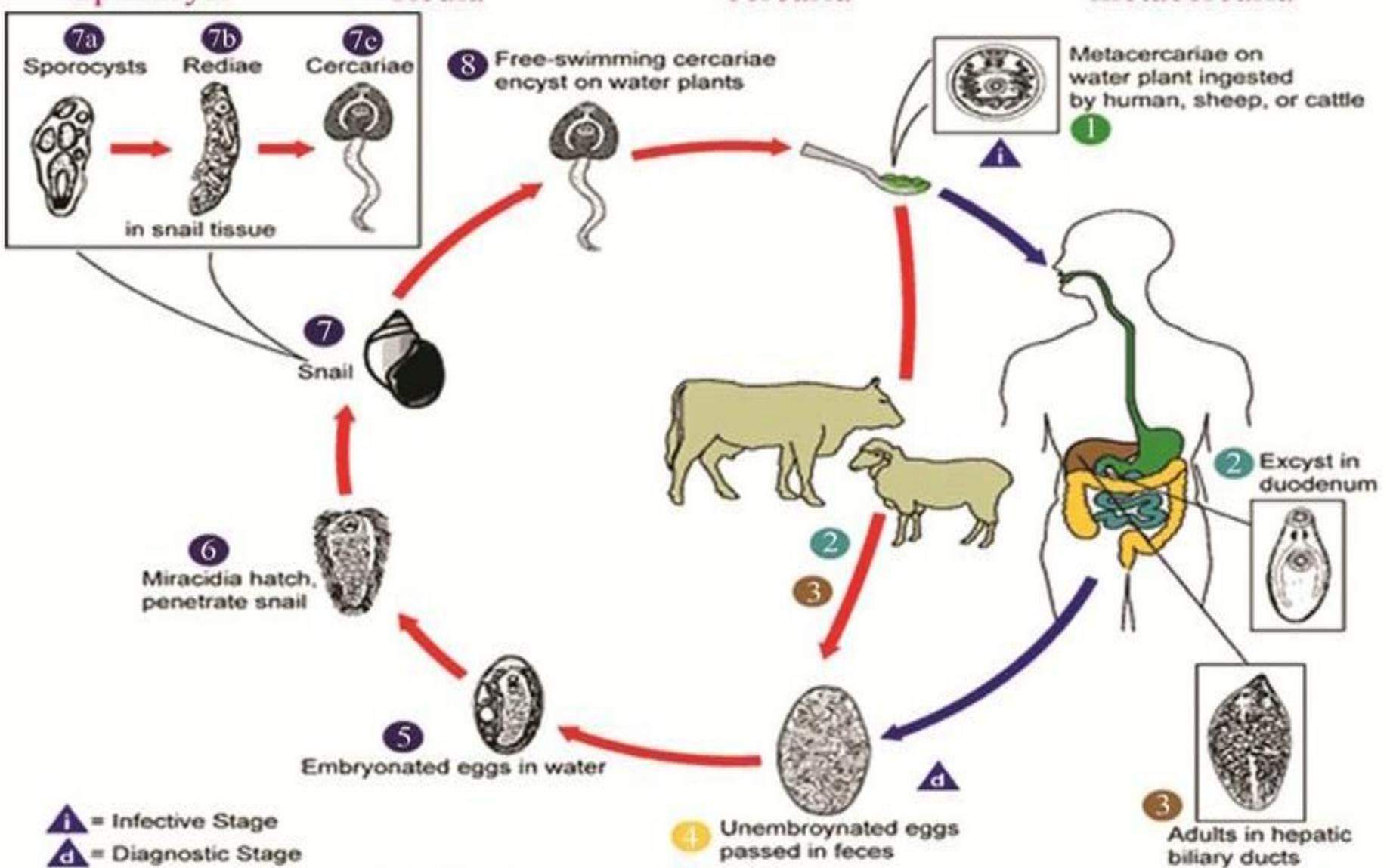


Fig. (2 - 9) *Fasciola* life cycle

Pathogenesis

1- Migratory phase

Migration of the juvenile worm ⇒ mechanical destruction of tissues & inflammation around migratory tracks.

2- Biliary phase

Adult fluke in the bile duct ⇒ 1- inflammation and hyperplasia of the epithelium ⇒ oedema & fibrous thickening of the ducts.

