

Alimentary canal in annelids

B.Sc First year Zoology (Honours) Paper - 1

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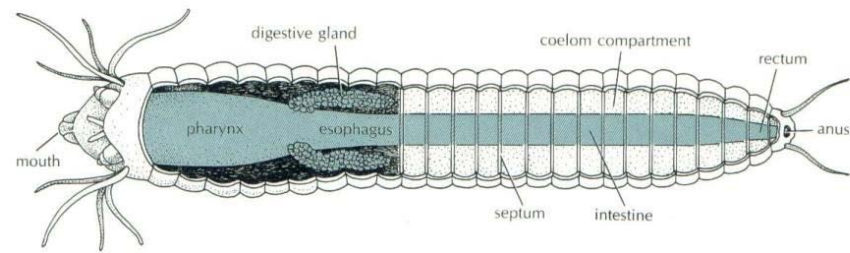
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Polychaeta - Nereis

Digestive System



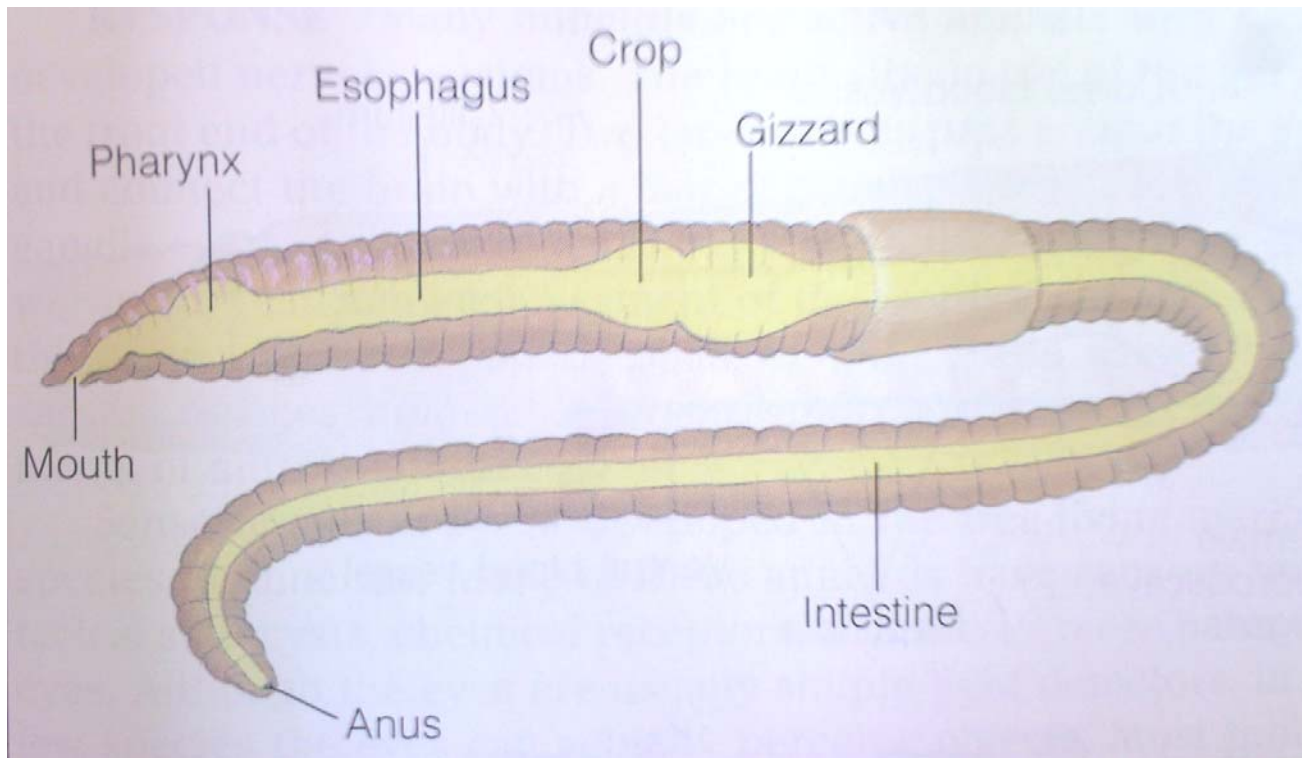
- Alimentary canal is a straight tube extending from anterior to posterior end of the body.
- The anterior opening is the mouth and posterior opening the anus.
- *Mouth* is located on ventral side of peristomium and opens into the buccal cavity, which carries teeth or *dentacles*.
- Pharynx is a large chamber and is lined internally by cuticle.

