DIGESTIVE SYSTEM OF BRANCHIOSTOMA

For- B.Sc. IIIrd Sem Paper I Unit-I

PART- II

By

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DIGESTIVE SYSTEM OF *Branchistoma*

Digestive system of *Branchistoma* is well developed and comprises alimentary canal and digestive glands.

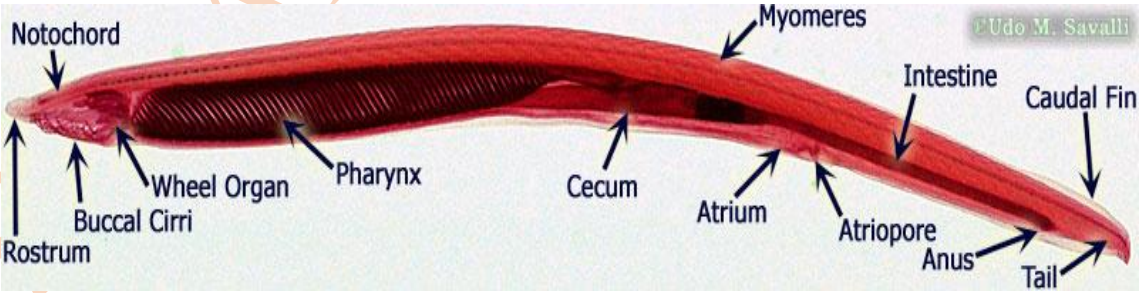
Alimentary canal

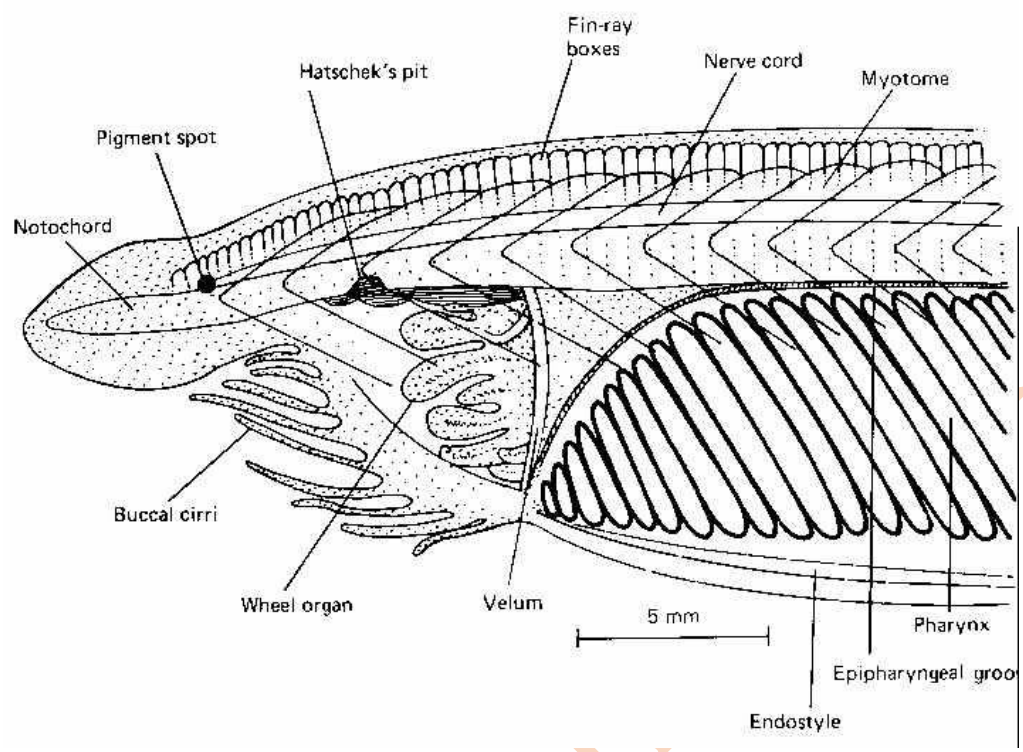
It is complete, straight tube lined throughoutthe ciliated epitheliumandhaving following parts-

Mouth-A large median aperture situated at the antero ventral below the rostrum called mouth. It bordered by a membrane called oral hood.

Oral hood and buccal cavity- It is formed by the dorsal and lateral projections of the anterior end of the trunk and comprises following parts-

1. Buccal cirri-There are 10-11 pairs finger like ciliary projections present in the buccal cavity called oral cirri. It prevents entry of larger particles in the mouth.
2. Vestibule- Oral hood enclosed a large funnel shaped cavity called vestibule or buccal cavity.
3. Wheel organ- Epithelial lining of oral hood forms 6-8 pairs of finger like folds. Each fold from by a ciliated groove which is bordered by ciliatedridge and collectively form the wheel organ or rotatory organ/ Muller's organ. It help transporting food particles into the mouth. The end of its largest mid dorsal groove form a small depression on the roof of buccal cavity named Hatscheks groove or Hatscheks pit.