2-Mechanical obstruction ⇒ back pressure and atrophy of liver parenchyma, cirrhosis and possibly jaundice.

3- Gall bladder: enlarged, oedematous é thickening of its wall ⇒ fibrous adhesion to adjacent organs.

3- Ectopic location

Migrating juveniles may lose way and reach ectopic sites such as eye, brain,, lungs, kidneys, diaphragm, skin & sub-cutaneous tissue.

Clinical pictures

Invasive or acute phase

Due to migration of juvenile fluke up to the bile ducts.

Signs & Symptoms include:

- Fever (40 - 42 °c).
- Abdominal pain.
- Intestinal disturbances: Loss of appetite, flatulence, nausea and diarrhea.

Chronic or obstructive phase

Due to adult fluke in the bile duct

Signs & Symptoms include:

- Biliary colic and epigastric pain.
- Fatty food intolerance.
- Jaundice and pruritus.
- Right upper quadrant tenderness.
- Hepatomegaly, splenomegaly & ascites.

Diagnosis

Clinically

Patient presented with prolonged fever, hepatomegaly and high eosinophilia.

Laboratory

Direct

- Finding the eggs in the patient stool
- Ultrasonography.
- Computerized tomography (CT).

Indirect

- Intradermal test.
- Serological tests: I.H.A, C.F.T, ELISA.
- PCR.
- High eosinophilia.

❖ False Fascioliasis or spurious infection: The presence of **eggs in the stool** resulting not from an actual infection but from recent ingestion of infected liver containing eggs. This can be **avoided by** stop eating liver several days (3 - 7 days) before a repeat of stool examination.

Treatment

- **Triclabendazole (Fasinex).**
- **Dichlorophenol (Bithionol)**
- **Recently:** Nitazoxanide and Mirazid are successfully used.
- **Surgical** for ectopic flukes or biliary obstruction.

Halzoun (Parasitic pharyngitis)

❖ Causes :-

- 1) **Mechanical suffocation:** due to eating raw liver of sheep and goats as in **Lebanon & Syria**.
- Living adult *Fasciola* ⇒ attached to the mucous membrane of the pharynx ⇒ inflammation, oedema, dysphagia, dyspnea or even suffocation.

❖ **Treatment of halzoun:-**

- **Gargling with strong alcoholic drink ⇒ paralysis of the adult *Fasciola* or nymph ⇒ separate from the mucous membrane of the pharynx.**
- **Administration of emetics.**
- **Tracheostomy is indicated in laryngeal obstruction.**

❖ **Prevention :-**

Proper cooking of liver and animal tissues.

Fasciolopsis buski

The giant intestinal fluke

❖ Geographical distribution :

➤ Far east.

➤ More prevalent in areas where **pigs** are raised or where aquatic plants are consumed.

❖ **Habitat** : Small intestine.

