

B.Sc. Part I Zoology Honors

Paper I 'A'

Phylum Mollusca. Type study - Pila

Pila Globosa

Pila globosa, commonly called Apple snail belongs to Phylum Mollusca. The genus Pila is usually found in oriental and Ethiopian regions. In the oriental region it is found in India (except Punjab and Sindh), Burma, Sri Lanka and other south east regions of Asiatic continent. But the common species found in India is Pila globosa. Its systematic position is

Phylum - Mollusca

Class - Cephalopoda Gastropoda

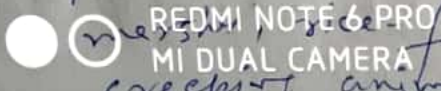
Subclass - Prosobranchia

Order - Megagastropoda

Genus - Pila

Species - globosa.

Habit & Habitat - Pila globosa is one of the largest freshwater molluscs. It is commonly found in freshwater ponds, pools, tanks, lakes, meadows, etc. They are creeping animals with amphibious mode

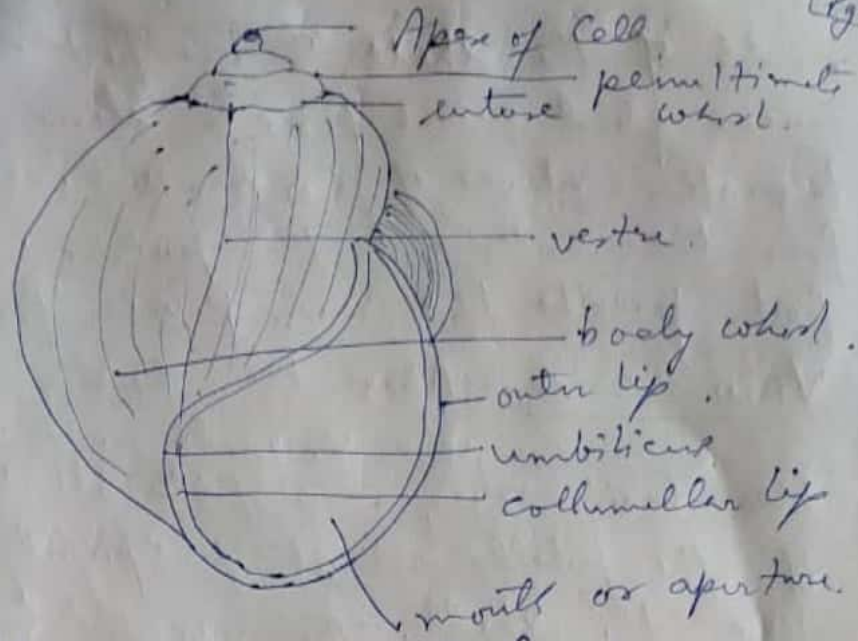


of life

External Features →

Shell → The shell of Pile, as is other coiled gastropode, is univalve but coiled around a central axis in a right-handed spiral. The top of the shell is the apex which is formed first and growth of shell takes place from it; the apex contains the smallest and the oldest whorl. Below apex is a spine consisting of several successively larger whorls or coils followed by penultimate whorl and the largest whorl or body whorl which encloses most of the body. The lines between the whorls are called sutures. Internally, all the whorls of the shell are freely communicate with one another; such a shell is called unilocular. The body whorl has a large mouth or opening, the margin of the mouth is called a peristome from which the head and the foot of the living animal can protrude.

Operculum - Fitting into the mouth of a shell is a calcareous operculum. its outer surface shows a number of rings of growth around a nucleus. the operculum is, secreted by the glandular cells of the foot.



Pila globosa : ventral view

Body : The body consists of a head, a foot and a visceral mass. In an expanded animal the head and foot come out of the shell-mouth but the visceral mass lies inside the shell-whorls. A columellar muscle arises from the foot and is inserted in the columella. It attaches the body to the shell and it withdraws the animal inside and closes the operculum.

