

Alimentary canal Of Pheretima Posthuma

B.Sc (Hons.) Part -1 Paper – I (A) Non-Chordates

Dr. Poonam Kumari

INTRODUCTION

An earthworm is an invertebrate belonging to the phylum Annelida. They are found in the soil and make it fertile. They feed on dead organic matter. Pheretima and Lumbricus are the common earthworms found in India. The earthworms are burrowers. They are found in the soil rich in decaying organic matter. They are cold blooded poikilothermal animals. The earthworms are nocturnal in habit.

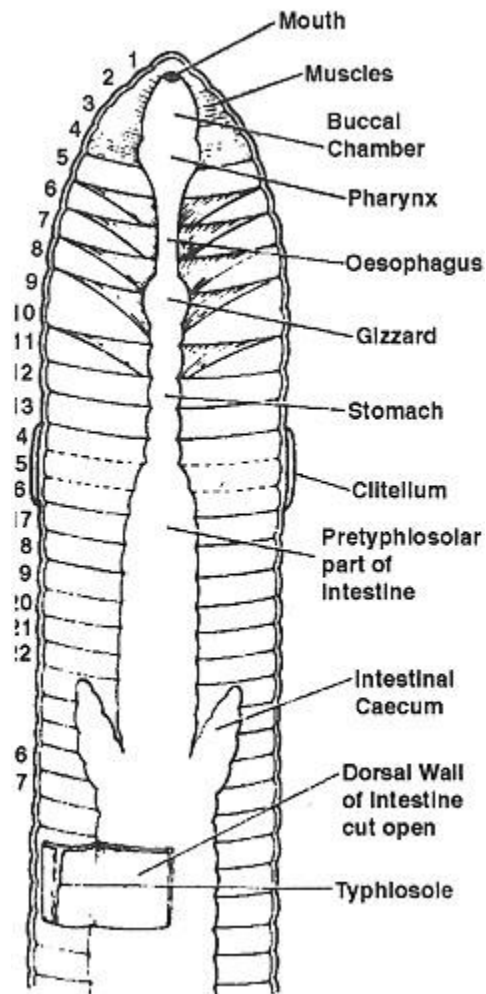
DIGESTIVE SYSTEM

The digestive system of earthworm consists of the alimentary canal and the digestive glands.

Alimentary canal is long and straight, extending from mouth to anus. It consists of following parts:

1. Mouth : 1st segment
2. Buccal Cavity : 2nd-3rd segment or middle of 3rd segment
3. Pharynx : 3rd-4th segment
4. Oesophagus : 5th -7th segment
5. Gizzard : 8th or 8th-9th segment
6. Stomach : 9th or 10th-14th segment
7. Intestine : 15th up to last segment except anus
8. Anus : last segment

PHERETIMA ALIMENTARY CANAL



1. Mouth and buccal chamber

- Crescentic aperture situated ventral to prostomium.
- The mouth leads into a short, narrow, thin-walled protrusible buccal chamber.
- Chamber extends up to the middle of 3 segments.
- Buccal cavity folded and surrounded by muscular strands.

2. Pharynx

- Followed by a buccal chamber.
- Extends up to the 4th segment.

- Pear-shaped broad and muscular separated from the buccal cavity by a groove.
- The pharynx roof is thick and projected into the pharyngeal bulb.
- Pharyngeal bulb lateral walls internally form narrow horizontal shelves.
- Two shelves meet anteriorly and posteriorly and divide the pharyngeal cavity into the dorsal salivary chamber and ventral conducting chamber.
- The roof of pharynx lined by ciliated epithelium.
- Many muscles with connective tissues and blood vessels present above epithelium.
- Outside these present salivary glands
- Glands secrete mucin for lubrication of food and
- Proteolytic enzymes for digestion of proteins.
- The ventral conducting system of pharynx serves as a passage for the ingested materials.
- Like the buccal chamber, the pharyngeal wall remains to connect with the body by a thick mass of muscular strands.
- Contraction and relaxation of muscular strands serve to compress or dilate the pharyngeal lumen.
- Acts as a pump during feeding.

3. Oesophagus

- Lined behind the pharynx.
- Short, narrow, thin-walled.
- Running up to 8th segments.

4. Gizzard

- Modification of the esophagus into the prominent, hard, and thick-walled muscular organ.
- Lying in 8th or 9th segments.
- The wall consists of circular muscles lined by the columnar cells.
- Columnar cells further lined by the tough cuticles.
- Grinds foods into fine particles.

5. Stomach

- The gizzard is followed by a short, narrow, and thin-walled tube.
- Extends up to 14th segments.
- Anterior and posterior opening sphincter.
- Walls highly vascular and glandular but less muscular.
- Internal wall folded transversely.
- The epithelial lining consists of glandular cells and some calciferous glands.
- Glandular Cells secrete a proteolytic enzyme.
- Calciferous glands secrete calcium and CO₂.
- Calcium neutralizes the contents of the alimentary canal.
- Calciferous glands are excretory removes ions of calcium and carbonates from the blood.

6. Intestine

- Stomach is followed by the intestine.
- Long, wide, and thin-walled tube.
- Extends from 15th segments to the anus.
- The internal lining has ciliated and glandular cells.
- Internal lining folded to form villi.
- One of those villi become larger and well developed to form typhlosole.
- Typhlosole runs mid-dorsally from 26th to last segments except 24, 25 segments.
- Divisible into 3 parts

1. Pre-typhlosolar region

- First part of intestine lying between 15th to 26th segments.
- Walls folded internally to forms minutes process, the villi.
- Villi are highly vascular.
- No typhlosole is found in this region.
- 26th segment gives out externally a pair of forwardly- directed conical outgrowth, intestinal caeca.
- Intestinal caeca extended up to 22nd or 23rd segment
- Internally have any folds to form a villi-like process.
- Highly vascular and filled with secretory cells.
- In this region active digestion occurs.

2. Typhlosolar region

- Second or middle part of the intestine.
- Lies between 26th to last segments except for 24, 25th segments.
- Characterized by the presence of highly glandular and vascular longitudinal ridge.
- Provided with internal median folds of the dorsal wall of intestine i.e. Typhlosole.
- It increases the absorptive surface of the intestine.
- Process of digestion complete in this region.

3. Post- typhlosolar region

- Third or last parts i.e. 24, 25 segments.
- Has no typhlosole.
- Called rectum.
- Thin-walled, vascularized without villi and glandular cells.
- Casting occurs here.

7. Anus

- The small circular opening at the terminal end.
- Last or anal segments of the body.