Trematodes (Fasciola gigantica & Fasciolopsis busci)

Lecture 20

General Microbiology

2nd year student

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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.**

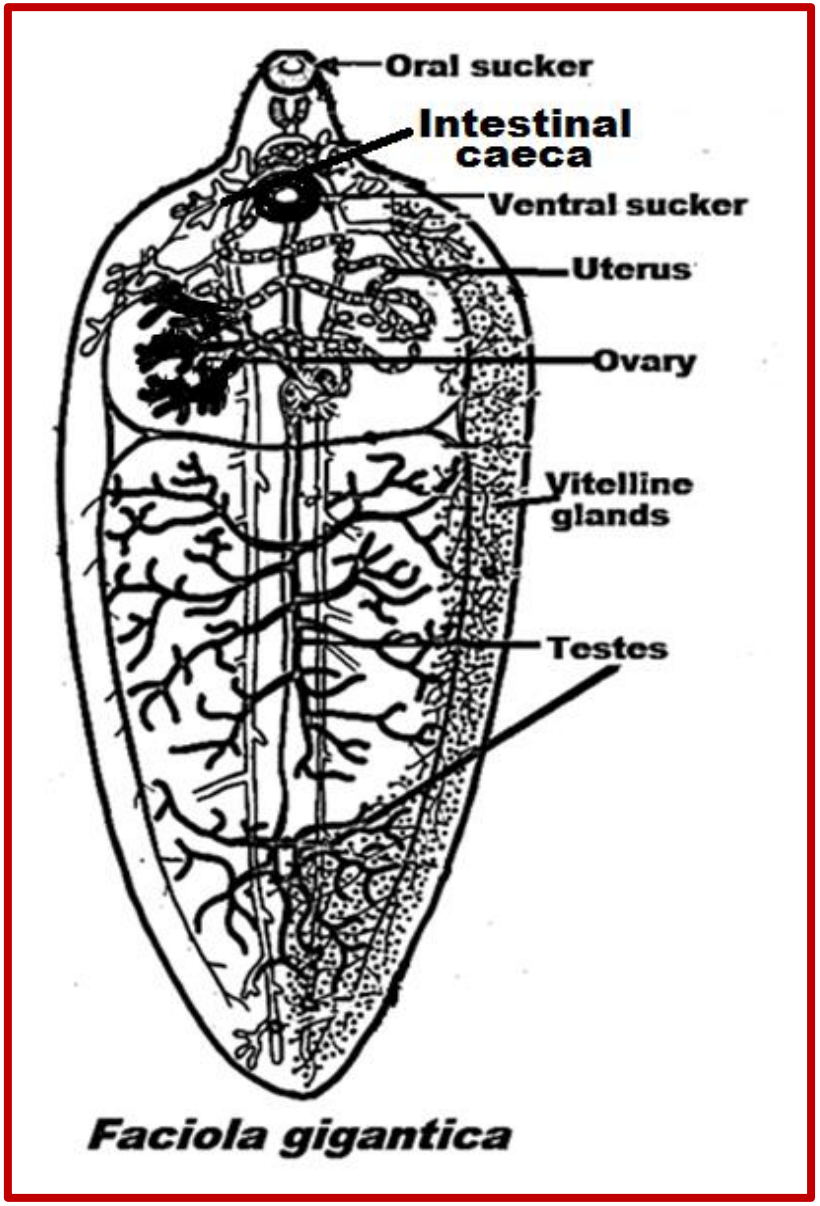
❖**Habitat : Bile ducts in liver.**