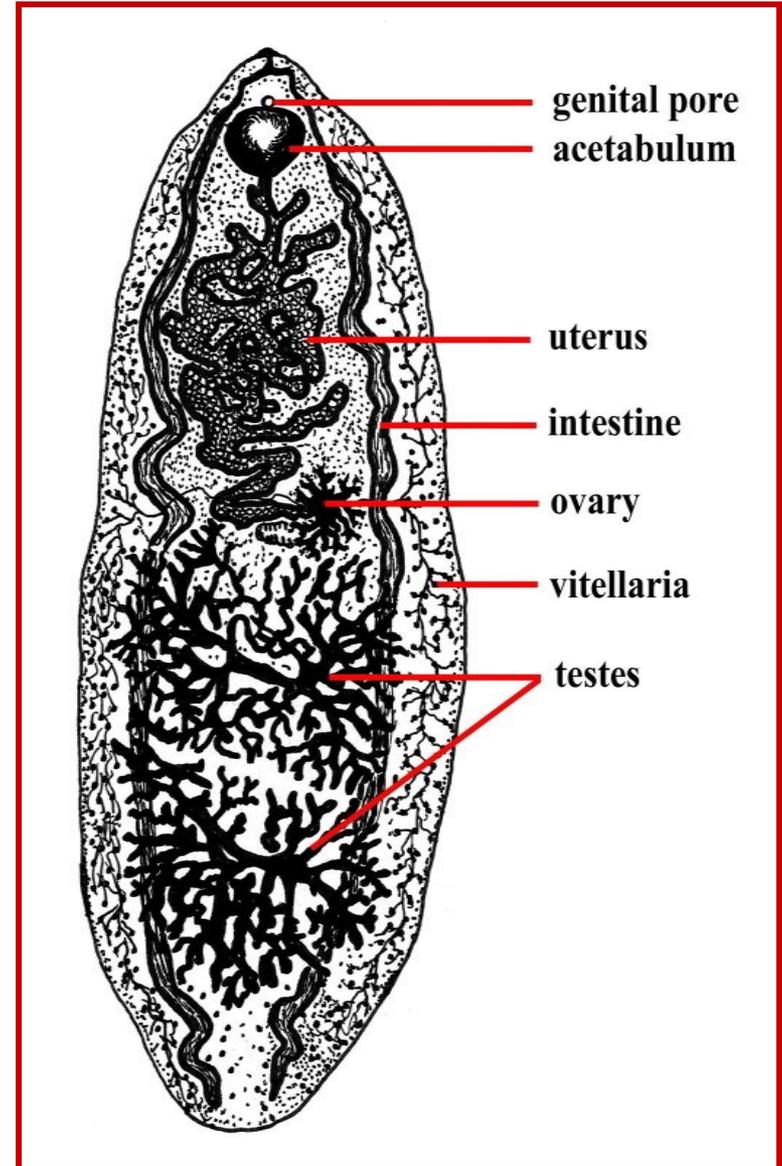
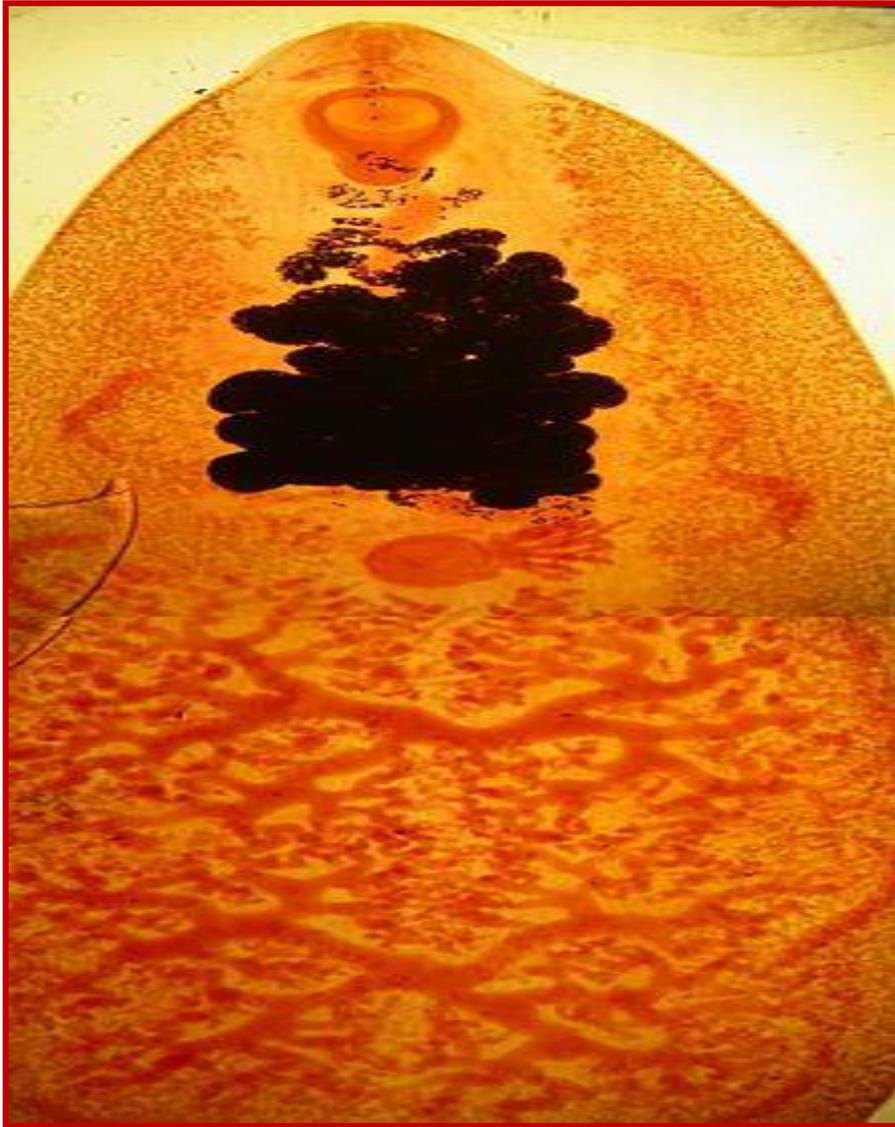
❖ **D.H**: Man & Pigs.