(i) Head - The head bears two pairs of tentacles. The first pair of tentacles or labial palps are small and lie in front, the hind pair is larger. A pair of eyes borne on stalks are also present behind the tentacles and are called ommatophores.

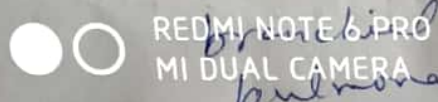
(ii) Foot - Below the head is a large muscular foot. It is triangular with the apex pointing backwards. When the foot is extended the operculum closes the

mouth of the shell. In the foot is a pedicel, mucous gland which forms a slime trail during locomotion. Waves of contraction which sweep from the anterior to the posterior end of the foot provide the main power for locomotion.

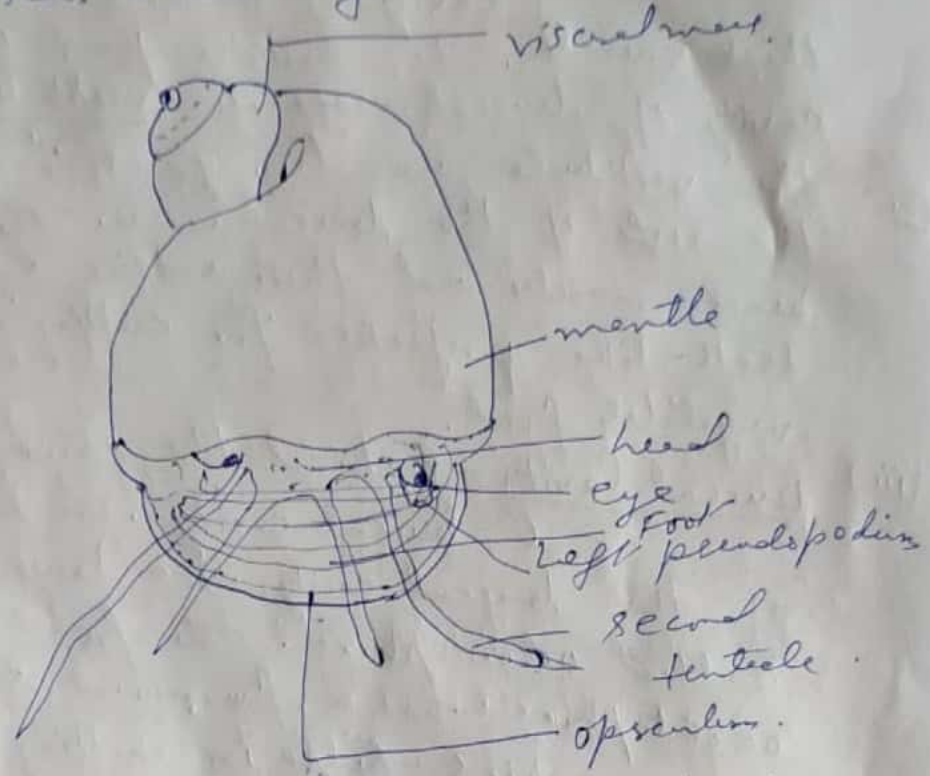
(iii) Visceral mass - Above the head foot complex is a visceral mass containing the main organs, it fills all the whorls of the shell and it is spirally coiled like the shell. The visceral mass exhibits the phenomenon of torsion which is distinct from coiling.

(iv) Mantle - The mantle, also called pallium, covers the visceral mass and forms a hood over the animal when it is withdrawn. The edge of the mantle is thick and contains shell glands which secrete shell. The mantle also has two fleshy lobes called nuchal lobes which are joined on either side of the head.

(v) Mantle Cavity & pallial Complex - In the anterior part, there is a large space between the mantle and the body, this is a mantle or pallial cavity, shifted to anterior due to torsion. It encloses a no. of organs and the head can be withdrawn into it. These together is called pallial Complex. Epitaxia, divides it into two chambers - right pallial cavity and left pallial cavity. A single gill, pallial sec. A single gill,



oo ctenidium, is present in the pulmonary chamber, along with anus and genital aperture. Near the left labial palp a fleshy osphradium, a typical molluscan sense organ is present.



