

MUSEUM COLLECTION

PLATYHELMINTHES

Specimens & Permanent slides

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Phylum Platyhelminthes

Class 1 Turbellaria
(*turbella* = a string)
Eg. *Dugesia*, *Bipalium*

Class 2 Trematoda
(*Trema*=hole, *eidos*=form)
E.g. *Fasciola hepatica*,

Class 3 Cestoda
(*Ketos*, girdle+ *eidos*,form)
E.g. *Taenia solium*,

Phylum Nematelminthes

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graph TD; A[Phylum Nematelminthes] --> B[Class 1: Aphasmidia or Adenomorpha]; A --> C[Class 2: Phasmidia or Secernentea];
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**Class 1: Aphasmidia or
Adenomorpha**

E.g. Enoplus, Mermis

**Class 2: Phasmidia or
Secernentea**

***E.g. Trichuris, Oxyuris,
Enterobius, Ascaris,
Wucheria, Ancylostoma***

Phylum - Platyhelminthes

Class I : Turbellaria

Turbella= a stirring

- Non-parasitic and Free living worms c/d planarians
- Marine or terrestrial
- Body unsegmented flattened and covered with cilia
- Mouth ventral
- Sucker absent
- Mostly hermaphrodite
- Can reproduce asexually

Class II : Trematoda

(Tremta, hole + eidos, form)

- Ecto or endoparasitic flat worms c/d flukes
 - Body unsegmented, dorso-ventrally flattened (leaf like)
 - Suckers and sometimes hooks present
 - Alimentary canal with anterior mouth, simple pharynx and two main branches
 - Mostly monoecious.
- Development indirect or direct

Class III : Cestoda

(Ketos, girdle+ eidos, form)

- Endoparasitic flatworms c/d tapeworms
- Body segmented, elongate, flat, ribbon like
- Tegument with microvilli
- Scolex (head) with suckers, or hooks, or both
- Alimentary canal and sense organs absent
- Each mature segment or proglottid monoecious, with male and female organs
- One or more intermediate host

PLATYHELMINTHES

General features

1. Flatworms are dorso-ventrally flattened
2. Triploblastic, Bilateral symmetrical acoelomates with blind sac body plan and organ grade of body organisation.
3. Body unsegmented (except in class Cestoda)
4. Primitive eumetazoans are without definite anus, circulatory system and respiratory system
5. **Digestive system** branched and incomplete without anus. Although absent in cestoda
6. **Nervous system** : primitive, ladder-like comprises a pair of anterior ganglia with longitudinal nerve cords connected by transverse nerves.
7. **Sense organ**: simple, eyes-spot or photo-receptors in free living forms
8. Great variety of adhesive secretion, organs of attachment and adhesion(hooks and suckers) are present
9. Have **protonephridial** (flame cells) excretory system
10. Exoskeleton and endoskeleton absent but body has hard part like spines, hooks n teeth
11. Sexes are mostly united- **hermaphrodite**
12. Fertilization internal, may be cross or self.

Fasciola hepatica

Common name –Common liver fluke/ Sheep liver fluke

Geographical Distribution: It is found in parts of Latin America, the Caribbean, Europe, the Middle East, Africa, Asia, and Oceania.

Scientific Classification

Kingdom: Animalia (Multicellular, eukaryotic, heterotrophic)

Phylum: Platyhelminthes (simple bilaterian, unsegmented, soft-bodied invertebrates.)

Class: Trematoda (Hole forming flat worms)