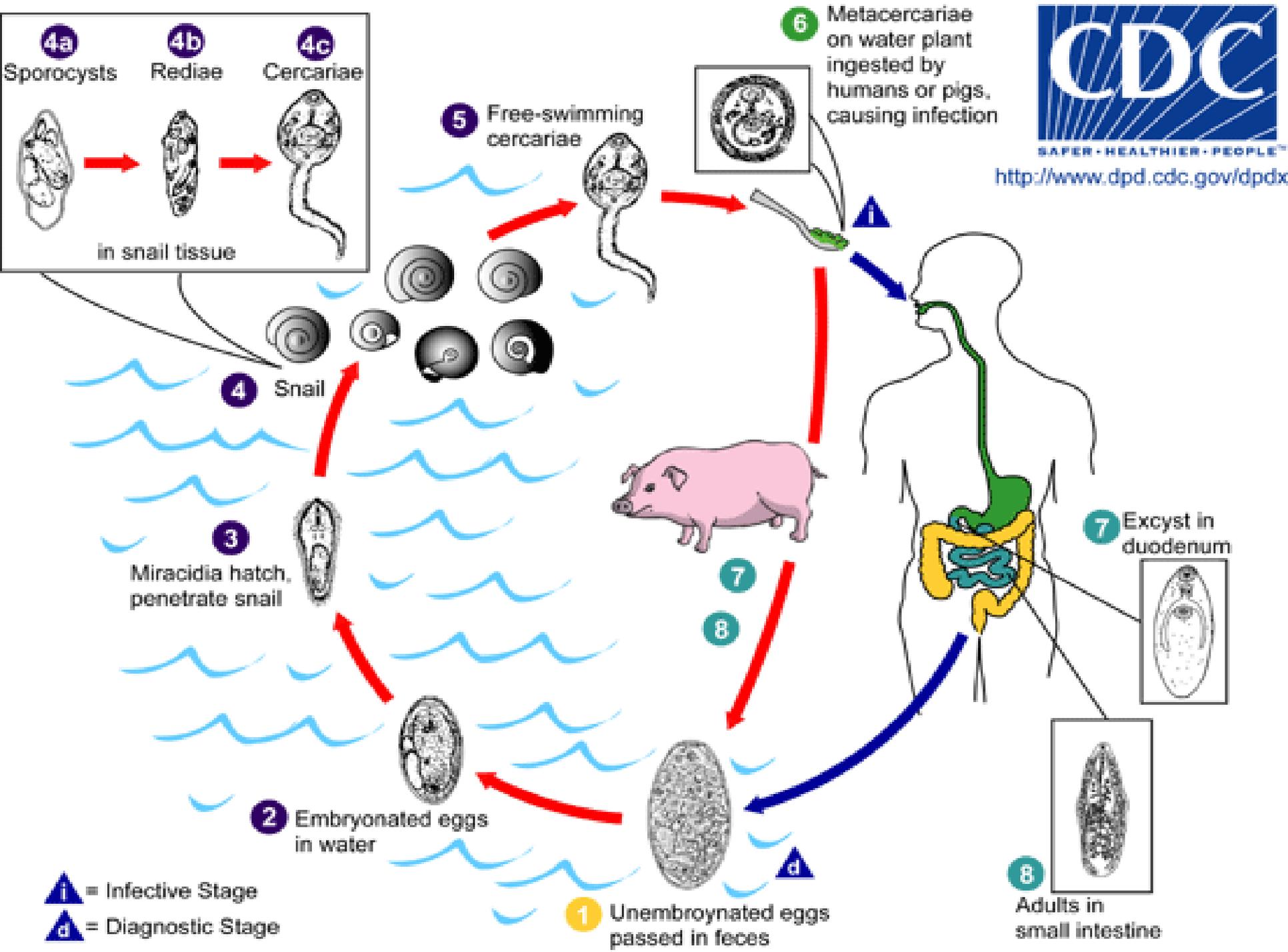
❖ **R.H**: Pigs .