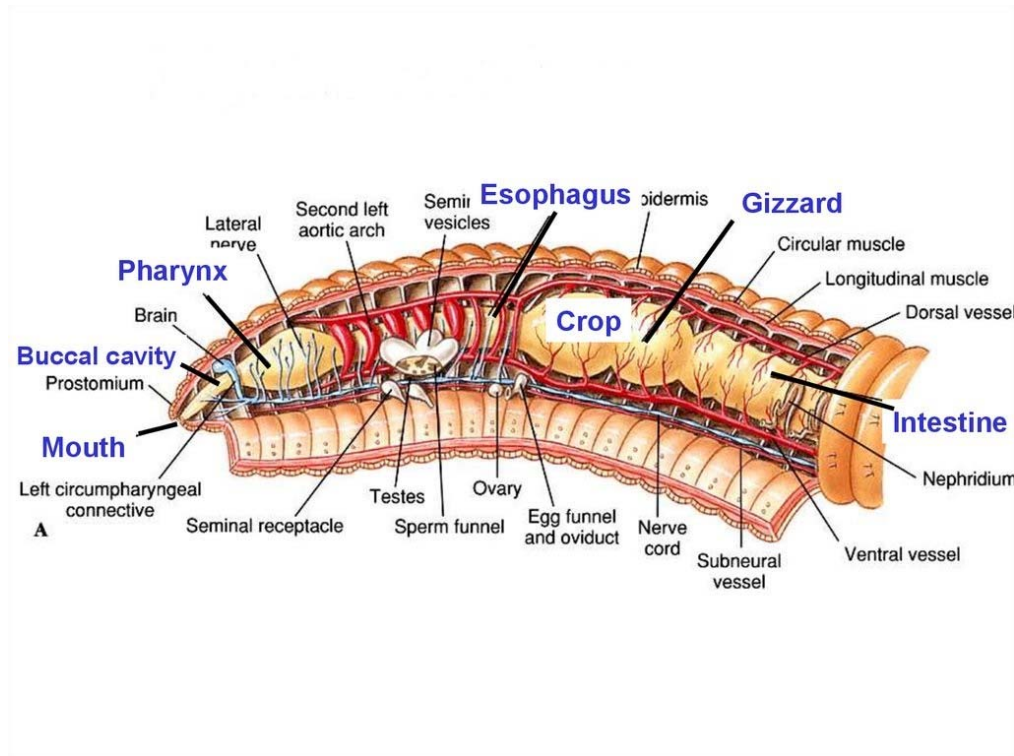
- One pair of jaws is present at the posterior end of pharynx.
- *Pharynx* can be protruded out of mouth by protractor muscles and can be withdrawn by retractor muscles.
- *Oesophagus* occupies five segments and receives a pair of glands.
- It communicates with stomach–intestine, which is a more or less straight tube that is constricted in each segment.
- A distinct stomach is absent in *Nereis*.

- Epithelial lining of mid-gut contains gland cells which secrete digestive enzymes.
- Rectum is the last part of intestine and opens to outside by anus.
- Nereis is a carnivore and feeds on small animals such as crustaceans, molluscs, sponges and other animals.
- Prey is captured by the eversion of pharynx, which brings the jaws in front to grasp the prey.
- Retraction is caused by contractions of retractor muscle which brings the prey deep into the pharynx.

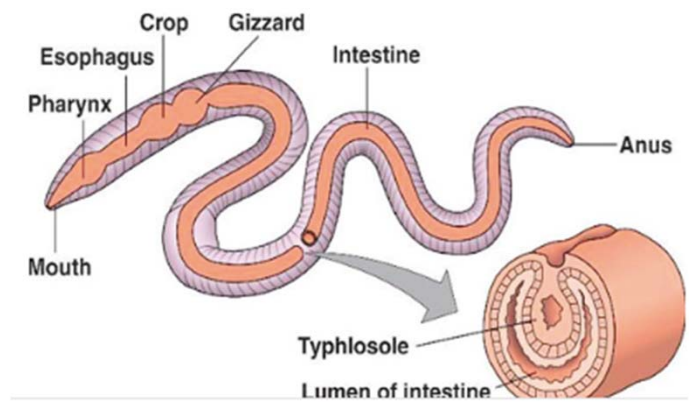
- The ingested food is masticated in the buccopharyngeal region by denticles.
- Food passes through the intestine by peristalsis and digestion is mainly extracellular and the food is digested by the digestive juices secreted by the oesophageal glands and the glands in the epithelial lining of stomach-intestine.
- Absorption of digested food also occurs in the stomach-intestine. The undigested food passes into rectum from where it is egested through anus.