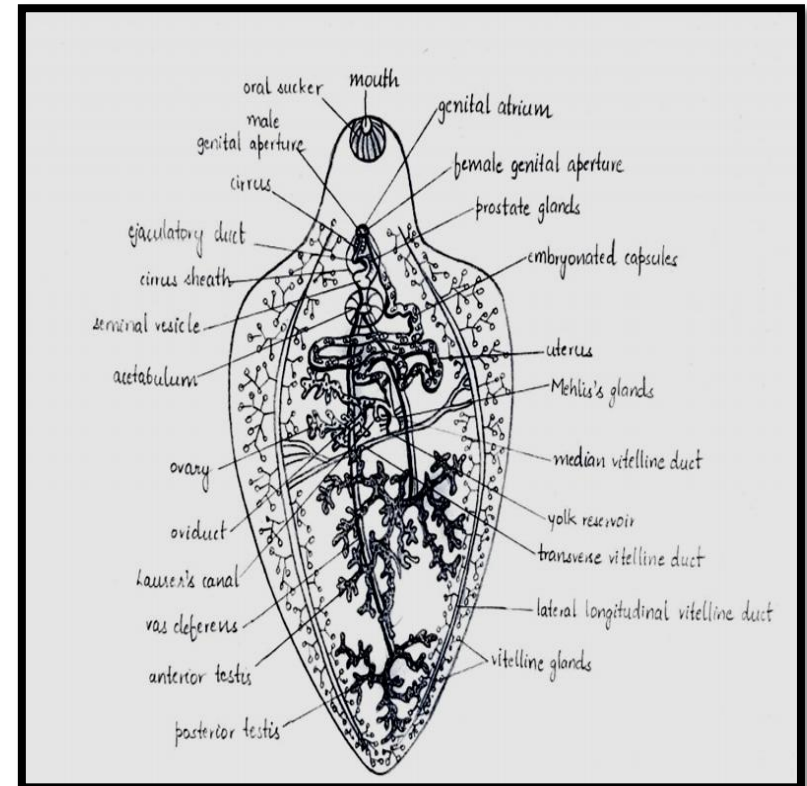
Genus : *Fasciola*

Species : *hepatica*

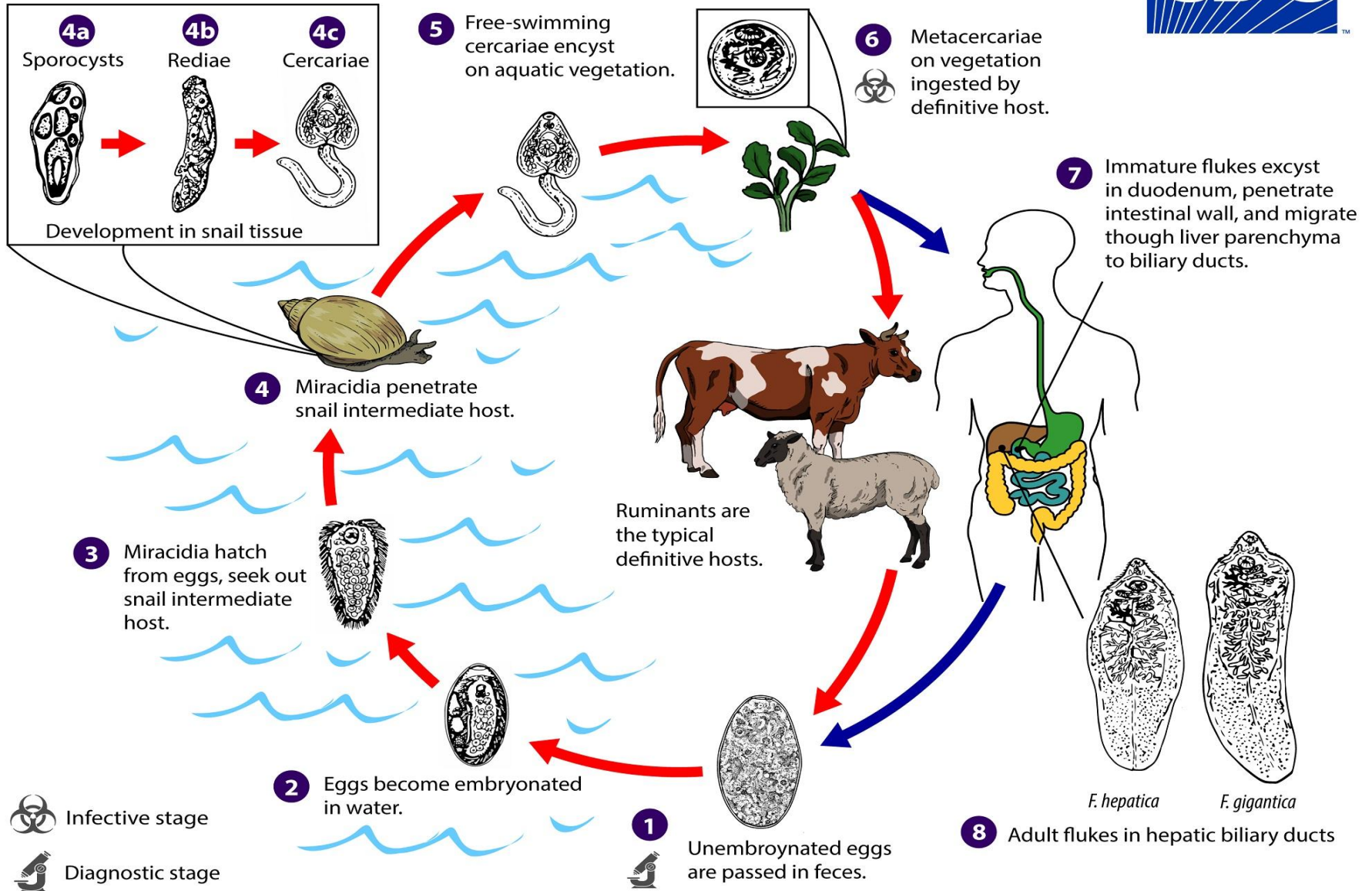


General features:

1. *Fasciola hepatica* infects numerous mammals, especially cows, sheep and other ruminants including humans
2. The egg capsules are passed via bile to the small intestine, travel through the large intestine to ultimately be deposited into the environment through faeces.
3. feces deposited in water, the egg capsules will embryonate and in about 9-10 days in warm weather, hatch, liberating the miracidium.
4. This ciliated, non-feeding larvae will seek out snails of *Stagnicola bulimoides* or *Fossaria modicella* in the US but other related snails in other parts of the world.
5. Within the snail host, the miracidium transforms into a sporocyst which in turn produces redia known as mother redia since they will produce daughter redia.



