

## Internal Organs : (Viscera)

- present inside the body
- enclosed within test / mantle

### ① Coelom to Atrium

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True coelom = reduced  
due to over development of atrium  
(called degeneration)

- The cavity lying b/w test to pharynx  
is increasing visceral organs called atrium

Hygon

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### ② locomotion to movement :

sessile

⇒

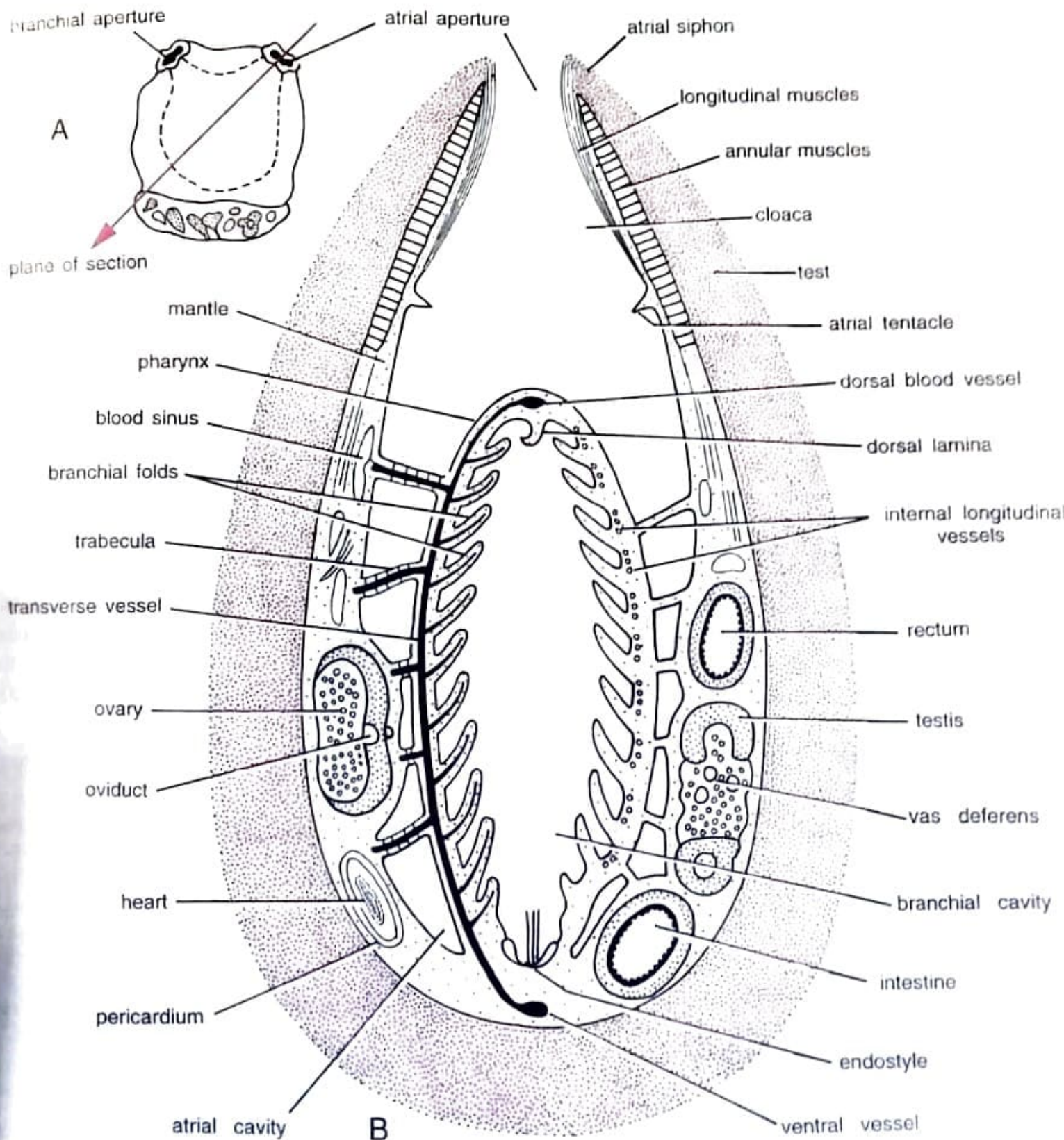


Fig. 7. *Herdmania*. A. Plane of section. B. Section of body showing relations of atrial cavity, pharynx, mantle and test.

