

REPRODUCTIVE SYSTEM -

MALE REPRODUCTIVE ORGANS -

(i) Testis → These are two in number profusely branched and are placed in tandem arrangement. The cells present in the wall of the testis give rise to spermatozoa.

(ii) Vasa deferentia → Each testis gives rise to a narrow and cylindrical sperm duct known as the vasa deferentia. It runs anteriorly.

(iii) Seminal vesicles → The two vasa deferentia unite together in the middle region near the ventral sucker and form a common sac like structure known as the seminal vesicles or vesicular seminalis. It serves as the organ of storage of sperm.

(iv) Ejaculatory duct → From the seminal vesicles originates a narrow and coiled duct known as the ejaculatory duct. It is stout and muscular structure which opens as a male genital opening situated in a common genital atrium. The end or terminal structure of the ejaculatory duct is known as the cirrus.

(v) Cirrus sheath → The cirrus, seminal vesicles and prostate glands are enclosed within a sheath known as the cirrus sheath.

(vi) Genital atrium → It is common chamber in which the male and female genital aperture open. It finally opens to the

exterior through a medium gonopore lying anterior to the acetabulum.

FEMALE REPRODUCTIVE ORGANS —

- (i) Ovary → It is a branched tubular organ lying a little anterior in the right side of the right testis.
- (ii) Oviduct → The duct originating from the ovary is called oviduct which is short and narrow and it opens in the ootype.
- (iii) Uterus → It is a wide and coiled tube originating from the junction of the oviduct and vitelline duct. It opens in the common genital atrium in the form of female genital aperture.
- (iv) Vitelline glands and its ducts → Throughout the lateral zones of the body are scattered numerous follicular structures known as vitellaria or yolk glands or vitelline gland. On each lateral side of the body there is a longitudinal vitelline duct. The two longitudinal ducts are united by a transverse vitelline duct.
- (v) Mehlis's duct → Around the ootype are numerous unicellular glands known as the Mehlis's gland or shell gland.
- (vi) Lawrence's canal → During the breeding season a tube originates from the oviduct and leads vertically upwards. It is known as the Lawrence's canal, which opens to the exterior on the dorsal side of the

body through a temporary opening known as opening of Laurer's canal.



LIFE CYCLE — In the life cycle of Fasciola hepatica two hosts are required — sheep as the definitive host and snail as the intermediate host. The life cycle starts with laying eggs.

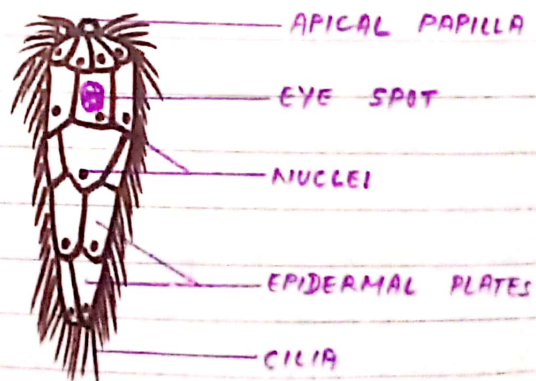
STRUCTURE OF EGGS —

- (i) The shape is oval and it is provided with an operculum.
- (ii) The eggs measure 140 μm by 80 μm .
- (iii) An unsegmented ovum surrounded by yolk cells is present.
- (iv) The eggs which are laid down specially in the aquatic medium they develop further. During the course of development the miracidium larva is developed first.

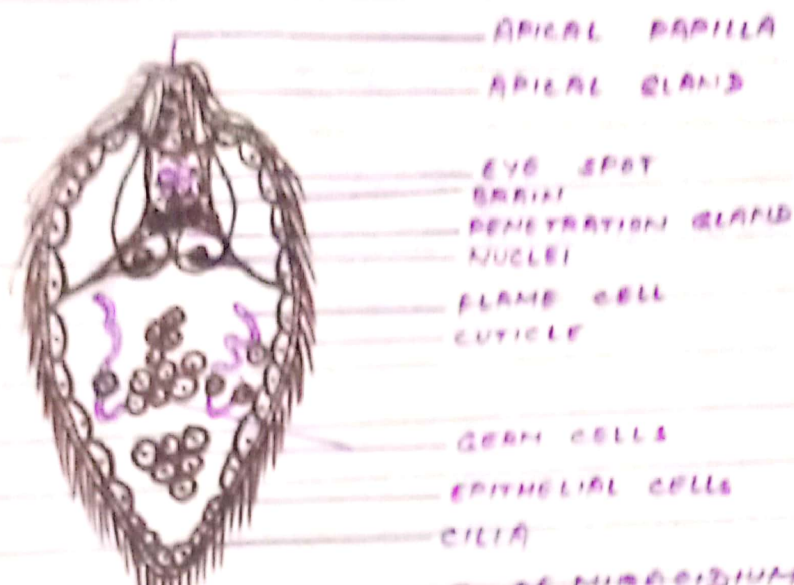
aquatic medium operculum becomes
 and inside miracidium continuously
 strikes the operculum during movement
 This loosening and continuously
 striking leads to the finally
 removal of the operculum and the
 miracidium comes out.

