

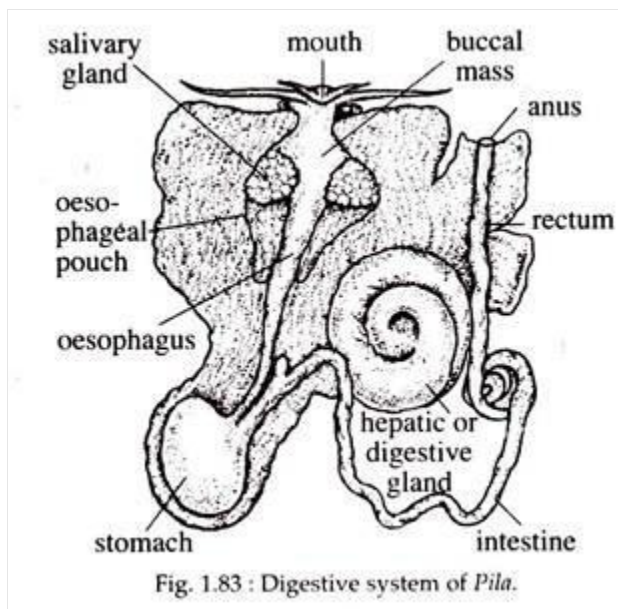
B. Sc (subsidiary) First year

Paper-1

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Pila: Digestive system

Pila is herbivorous and it lives primarily on aquatic vegetation. Its digestive system comprises of a tubular digestive canal and digestive glands (Fig. 1.83).



Digestive canal is made up of three distinct regions: (i) fore gut, (ii) mid gut and (iii) hind gut. The fore gut and hind gut develop from the embryonic ectodermal layer, while the mid gut is endodermal in origin.

(i) Fore Gut:

The fore gut includes the buccal mass and the esophagus. Mouth is a vertical slit which leads into the anterior end of the digestive tract which becomes greatly swelled to form an oval buccal cavity. The buccal cavity is enclosed by a strong thick-walled muscular structure called buccal mass. Many workers consider the buccal mass as the pharynx.

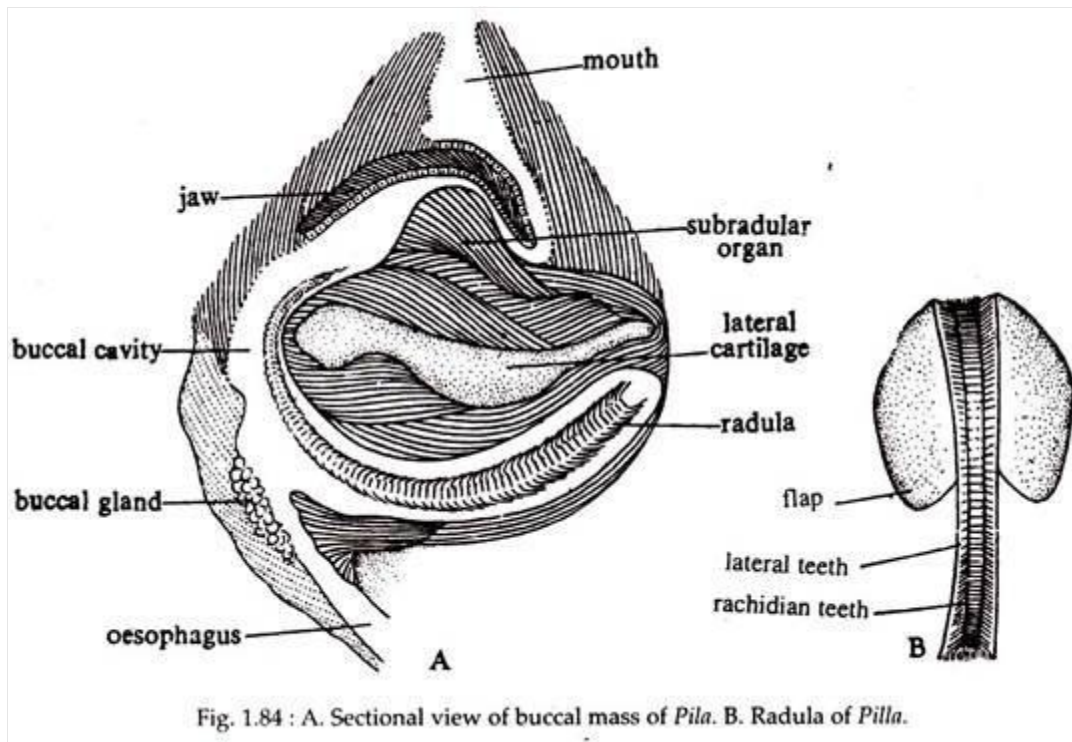


Fig. 1.84 : A. Sectional view of buccal mass of *Pila*. B. Radula of *Pilla*.

The entrance of the mouth is guarded by a pair of chitinous jaws projecting from the roof of the buccal cavity (Fig. 1.84A). At the floor of the buccal cavity, is present a chitinous ribbon-like structure called radula or lingual ribbon (Fig. 1.84B).

It is an elongated structure bearing transverse rows of serrations. Each transverse row contains about seven teeth — two marginals and a lateral on either sides of a median rachidian tooth, forming the formula 2, 1, 1, 1, 2 = 7. The radula is movably placed by muscles upon a large outgrowth of the floor of the buccal cavity called tongue mass or odontophore, which is made up of muscle with cartilaginous support.

The odontophore has an anteriorly placed subradular organ, which is more or less a rounded structure. It is divided into two by a median furrow. A small, pouch-like sublingual cavity is present beneath the subradular organ. The radula at the posterior end enters into a radular sac which supplies new teeth to the radula.

The radula is pushed forward by muscles from behind and it works as a file for rasping food materials. Dorso-laterally in the anterior region of the roof of the buccal mass lies a pair of jaws. The jaws are flexible.

Its anterior cutting edge is truncated and serrated, bearing numerous small and two or three large teeth-like processes. The jaws help to cut the aquatic vegetation upon which *Pila* feeds. The buccal cavity receives the secretion of two salivary glands, situated on its posterior side.

The buccal cavity leads into a long, narrow oesophagus. The oesophagus, just after its origin from the buccal mass, gives out on each side, small outpunchings called oesophageal pouch. The oesophagus leads into the stomach.

(ii) Mid Gut:

The mid gut consists of the stomach and the intestine. It is red in colour and is situated on the lower part of the visceral mass just below the pericardium. It is a large sac, bent on itself to form a 'U'-tube, one limb of which receives the oesophagus and the other leads into the intestine.

The portion at which the oesophagus ends is called the cardiac chamber, while the other end is called the pyloric chamber. The cardiac chamber constitutes the main part of the stomach. The wall of the cardiac chamber is corrugated while that in the pyloric part exhibits transverse folds.

The pyloric stomach is followed by a long narrow intestine that forms 2.5-3 coils. The posterior part of the intestine is nearly straight and turns to the anterior direction when it ends into the rectum.

(iii) Hind Gut:

It includes the rectum which is a thick-walled tube. It lies on the floor of the right side of the mantle cavity and finally opens to the exterior through a small anus. Anus is situated near the mouth within the right mantle opening.

Digestive glands include the salivary gland and the hepatic gland/digestive gland liver. There are two salivary glands situated on each side of the oesophagus. The two ducts of the salivary glands run anteriorly to open into the buccal cavity.

Their secretion consists of mucus and a starch digesting enzyme. The hepatic gland is black in colour and constitutes the main bulk of the visceral hump. It gives out two ducts which unite to form a common duct that opens into the stomach.