Pile globose : front view showing different organs after removing shell.

Digestive System

The digestive system of Pile comprises -

1. a tubular alimentary canal
2. a pair of salivary glands and
3. a large digestive gland.

1. Alimentary Canal - The alimentary canal is distinguished into three regions - Foregut, midgut & hind-gut.

a) Foregut - The foregut includes, the mouth, buccal mass and oesophagus

(i) Mouth - The mouth is a narrow vertical slit situated at the end of snout. There are no true lips but the above edges above are as secondary lips.

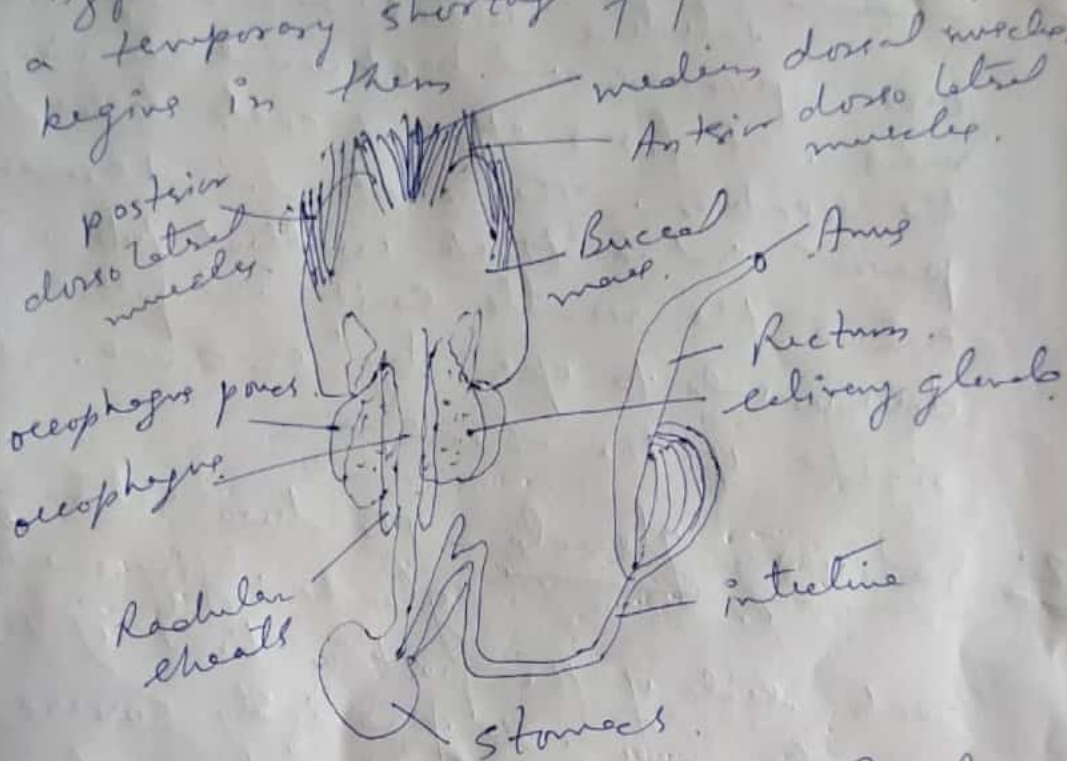
(ii) Buccal mass - The mouth leads into a large cavity of buccal mass having thick walls. The anterior part of the cavity of buccal mass is vestibule. Behind the vestibule are two jaws hanging from the roof of the buccal mass. The jaws bear muscles and their anterior edges have teeth-like projections for cutting up vegetable food.