❖ **I.H** : Segmentina (fresh water snail).

❖ **Disease**: Fasciolopsiasis

Morphological characters





❖ **I.H: *Segmentina* snail.**

(miracidium → sporocyst → redia
→ cercaria (leptocercous cercaria).

❖ **Encysted metacercaria (I.S):**

encysted on water plants & in
water.



❖ **Mode of infection:**

1- Ingestion of water plants infected with encysted metacercaria.

2- Drinking water contaminated with encysted metacercaria.

Pathogenesis & symptomatology

- ❖ **Adult worm causes traumatic, mechanical & toxic effects. Ulceration & abscess formation occurs due to its attachment to the intestinal mucosa by the ventral sucker.**
- ❖ **Clinical pictures:**
 - **Symptoms depend on the parasitic load:**
 - 1- **Light infection** are asymptomatic.
 - 2- **Moderate infection** may presented by abdominal pain, nausea & vomiting especially in the morning.
 - 3- **Heavy infection** causes fever, severe abdominal pain, **bloody diarrhea**, malabsorption, protein losing enteropathy, generalized oedema, anaemia & partial intestinal obstruction.

Diagnosis

1- Clinically.

2- Laboratory:

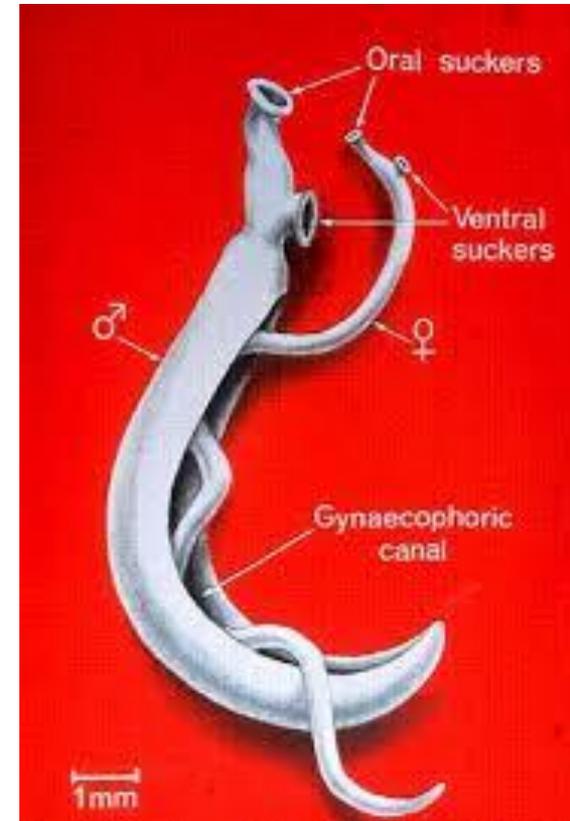
Stool examination to detect eggs.