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

❖**I.H : Snail (*Lymnaea cailliaudi*).**

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

Adult *Fasciola gigantica*



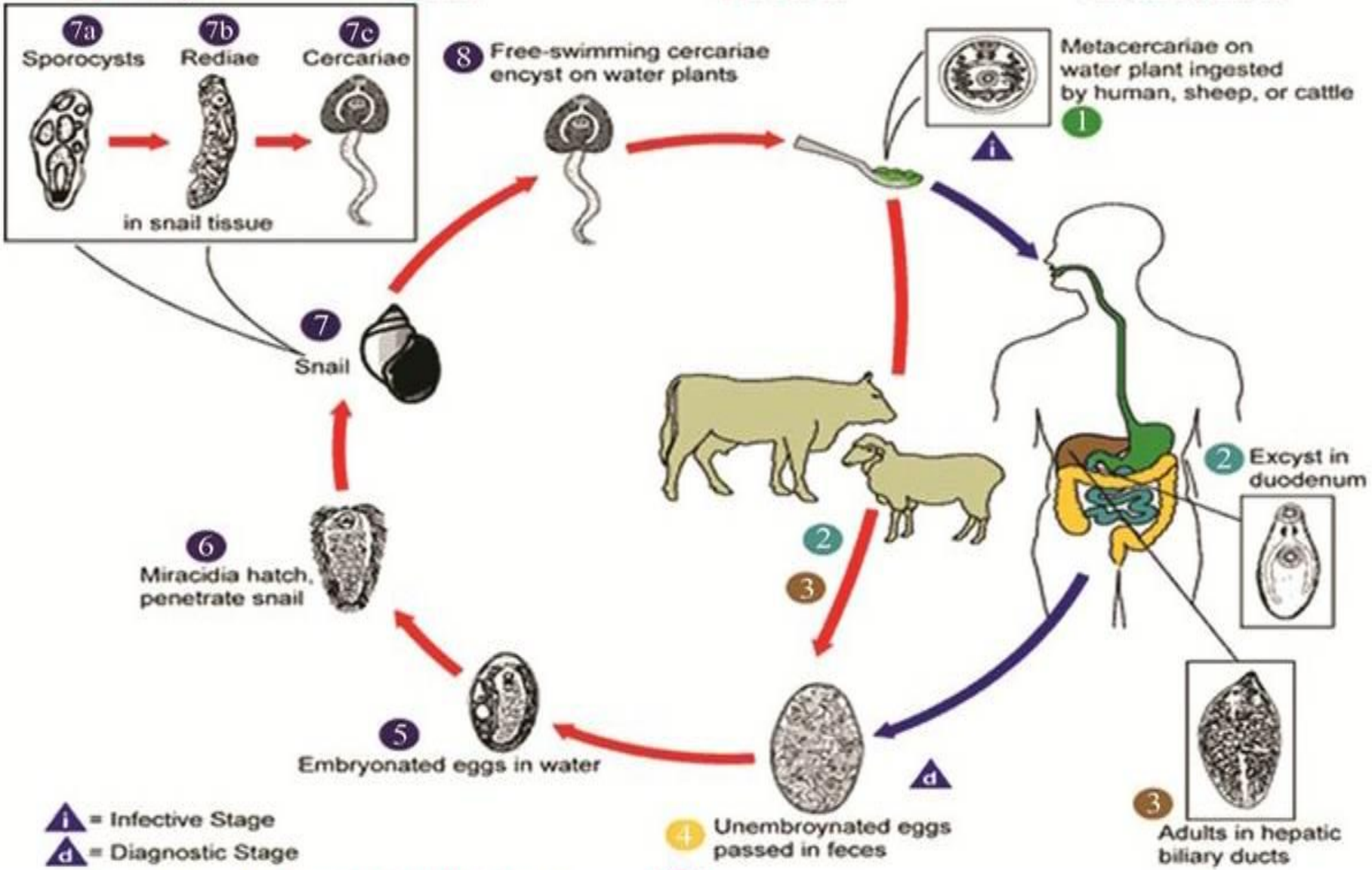
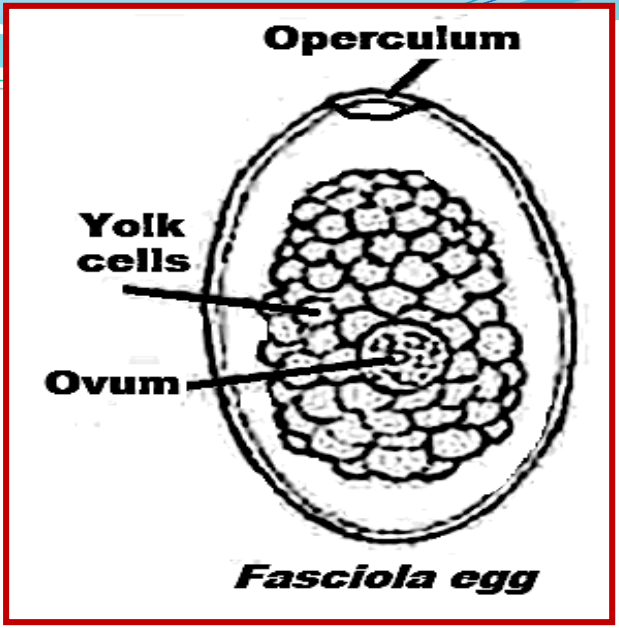