STRUCTURE OF MIRACIDIUM —

- (i) The body is conical in shape.
- (ii) Anterior end broader than the posterior end.
- (iii) Anterior end projected into a conical lobe called apical papilla.
- (iv) The whole body is covered with the ciliated epithelium.
- (v) An apical gland opens in the apical papilla besides it are present of a pair of cephalic glands and penetration glands.
- (vi) The brain and the eye spot are present.
- (vii) A pair of flame cell is present.
- (viii) In the posterior side of the body is present a group of cells known as the gonon cells.



MIRACIDIUM LARVA



INTERNAL STRUCTURE OF MIRACIDIUM
ENTRANCE AND DEVELOPMENT INSIDE INTER-
MEDIATE HOST

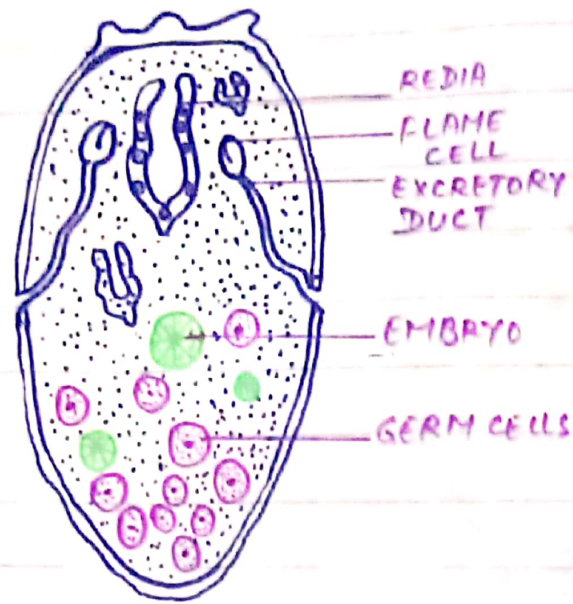
During the movement when the miracidium gets its intermediate host. It very quickly attaches with the skin with the help of apical gland and the penetration gland. The larva enters into the body of snail. Finally it reaches into the digestive glands where development starts. In about 2 weeks, the sporocyst larva is developed.

SPORO CYST

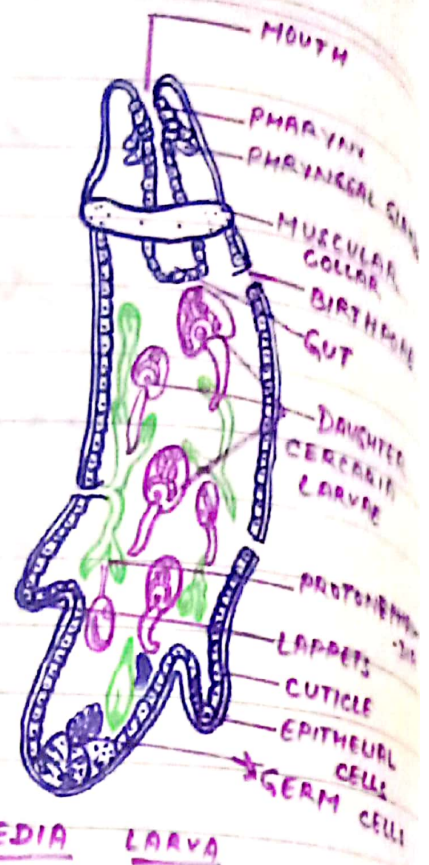
(i) It is an elongated sac like structure. The body is externally covered by cuticle. Beneath the cuticle is the external circular and external longitudinal muscle layer.