Fasciola hepatica

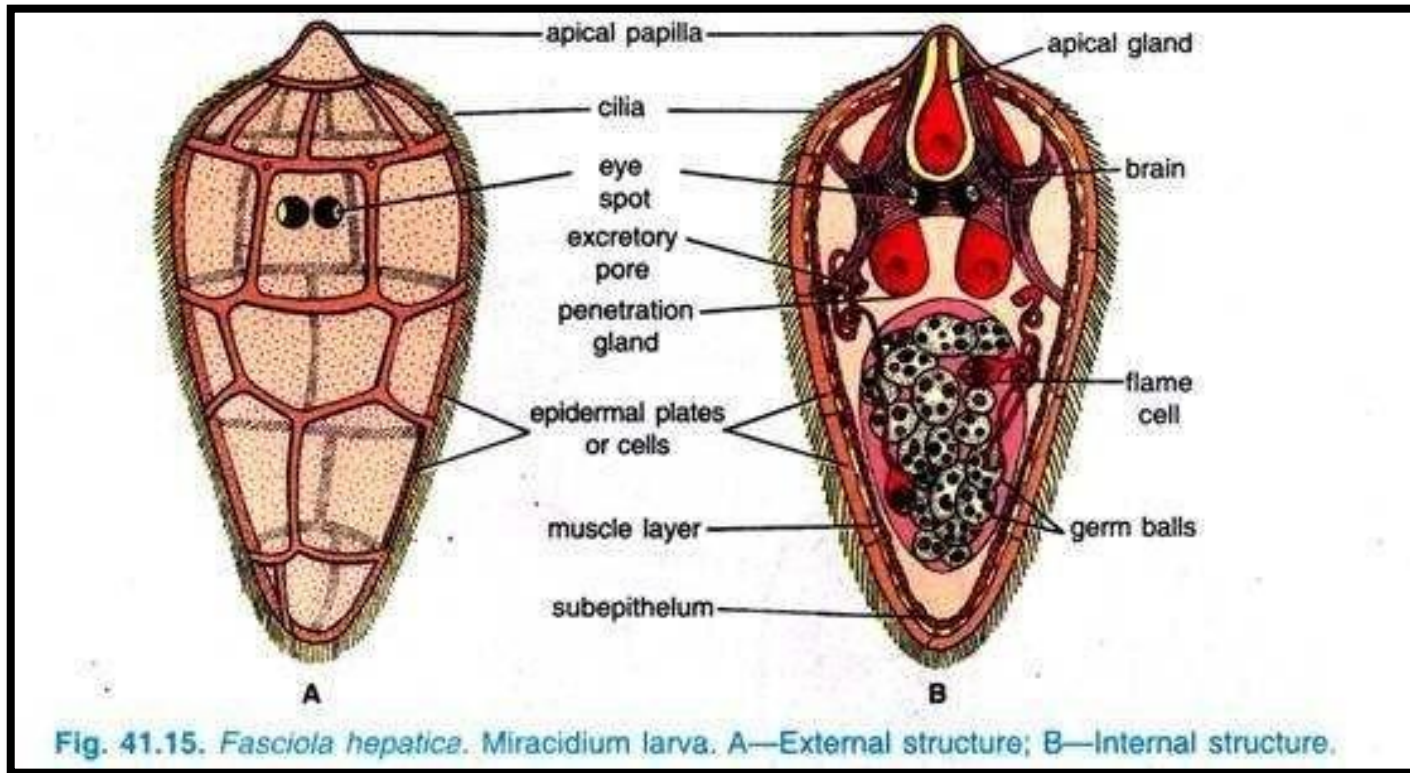


MIRACIDIUM LARVA

General features:

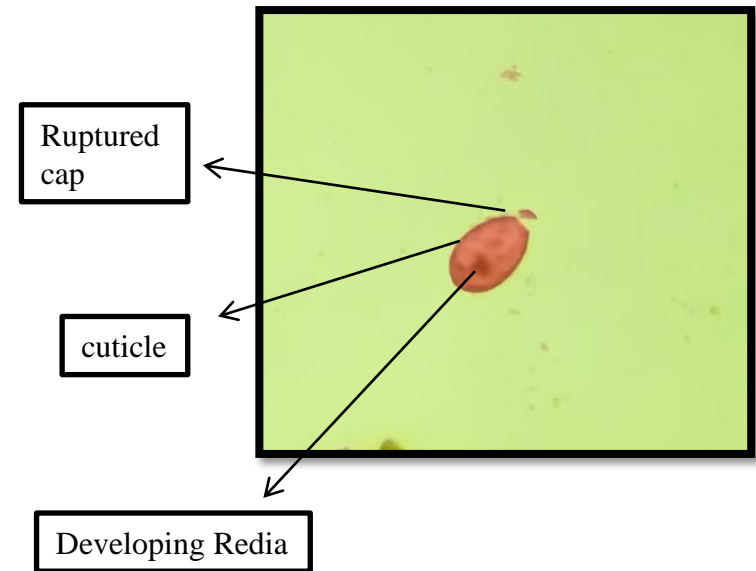
1. The first larval stage of trematode worms (flukes), which hatches from eggs excreted in the feces of the primary host.
2. It is a minute, oval and elongated, free-swimming stage, it is covered with 18 to 21 flat ciliated epidermal cells lying in five rings.
3. Anteriorly it has a conical apical papilla, and attached to it is a glandular sac with an opening called **apical gland**.
4. On each side of the apical gland is a bag-like **penetration gland**, two pigmented X-shaped eye spots and a nervous system.
5. The miracidium *does not feed*, it swims about eight hours in water unless it finds a suitable intermediate host, which is some species of amphibious snail of genus *Limnaea* or even *Bulinus* or *Planorbis*.
6. After getting a suitable host the miracidium adheres to it by its apical papilla and enters the pulmonary sac of the snail, from where it penetrates into the body tissues and finally reaches to snail's digestive gland.