Oligochaeta- Earthworm



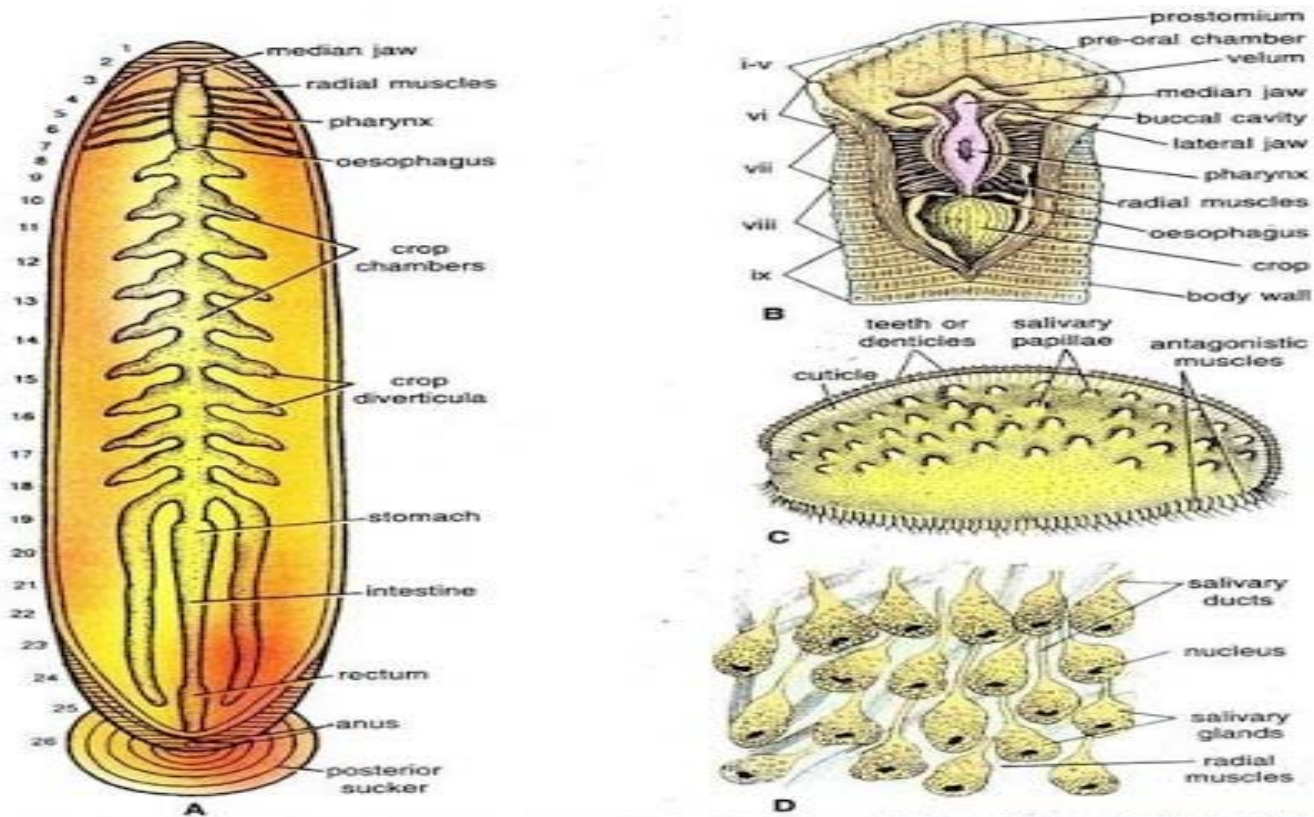


- Earthworm feeds upon organic matter found in soil by eversion of the buccal cavity that helps in ingesting the food along with soil through the mouth by sucking force of pharynx.
- The alimentary canal is a straight tube.
- Mouth opens into buccal cavity that leads into pharynx in segments 3 and 4, followed by oesophagus that leads to a thick-walled, muscular gizzard in which food is ground by muscular contractions.
- The salivary glands secrete mucin which lubricates food and protease which digests proteins.



- The stomach lies in segments 9-14. The wall of the stomach carries calciferous glands that neutralize humic acid.
- The intestine is wide tube and is divided into pretyphlosolar region in segments 15-26 and post-typhlosolar region after segment 26.
- The role of the typhlosole is to increase the surface of absorption. Intestinal caeca in segment 26 carry digestive glands which secrete digestive enzymes.
- The glandular cells of intestine secrete pepsin, trypsin, amylase, lipase and cellulase. Undigested food and soil are eliminated through anus to the outside in the form of castings.

Hirudinea - Leech



Hirudinaria. A—Alimentary canal; B—Anterior end dissected ventrally to show the buccal cavity and pharynx; C—A single jaw in lateral view; D—Salivary glands.

- Mouth is a tri-radiate aperture situated in the middle of the anterior sucker.
- There are three jaws, one is dorso-median and the other two are ventro-lateral.
- Jaws are provided with **papillae** which bear the openings of salivary glands.
- Pharynx extends from 5th to 8th segments, on the outer side of which are unicellular **salivary glands** that secrete *hirudin*, which prevents coagulation of host blood during feeding.
- Radial muscles dilate the pharynx and carry out suction of blood.
- The **crop** is the largest chamber of alimentary canal and extends from 9th to 18th segments, one chamber in each segment and a total of ten chambers.

- A pair of **caeca** project out laterally from each chamber, their length increases towards the posterior side and the last pair of caeca extends as far as 22nd segment.
- The crop leads to stomach whose walls are produced internally into transverse folds. The next chamber is **intestine** which is a small straight tube located in 20-22nd segments and narrows down at the posterior end into **rectum**, which opens on the dorsal side of 26th segment by anus.
- The sucked blood is stored in crop and enters for digestion in stomach and intestine drop by drop and takes lot of time for digestion.