Fig. (2 - 9) *Fasciola* life cycle

❖Egg (D.S):-

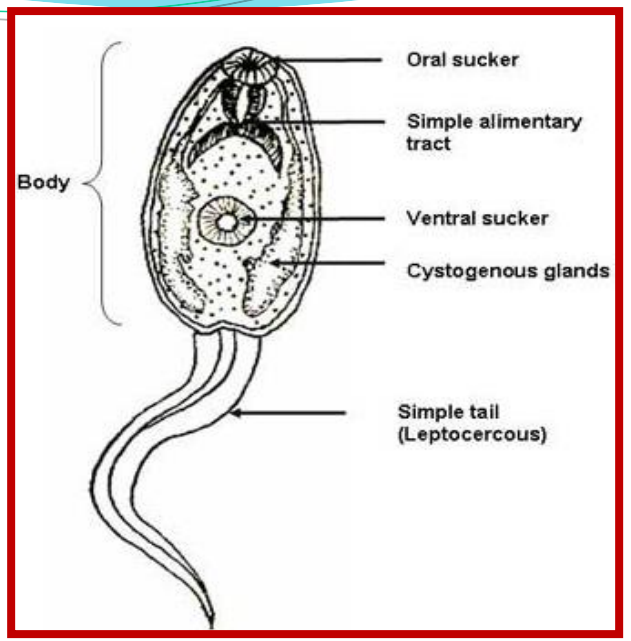
- **Size : 140 x 70 µm.**
- **Shape : Oval.**
- **Shell : Thin operculated.**
- **Color : Yellowish brown.**
- **Content : Immature (ovum & yolk cells).**



❖Miracidium, Sporocyst & Redia:-

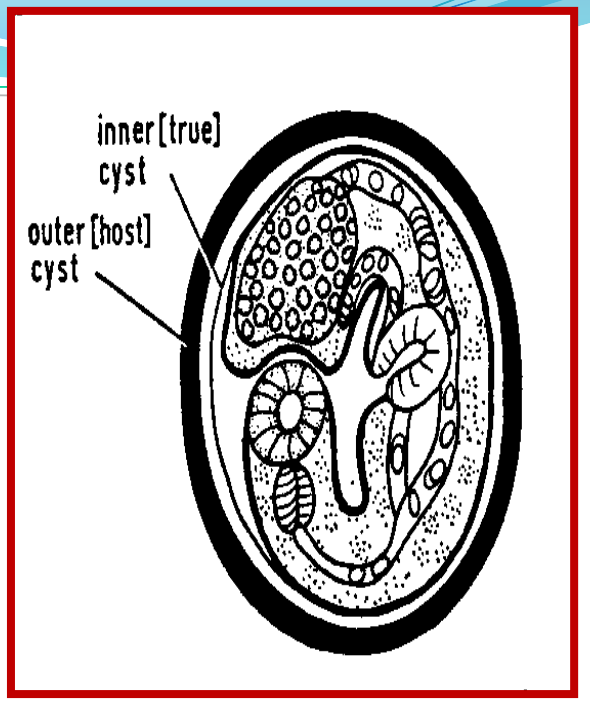
❖Cercaria:-

- Formed of body and tail.
- Body with oral and ventral suckers, simple intestinal caeca.
- Tail



❖Encysted metacercaria (I.S):-

- Spherical in shape.
- The cercaria losses its tail and secrete a thick cyst wall.
- Present in green aquatic vegetations and water.