(ii) The flame cell increase in number.

(iii) The germinal cells give rise to aedia. Each sporocyst develops 3 to 8 aedia.



SPOROCYST LARVA



REDIA LARVA

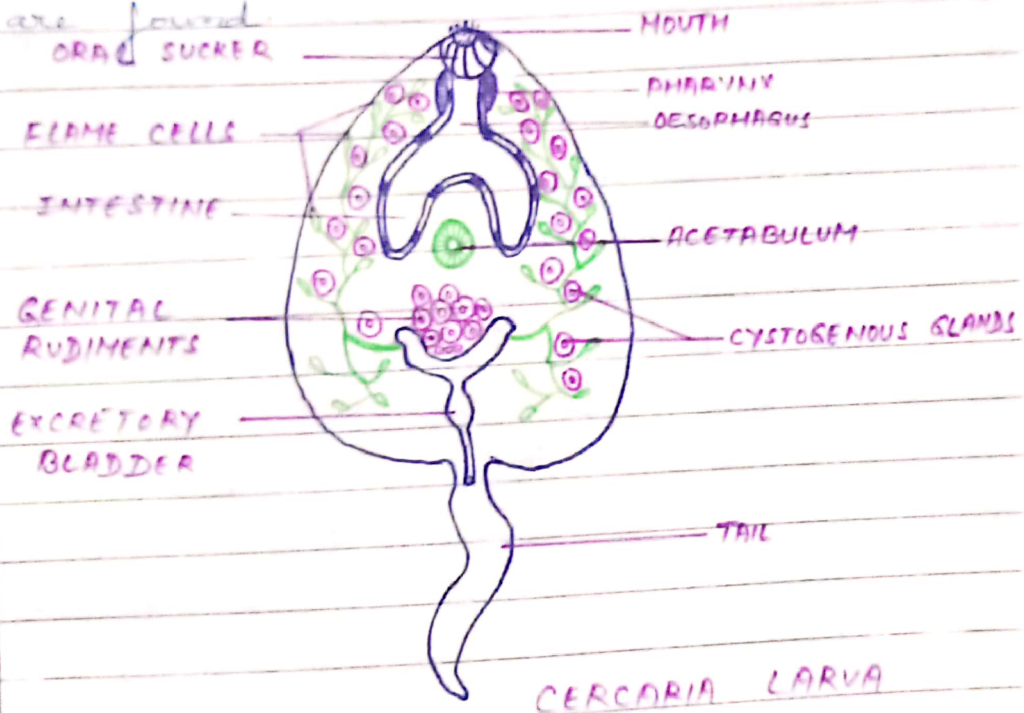
Redia -

- (i) A redia has an elongated cylindrical body, with an anterior mouth leading into muscular pharynx. Pharynx is provided with pharyngeal glands.
- (ii) Behind the pharynx is collar which is thick and muscular.
- (iii) In the form of excretory system two groups of flame cells on either side are present.
- (iv) In the posterior side there is an out growth in the outer covering called lappets. The first generation of redia gives birth to daughter redia which come out through the birth pore situated little behind the collar. The second generation of redia gives birth to cercaria.

CERCARIA -

- (i) It is flattened heart shaped structure provided with an elongated tail.

- (iii) In the anterior region the mouth is surrounded with the oral suckers. The mouth opens posteriorly into muscular pharynx which leads into oesophagus and finally bifurcates into intestinal limbs.
- (iv) At the bifurcation of the intestinal limb is acetabulum.
- (v) The excretory system is provided with collecting ducts and the flame cells.
- (vi) In the body wall cytogenous glands are found.



After attaining the maximum size the cercaria with the purpose to enter into the host breaks off its tail first and by the secretion of cytogenous glands. It forms a hard covering around the body. Now this stage is known as metacercaria.



METACERCARIA LARVA

ENTRANCES AND DEVELOPMENT INSIDE THE DEFINITIVE HOST

The metacercariae are found on the grass bladder, when the definite host - sheep starts grazing the grass bladder, the metacercariae are swallowed. After reaching in the duodenum, region by the action of digestive juices the metacercariae encyst i.e. cyst is with draw. Later on they migrate through the intestinal wall in the peristominal cavity and penetrate the liver capsule. Further they become sexually mature and start laying of eggs. In this way life cycle is completed.