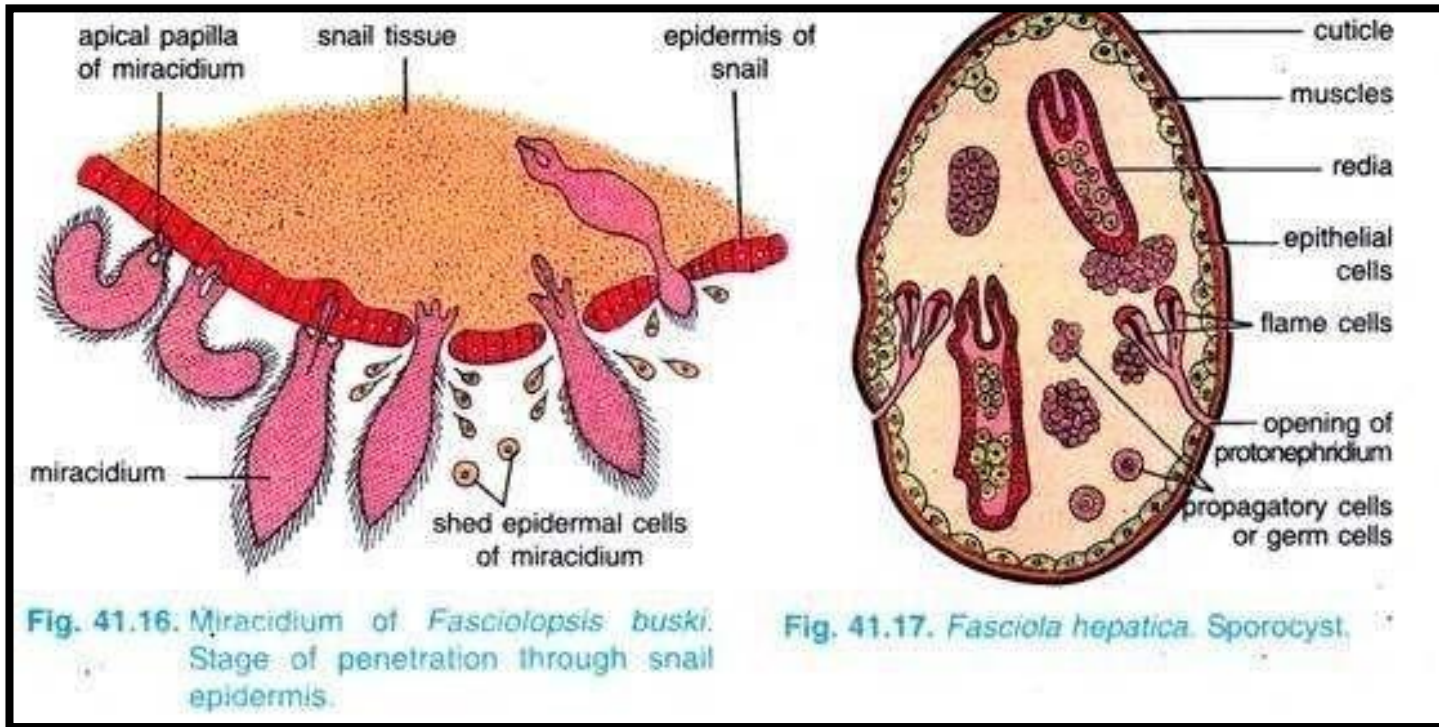




SPOROCCYST

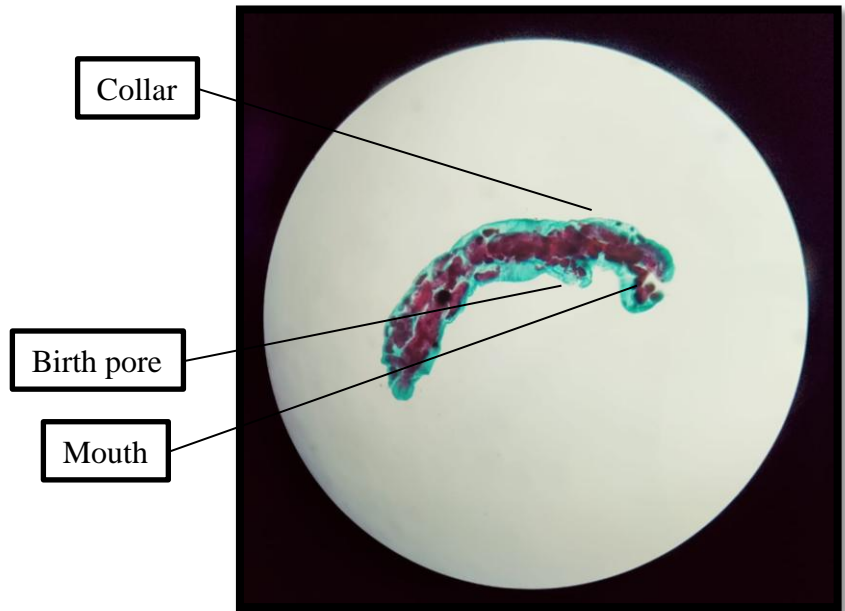
1. The sporocyst is an elongated germinal sac about 0.7 mm long and covered with a thin cuticle. The glands, nerve tissue, apical papilla and eye spots of miracidium disappear.
2. The hollow interior of sporocyst has a pair of protonephridia each with two flame cells it has germ cells and germ balls.
3. The germ cells have descended in a direct line from the original ovum from the miracidium developed.
4. The sporocyst moves about in the host tissues and its germ cells develop into a third type of larva called redia larva.
5. A sporocyst forms 5 to 8 rediae.
6. The rediae larvae pass out of the sporocyst by rupture of its body wall into the snail tissues with the aid of the muscular collar and ventral processes, then the rediae migrate to the liver of the snail.