Treatment

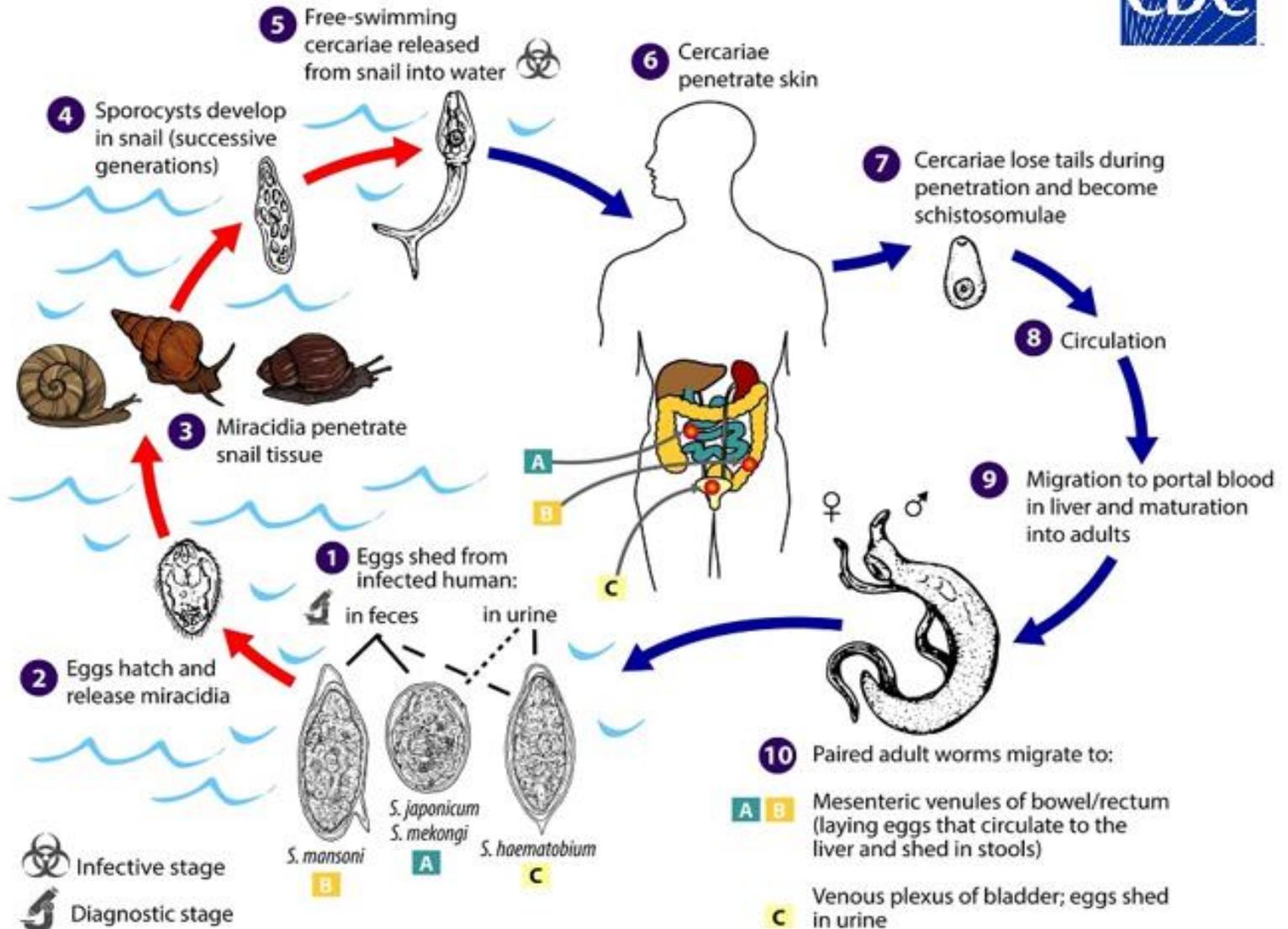
Praziquantel is the drug of choice.

Schistosoma

- A genus of Trematodes, *Schistosoma*, commonly known as **blood-fluke**, are parasitic flatworms responsible for a highly significant group of infections in humans termed **schistosomiasis**.
- Schistosomiasis is considered by the World Health Organization as the second most socioeconomically devastating parasitic disease, (after malaria), with hundreds of millions infected in a worldwide.



Schistosoma spp.



Schistosoma

Feature	S. mansoni	S. haematobium	S. japonicum
Geography	Africa, S. America, Middle East	Africa, Middle East	East Asia (China, Philippines)
Egg shape / Spine	Oval, lateral spine	Oval, terminal spine	Round/oval, small lateral spine (difficult to see)
Adult location	Mesenteric veins of large intestine	Venous plexus of bladder	Mesenteric veins of small intestine
Main symptoms	Portal hypertension, diarrhea, bloody stool	Hematuria, dysuria	Similar to mansoni but more severe hepatosplenic disease
Complications	Hepatosplenomegaly, periportal fibrosis	Squamous cell carcinoma of bladder, hydronephrosis	Severe liver disease, risk of cerebral granulomas
Transmission	Cercariae from freshwater snails penetrate skin	Same	Same
Diagnosis	Eggs in stool	Eggs in urine	Eggs in stool
Treatment	Praziquantel	Praziquantel	Praziquantel

F luke = Flat leaf-shaped parasite that needs water & snails”

- Flat
- Leaf-shaped
- Usually hermaphrodites (except *Schistosoma*)
- Keep snails as intermediate host
- Environment = fresh water

Mnemonic: “F-L-U-K-E-S”

- Fever
 - Larval migration pain
 - Upset stomach (GI symptoms)
 - Konstant eosinophilia (Eo↑)
 - Edema (local or organ-specific)
 - Swelling of involved organ
- 👉 Use this for ANY fluke infection.