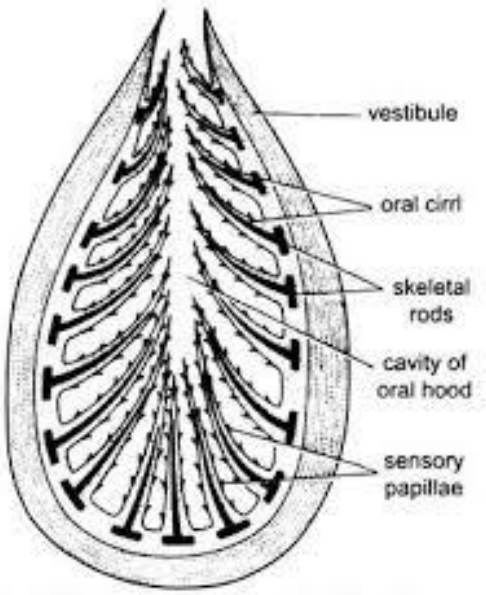


Fig. 6.10. *Branchiostoma.* Oral hood.

Velum and enterostome

Posteriorly vestibule is closed by a circular ring like membrane called called velum membrane. It have a central circular aperture calledenterostome which leads into pharynx. Velum helps in closing and opening of mouth.

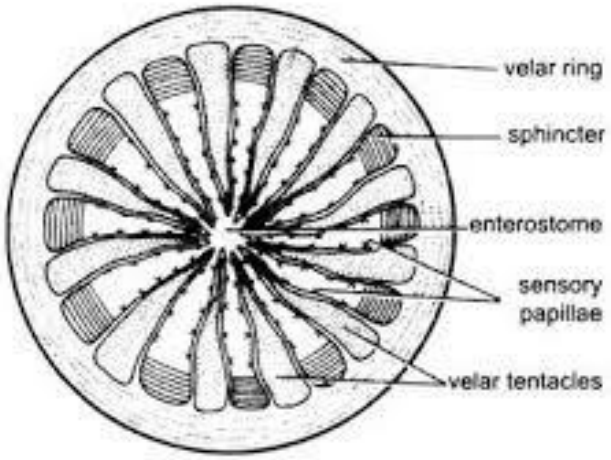


Fig. 6.11. *Branchiostoma*. Velum.

Pharynx

It is the largest part of alimentary canal and occupies nearly one half anterior part of the body. It remains suspended in the atrial cavity.

Pharynx comprises following parts-

1. Pharyngeal wall and gillslits

Pharynx perforated by 150-200 pairs of narrow vertical openings called gillslits through which Pharyngeal cavity communicates to atrial cavity. Each gillslits consists of a Ciliated epithelial coveringwhich enclosed fibres, connective tissue and blood vessels.. Gillslits internally supported by gelatinous rods.

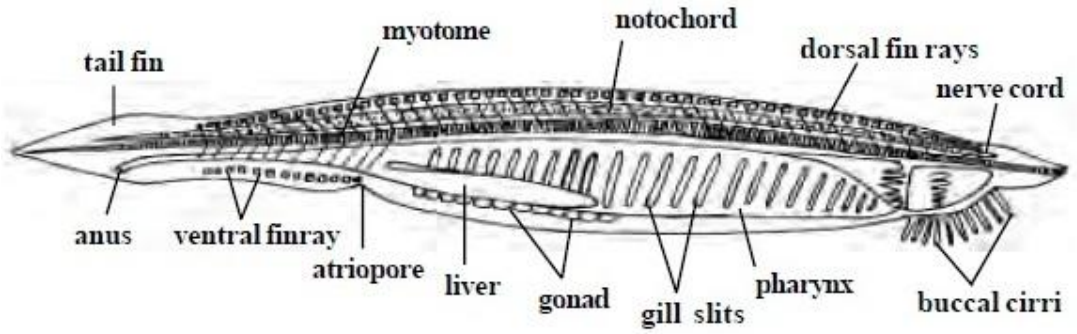
2. Endostyle

A hypobranchialtract extends midventrally along the entire floor of pharynx. It fromsa shallow groove with four longitudinal tracts of mucus secreting glands Endostyle is homologous to vertibrate thyroid gland.

3. Epiphyrageal groove

It is a Ciliated groove presentmiddorsally along the roof of pharynx and run upto the oesophageal opening.

4. **Peripharyngeal bands** A pair narrow CiliatedCiliated tracts arising from the anterior end of the Endostyle.



(a) Amphioxus - Entire

Oesophagus

A narrow tube communicate pharynx to gut.

Intestine

Intestine is a long tube like structure covered by thin layer of smooth muscles and differentiated into three parts It's anterior wide part called midgut, a large blind diverticulum and a terminal rectum. Rectum open outside through the anus. Most of the digestion and absorption takes place in intestine.

Anus

A circular aperture open at the base of caudal fin.

Digestive glands

The midgut diverticulum refferd as liver is the main digestive gland, situated at the junction of oesophagus and midgut. Its inner lining has a strong ciliated groove for movement of food It's zymogen cellssecretes a number of digestive enzymes. In state of these ciliated lining of intestine also have many gland cells which secrete digestive enzymes.

Physiology of feeding and digestion

It is a ciliary feeder feeds microscopic protozoans, diatoms and other pelagic organisms found in sea water.

Feeding mechanism

It filter the food particles from the water current. Filtration and selection of food particles carried out by the help oforal cirri, vestibular tentacles and finally by pharynx.Pharynx

transfer food particles into gut and waterinto atrial cavity via gillslits and finally out through atriopore. Thus pharynx play important role in food collection.

Digestion

In *Branchistoma* digestive enzymes are secreted from midgut diverticulum and midgut epithelium. Digestion starts frommidgut and continue in the remaining parts of the intestine. The digestion is extracellular. There are three digestive enzymes like amylase,lipase and protease found in*Branchistoma*

Absorption

Digested food is partly absorped in midgut and mostly in hindgut. The indigestion food materials are taken out through anus.