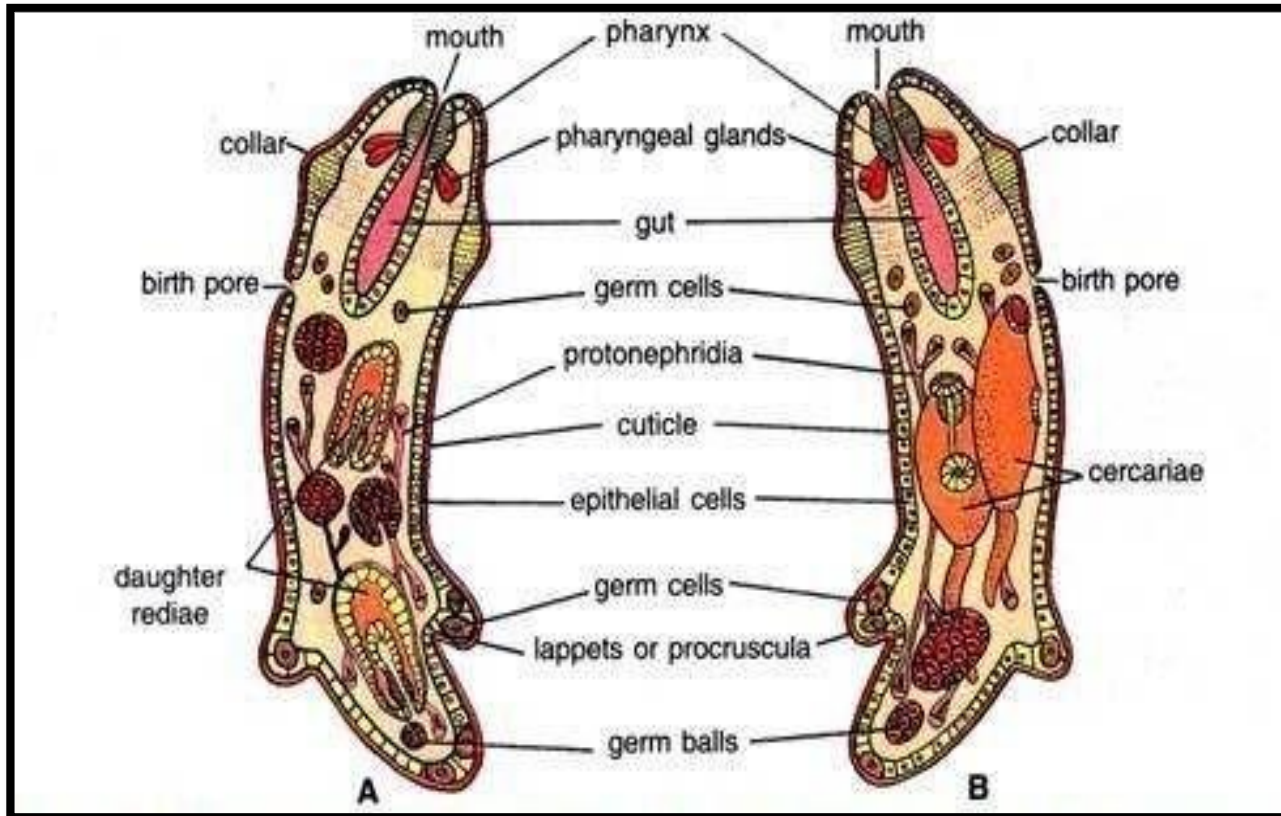




REDIA LARVA

1. Redia is an elongated larva with a small mouth, a suctorial pharynx and a simple closed intestine in the anterior part of the body
2. Many unicellular pharyngeal glands open into the pharynx. These are a muscular, ring-like ridge, the collar, around the anterior region of the body. It helps in locomotion.
3. It nourishes itself by sucking fluid and cells of the host tissues with its muscular pharynx
4. Just behind the collar is a birth pore through which next generation of larvae come out.
5. On the posterior region there is a pair of lobe-like processes, the lappets or procruscla. These are used as an anchor.