❖Mode of infection:

1- Ingestion of water plants infected with encysted metacercaria.

2- Drinking water contaminated with encysted metacercaria.

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 ^{o}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 eosinphilia.

❖**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.

Fsciolopsis 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.**

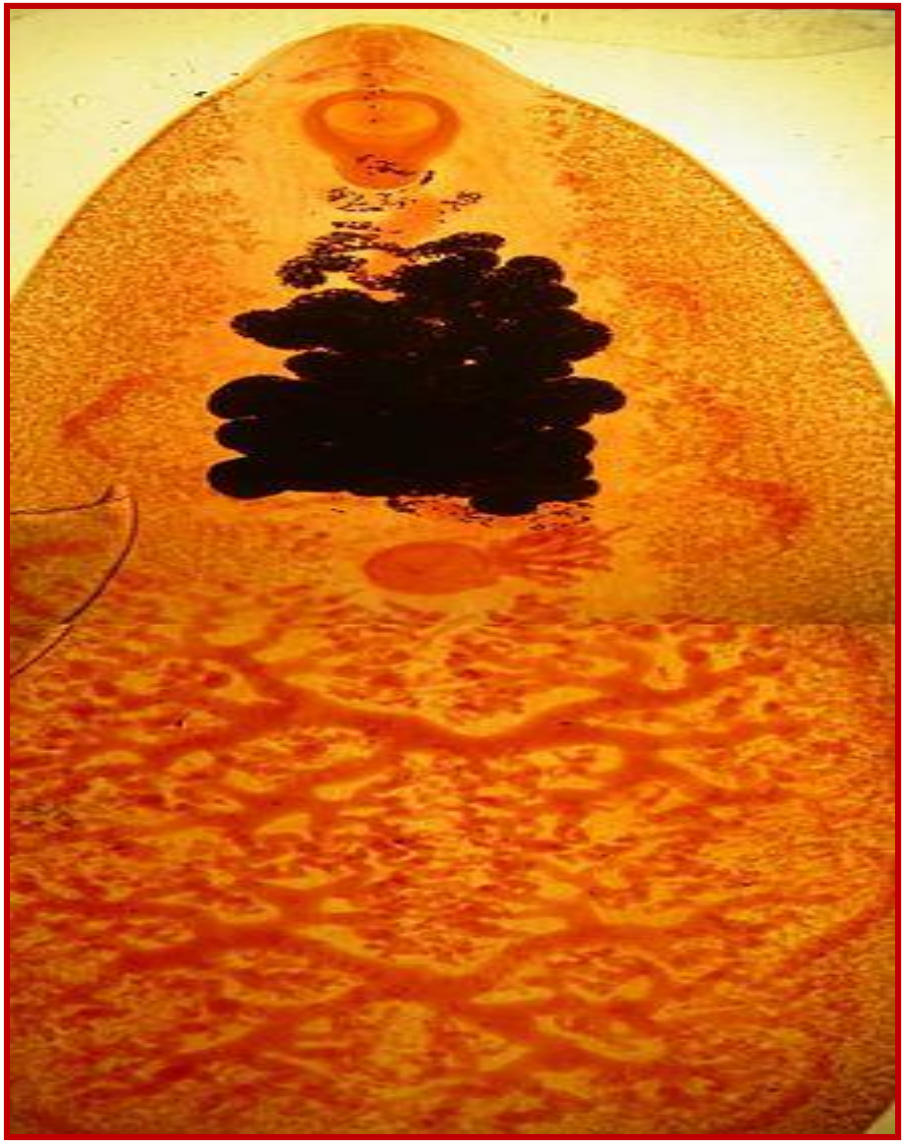
❖**D.H: Man & Pigs.**

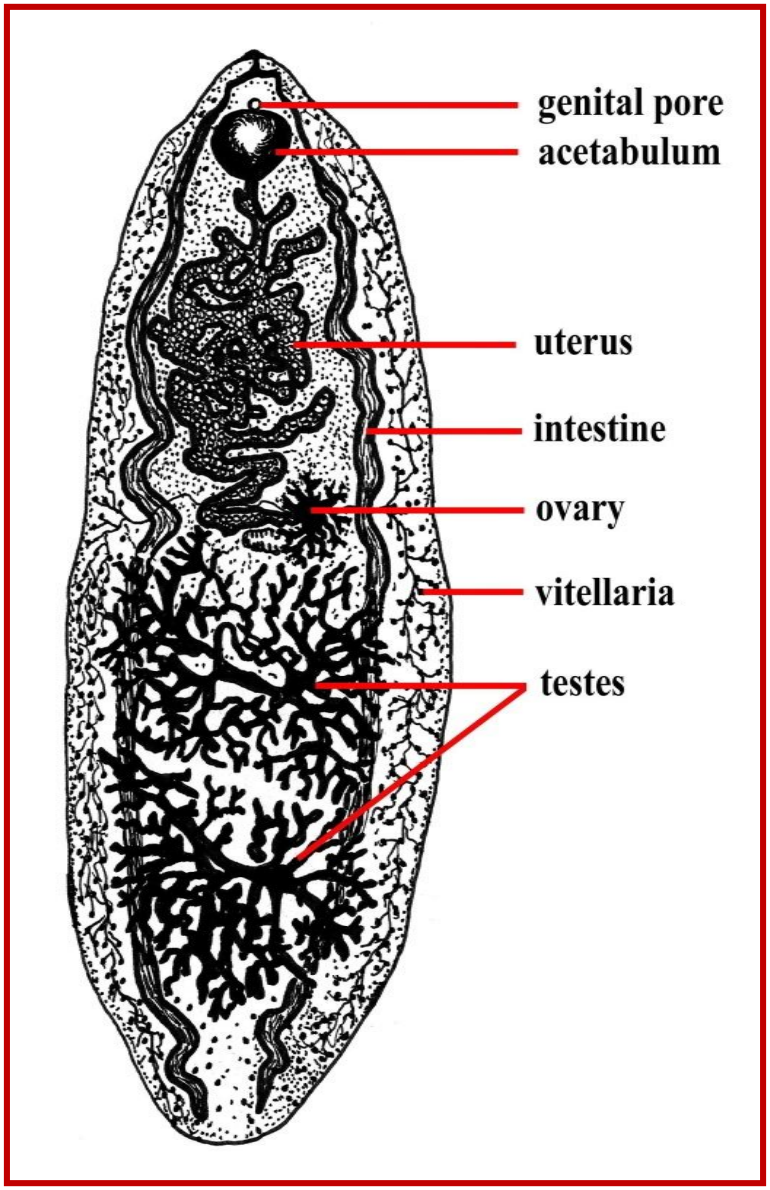
❖ **R.H: Pigs .**

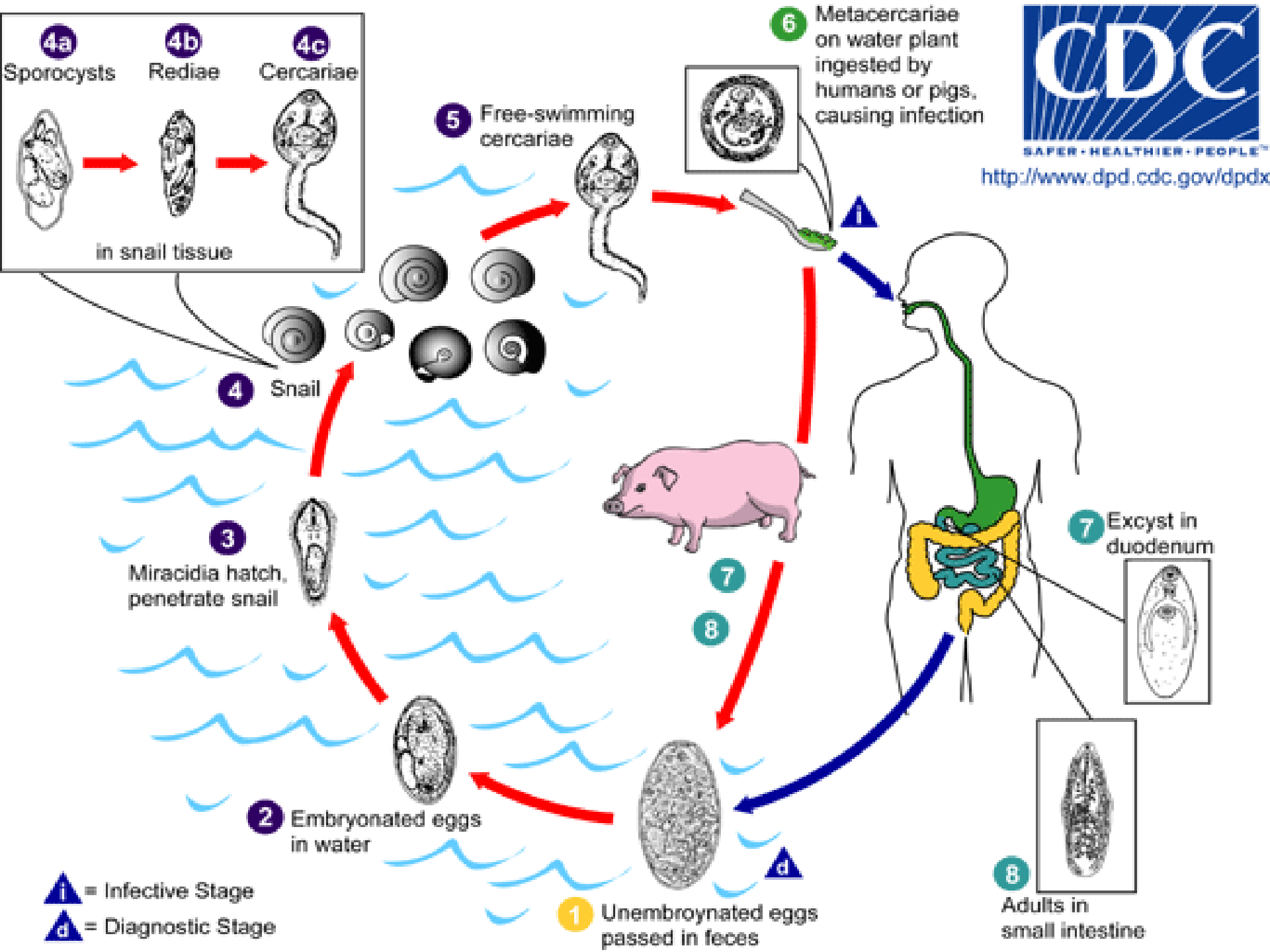
❖**I.H : Segmentina (fresh water snail).**

❖**Disease: Fasciolopsiasis**

Morphological characters






4a
Sporocysts
4b
Rediae
4c
Cercariae
in snail tissue
5 Free-swimming cercariae
6 Metacercariae on water plant ingested by humans or pigs, causing infection
CDC
SAFER · HEALTHIER · PEOPLE™
http://www.dpd.cdc.gov/dpdx
i
4 Snail
3 Miracidia hatch, penetrate snail
7
8
7 Excyst in duodenum
2 Embryonated eggs in water
d
1 Unembroynated eggs passed in feces
8 Adults in small intestine
i = Infective Stage
d = Diagnostic Stage