## Digestive sys: →

- ① Alimentary Canal (A.C.)
- ② Digestive glands (D.G.)

① A.C. → Coiled, complete  
↓

② Mouth: → (B.A.) →

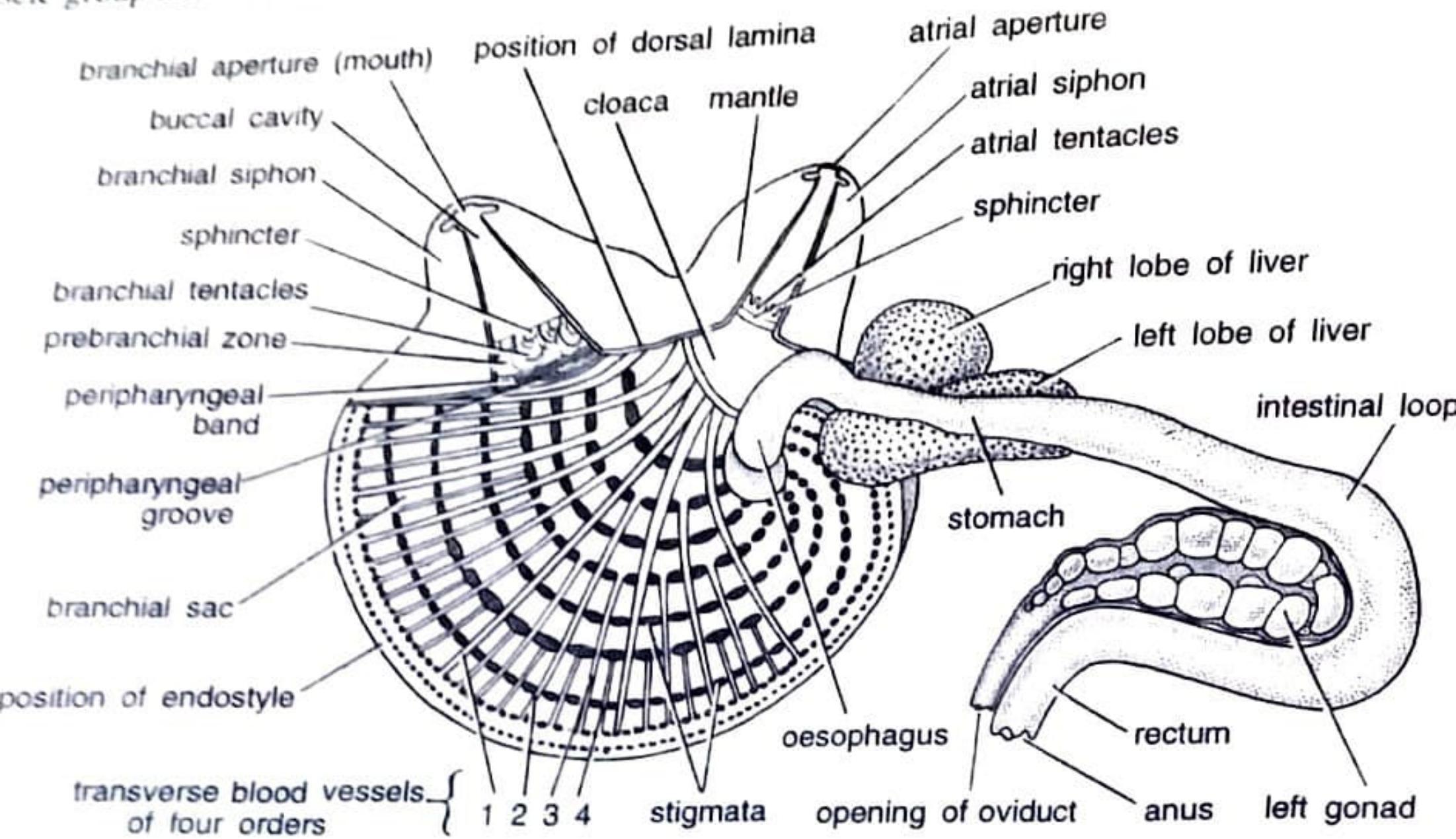
- B.A. opens on the B.S.
- Bordered by four lips & formed by test

③ Buccal Cavity: short, narrow, lined by mesoderm called stomodaeum or buccal cavity.