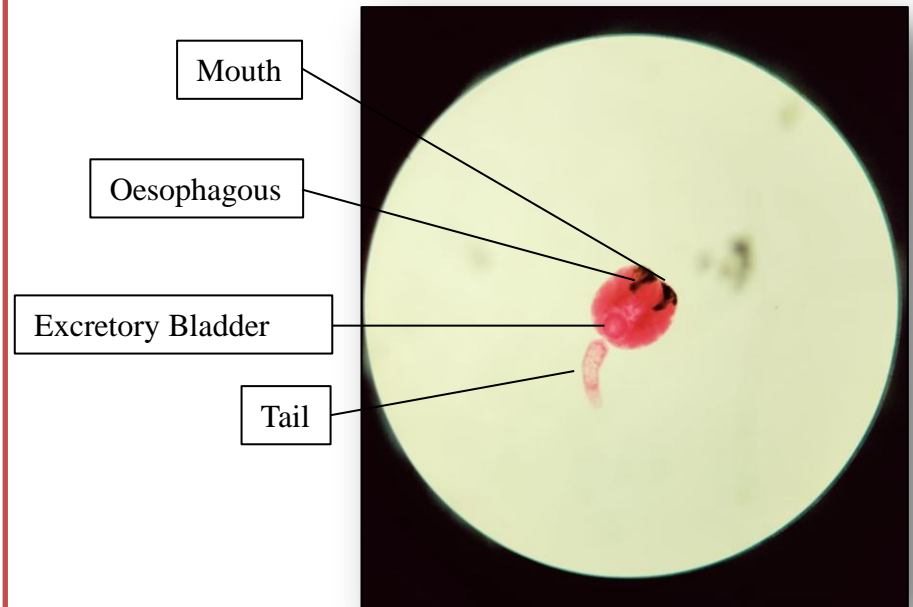


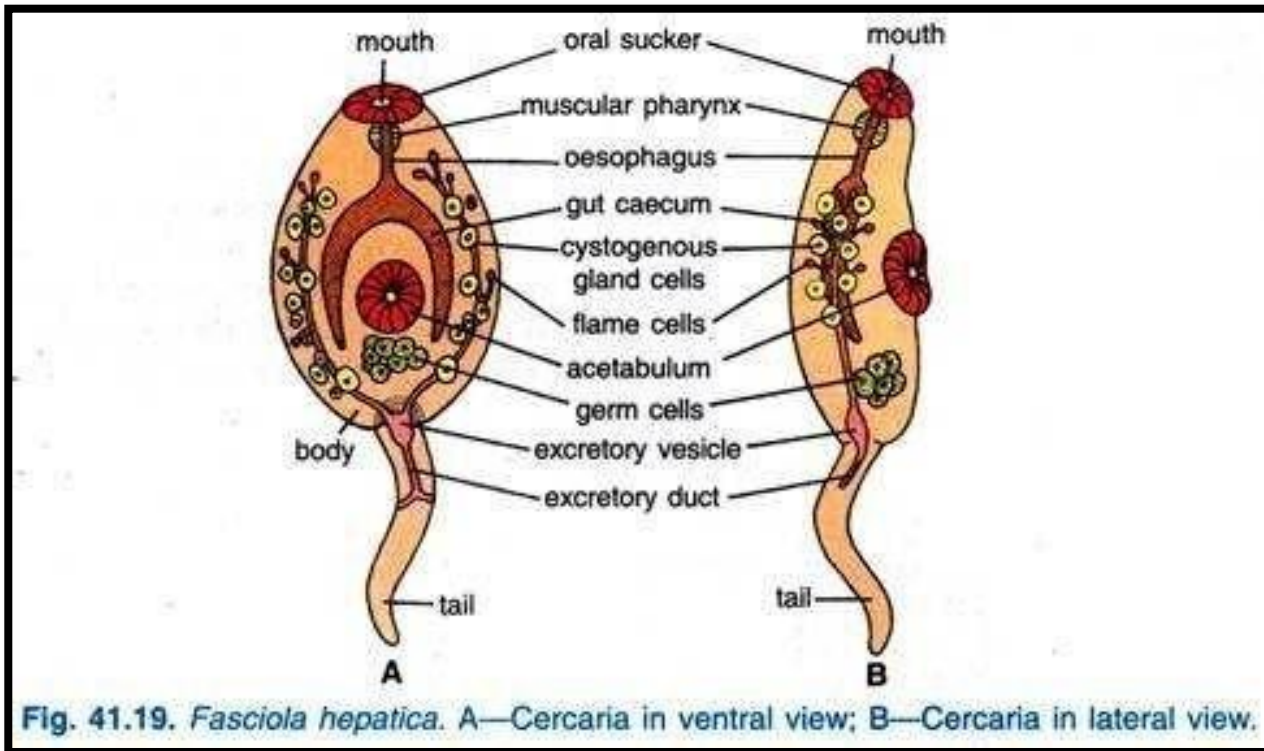
<https://zilms.com/life-history-of-fasciola-hepatica/>

CERCARIA LARVA

General features

1. Cercaria has a long tail and oral and ventral sucker.
2. Alimentary canal is well developed and consists of mouth, pharynx, and bifurcated intestine.
3. Paired excretory tubules with flame cells, germ cells, and peripheral cyst forming cells are also present.
4. Cercaria comes out of the body of the snail, swims for some time and then climbs on grass leaves where it becomes encysted, and is called metacercaria.





<https://zilms.com/life-history-of-fasciola-hepatica/>

TAENIA SOLIUM

Common Name: Pork tapeworm

Geographical distribution: It is limited to Asia and is seen mostly in the Republic of Korea, China, Taiwan, Indonesia, and Thailand.

Scientific Classification

Kingdom: *Animalia* (Multicellular, eukaryotic, heterotrophic)

Phylum: *Platyhelminthes* (simple bilaterian, unsegmented, soft-bodied invertebrates)

Class: *Cestoda* (body segmented, elongate, flat, ribbon like)

Genus: *Taenia*

Species: *solium*



TAENIA SOLIUM

1. Commonly known as **Pork tapeworm**
2. Taenia is a digenetic parasite.
3. Organ level of body organization, Triploblastic, Acoelomate
4. Man is the primary or definitive host, the secondary host for *T.solium* is pig.
5. The body is elongated, dorso-ventrally flattened and ribbon-like.
6. It is also called tapeworm as the shape of the body is like a tape.
7. The size of adult worm varies from 3-5 metres i.e., 9-16 feet, but few are recorded to attain a length of about 8 metres.
8. Segmented body
9. Intestine is completely absent.
10. Body is covered by tegument
11. The body is opaque white but may be grey, yellow or creamy.
12. The body of Taenia is modified for parasitic (exclusively endoparasite) mode of life.

