

Physiology of Digestion in Pheretima Posthuma

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

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Physiology of Digestion

- There are several enzymes found in Pheretima which are secreted by digestive glands for the digestion of food due to their omnivorous mode of feeding habit. The swallowed food passes through the buccal chamber into the pharynx where it receives the salivary secretions from the salivary gland cells.
- Ingested food is pressed to move posteriorly.
- No digestion occurs in the buccal chamber.
- In the ventral conducting chamber of the pharynx, it receives the salivary secretion from salivary gland cells.
- Salivary secretion contains mucin and proteolytic enzymes.
- Mucin lubricates food and food passages.
- Proteolytic enzymes hydrolyze proteins into peptones and proteases.
- Then, food comes into gizzard through the esophagus.
- Gizzard acts as a grinding machine that further grind food and soil.

- This is facilitated by contractile movements of its muscular wall which causes the food to roll about, internal cuticle lining, striking against food particles are ground up fully.
- Then, Food reaches in the stomach in fine states.
- Chalky secretion of calciferous glands located in the stomach wall neutralizes the humic acid present in the soil.
- Then food reaches the intestine.
- The intestine is the principal site of digestion.
- Enzymes are secreted by glandular cells of the intestine and intestinal caeca.
- Enzymes like pepsin, trypsin, amylase, lipase cellulase and chitinase are secreted.
- Pepsin hydrolyzes proteins into proteases and peptones
- Proteases hydrolyze peptones into amino acids.
- Trypsin hydrolyzes the product into amino acids.
- Amylases acting upon carbohydrates and converting them into monosaccharides.
- Lipase brings hydrolysis of fats into glycerol and fatty acids.
- Cellulase hydrolyses the cellulose into cellobiose.
- Chitinase hydrolyzes chitin present in food.
- Digestion is extracellular in the earthworm, as in higher animals such as frog and rabbits.
- Digestion occurs in the stomach and fully completed in the stomach.
- Intestine function for absorbing the digestive nutrients.

Absorption

- Digested food is absorbed by intestinal villi, more particularly by typhlosole.
- Absorbed food is passed to blood capillaries in the intestinal wall.
- Coelomic fluid also serves to transport digested food to tissues.

Egestion

- After digestion and absorption of food, undigested food and soils are passed out through anus as earthworm casting at the opening of burrows.
- The casting of earthworm consists of small and round pellets of balls.