→ Branchial sphincter present near the base of siphon regulates its opening

specialized muscles-oral muscle group, atrial muscle group and atrio-oral muscle groups operate.

alimentary canal.



**Fig. 8.** *Herdmania*. Alimentary canal in left view after removal of test and mantle.

→ ~~Siphon~~ Siphon is provided with branchial tentacles



→ Their no. is about 64

→ sickle-shaped

→ Its upper border ~~is~~ called tentaculets

→ Free ends of tentacles meet the strainer which prevents entry of large food particles into pharynx

① Pharynx : Buccal cavity followed by pharynx



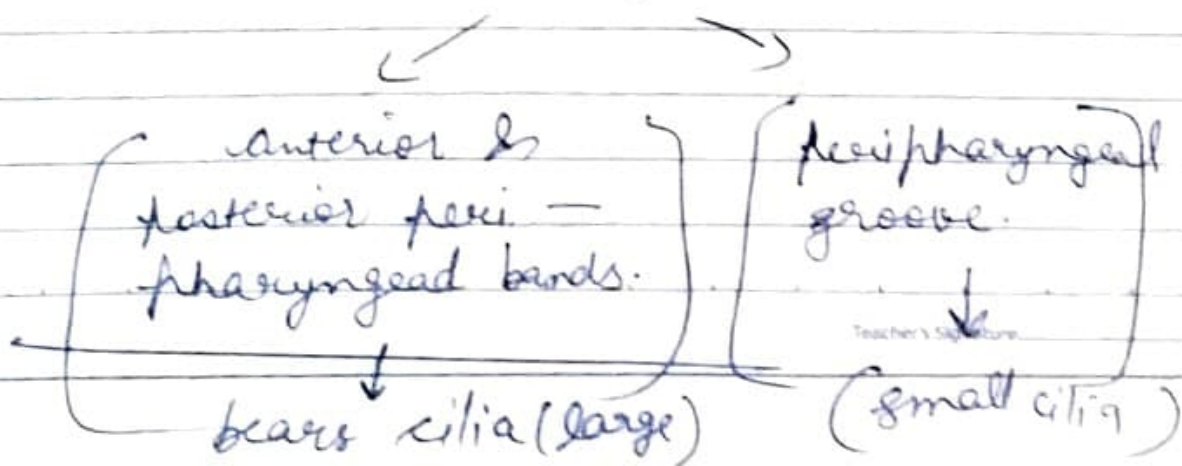
→ occupies major part of atrial cavity

→ 2 parts.

① Peribranchial zone (P.Z.)

② Branchial sac (B.S.)

① P.Z. ⇒ having cilia to stigmata  
⇒ 2 kinds of ~~bands~~ Branch



→ anterior peripharyngeal band made up of dorsal tubercle

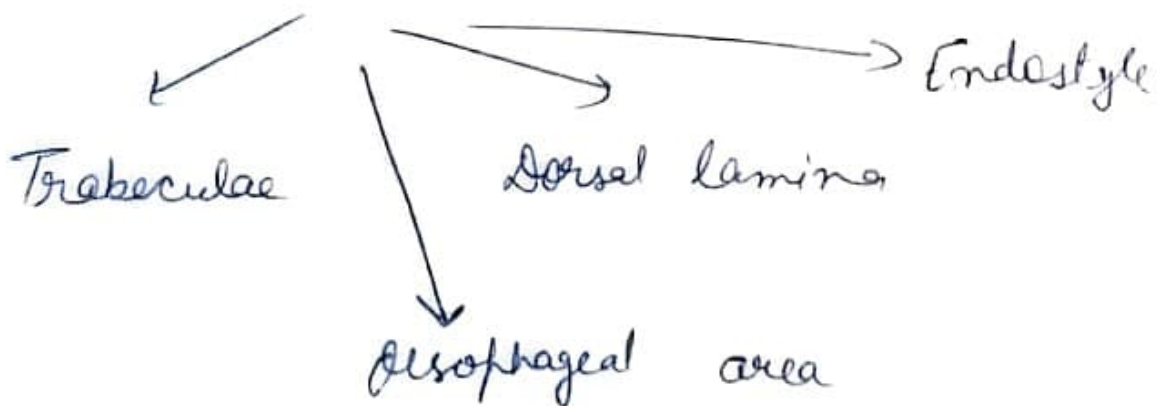
→ Posterior p. band made up of dorsal lamina & endostyle

② B.S → Posterior region of pharynx called Branchial Basket

→ each side of B.S bears 200,000 stigmata

→ arranged in transverse rows.