(iii) Buccal Cavity - Behind the jaws is a large buccal cavity. On the floor of the buccal cavity is a large elevation called odontophore. The front part of odontophore has a furrowed subradular organ which helps in cutting food. The odontophore has protractor and retractor muscles and two pairs of cartilages, a pair of superior cartilages which project into the buccal cavity and a pair of large S-shaped lateral cartilages.

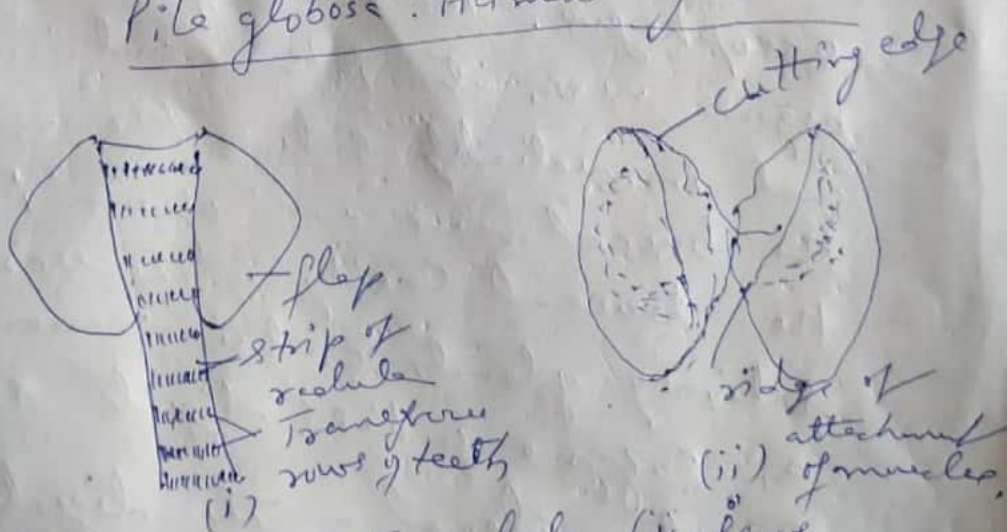
(iv) Radula - Above and behind the subradular organ is a leg-like radular sac which is a diverticulum of the buccal cavity. The radular sac has transverse rows of cells called odontoblasts. The radula moves forward and backward in the cavity for scraping food particles. The movements of radula are

called chain saw movements.

(1) Oceophagus - The buccal mass leads into a long narrow oceophagus. From the near the origin of the oceophagus arise a pair of round, whitish oceophageal pouches. They arise by short ducts and lie below the salivary glands. They are prolongations of the oceophagus, they probably secrete digestive enzymes. Oceophageal pouches serve for a temporary storage of food and dip begins in them.



Pila globosa: Alimentary Canal



Pila globosa: (i) The radula (ii) flap

b. Meggut - It includes stomach & intestine. Pg. 2
Stomach is divided into cardiac and pyloric chamber. The cardiac chamber is rounded and has folds in it. The pyloric portion has caecum.

From the pyloric chamber arise an intestine which runs along anterior edge. It then turns upward & backward.

c. Hingut - From the pyloric chamber arises an intestine which runs along and turns upward and backward in visceral mass. It forms 2½ or 3 coils before joining the rectum. The rectum is terminal part and is thick walled tube. It enters the mantle cavity and passes downwards to open by an anus on the right of the head.

2. Salivary glands - The two salivary glands lying one on each side of the buccal mass and oesophagus. The duct of each gland begins near its internal anterior corner and immediately enters the muscular of the buccal mass and opens into the buccal cavity. The secretion of salivary glands contains an enzyme which digests starch.

3. Digestive gland - The digestive gland, also called hepatopancreas, is somewhat

triangular plate or cone with a convex outer and more or less flattened inner surface.

The gland is brownish or dirty green colour, made up of a no. of fine tubules bound together by connective tissue. They produce a brown liquid containing an enzyme which dissolves cellulose of plants in the stomach.