❖Egg (D.S):-

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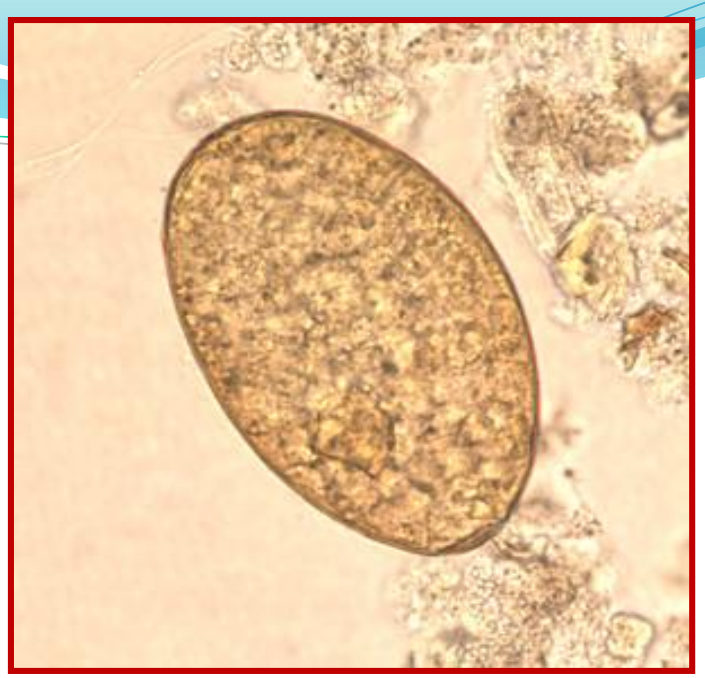
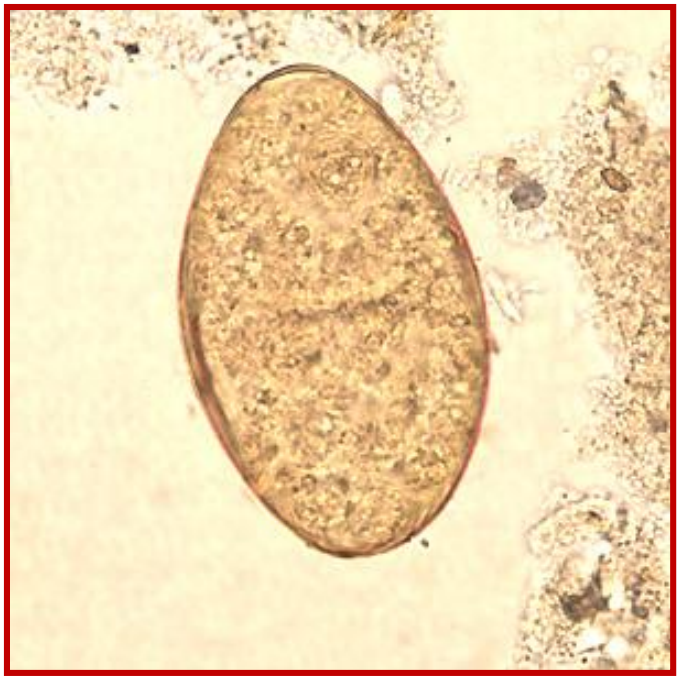


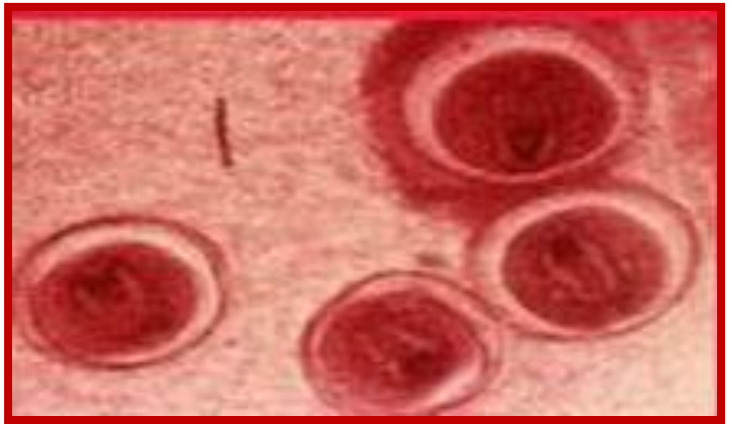


❖**I.H: *Segmentina* snail.**

(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.