→ 3 parts -



(d)

oesophagus :-

Branchial sac leads into oesophagus

→ which is short, curved & open  
into stomach

### (E) Stomach

It is wider than oesophagus, thinwalled, sphinctered at both ends, has a smooth inner surface, and is surrounded on either side by the right and left lobes of liver.

### (F) Intestine

The stomach leads into the intestine which is a thin-walled, U-shaped tube formed by a proximal, ventral or **descending limb** and a distal, dorsal or **ascending limb**, both united anteriorly. The intestinal loop, thus formed, encloses the left gonad (Fig. 18).

### (G) Rectum

Posteriorly the terminal part of intestine leads into a short, narrow tube, the **rectum**, internally lined by cilia. It curves dorsally to open into the atrium or **cloaca** through the **anus** which is bounded by four lips.



## (H) Cloaca

The atrial cavity or cloaca leads dorsally into the atrial siphon which opens to the outside through the atrial aperture. The atrial siphon is lined internally by ectoderm and thus represents the proctodaeum.

## Digestive Glands

### (A) Liver

Liver of *Herdmania* is a large dark brown bilobed digestive gland made of a larger left lobe and a smaller right lobe attached on either side of the stomach. Liver is composed of a large number of tubules or caeca embedded in a connective tissue matrix containing blood sinuses. Tubules unite to form 11 or 12 hepatic ducts which open independently into the stomach. Liver secretion contains a strong amylase, a protease and a mild lipase.

### (B) Pyloric Gland

It consists of a large number of branching tubules in the walls of stomach and intestine. They open by a single duct into the middle of the proximal limb of intestine. The pyloric gland of *Herdmania* probably performs a dual function, that of a vertebrate pancreas and of an excretory organ.

## Food, Feeding and Digestion

### (A) Food

Due to sedentary habit, *Herdmania* is a ciliary or filter feeder. The food consists of microscopic planktonic organisms such as algae, diatoms, infusorians, etc.

### (B) Feeding or Food Collection

Outward beatings of lateral cilia lining, the stigmata set up a constant water current which enters through the mouth and buccal cavity into the pharynx, passes through stigmata into the atrial cavity and leaves the body through atrial siphon (cloaca) and atrial aperture. The branchial tentacles, forming a sort of sieve or strainer,

prevent larger particles from allowing minute food particles to enter the pharynx along with the water current. The tentacles probably also act as chemoreceptors and keep out the impurities present in sea water. The larger particles and impurities are thrown out of the mouth by producing a strong reverse current. The lateral cilia of stigmata retain the food particles inside the branchial sac, which settle on its wall. Enormous quantity of viscid mucus secreted by the gland cells of endostyle is whipped up along the inner lateral walls of branchial sac by the lashing movements of the endostylar cilia. The food particles entangled with this mucus are also shifted dorsally by the frontal cilia that beat upwards. The food-laden mucus finally reaches the dorsal lamina, rolled up into a cylindrical mass. Here, it is driven backwards by ciliary action in the form of a string or cord, in the groove formed by the curved languets of dorsal lamina and passes into the oesophagus aided by the oesophageal lips. From oesophagus the food passes into the stomach.

### (C) Digestion

In stomach, food is digested by the enzymes present in the liver secretion. Amylase hydrolyses starch into maltose, protease breaks down proteins, and lipase acts on fats. Secretion of pyloric gland probably has an accessory digestive function similar to that of pancreas. Digestion is completed and the digested food absorbed in the intestine. The undigested food material passes into rectum and driven out by rectal cilia into cloaca through anus as a much coiled faecal cord with mucus. It is expelled out forcefully up to a distance of 10-12 cm through atrial aperture by the sudden contractions of the body.

Reserve food in the form of concentrically striated starch-like granules is present in the liver and the walls of oesophagus, stomach and intestine.