Unit Gen B

Phy. Cyclostomata

PETROMYZON (LAMPREY)

Before the advent of fishes the aquatic environment of the nature was covered by a group of unique animals which after the inexplainable work of zoological researchers was proved that these animals are the members of the Vertebrate and are known as Cyclostomes.

Habitat — The distribution regarding their natural habitat consists of the marine and fresh waters. petromyzon is found in the sea-coast of N. America, W. Africa, Europe and japan. Their presence was reported from temperate zones of both hemispheres (Hardisty and poller, 1971, 1972).

Size — P. marinus measures 1m long and fresh water form Lampetra fluviatiles measures 90 cm.

Shape — These are elongated, slimy eel like and posteriorly, Laterally Compressed.

External feature.

i) On the head and sides of the body are open apertures of lateral line system, though proper lateral line System absent.

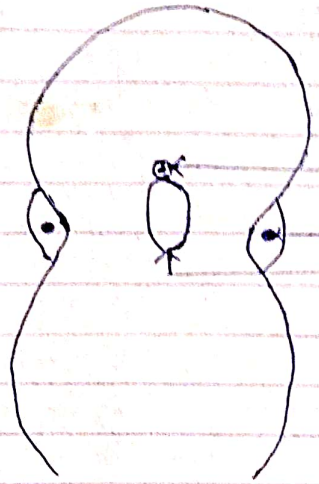
ii) It bears a laterally ~~Compressed~~ placed eye Covered by transperient skin.

iii) Eyelids are absent.

iv) On the dorsal side in the middle region is the single nasal aperture which leads into a nasal sac from which arises a long tube the naso-hypophysial sac which ends blindly.

v) Behind the nasal opening there is a gap in the pigment layer of skin through which pineal eye can be seen as a yellow spot.

vi) The pineal eye is sensative to light.



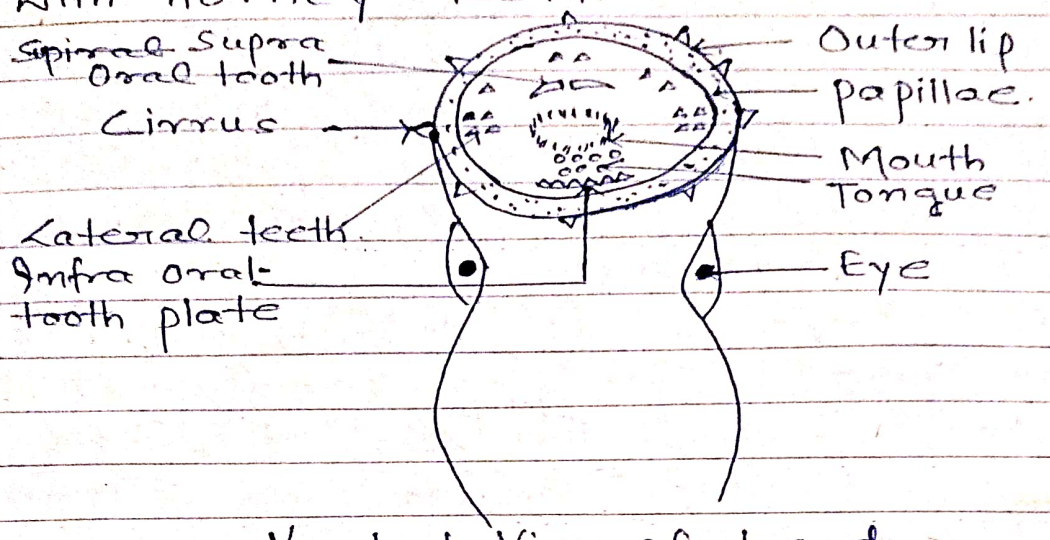
Dorsal View of head.

vii) Ventrally. On the head there is a round suctorial buccal funnel having a mouth at the bottom of the funnel.

viii) The margins of buccal funnel have a soft papillae, inside the funnel are horny epidermal teeth arranged in definite rows.

ix) protruding through the mouth into the

funnel is a powerful piston like tongue with horney teeth.



Ventral View of head.

x) All the teeth are Cone shaped and replaced Continuously when worn Out.
xi) The tongue is used for rasping flesh and funnel for sucking blood and mucous.
xii) A Salivary gland opens into the mouth Cavity below the tongue which secretes 'lamphedrin' which prevents the Coagulation of blood.
xiii) The whole body skin is devoid of scale and skin is many layered thick.
xiv) Two layered fin the second being Continuous with Caudal fin is present.
xv) The is laterally Compressed and proterocercal.
xvi) Numerous photorespective Cells are present on the tail.

Anatomical features

(a) Integument

ii) Below the layer Outermost epidermis are the layers of cutis, subcutis and finally the musculature.

iii) The inner layer of epidermis is protoplasmic and Outer is Cornified, Cornification is due to the production of keratin.

iii) Many gland cells occur in the epidermis which produce slime.

iv) The whole musculature is divided into myotomes which seen uniformly from head to tail.

v) The adjacent myotomes are separated by myocommatas. Each myotome has a ⋙ - shape, instead of the simple ≫ of amphioxus.

vi) Muscle fibres when seen longitudinaly are stripped, but of a some what peculiar fenestrated type.

i) The tubular notochord remain well developed through out life as a rod below the nerve cord. The rigidity of the whole rod depends on the turgour of the cells and it often collapses completely in fixed and dehydrated material.
ii) Complete skull.
iii) paired branchial basket Consists of a system of Ventrical rods between the gill slits joined by horizontal bars above and below them.
iv) stout lingual Cartilage and a ring of annular Cartilage.

(c) Digestive System.

i) Mouth is at the Central of the buccal funnel. The sucker is bounded at the edges by a series of lips which besides

being sensory serve also to make a light attachment when the lamprey rests.

ii) In the sucker are numerous teeth teeth whose arrangement varies in the different types of lamprey. These teeth are horney epidermal thickenings supported by cartilaginous pads, and therefore not comparable with the teeth of Vertebrates, which are derived mainly from mesodermal tissue.

The caps of keratin are replaced at frequent intervals keeping the teeth sharp during the parasitic phase. They become blunter before showing sharper and longer teeth are borne and a movable tongue which is used as a rasp. It leads into a large buccal cavity which posteriorly divides into dorsal Oesophagus and Ventral

respiratory tube.
iii) Oesophagus opens directly into a straight intestine.
iv) Surface of intestine is increased by typhlosole running in a spiral fashion.
v) True stomach is absent.
vi) The salivary glands are a pair of pigmented sacs, embedded in a hypobranchial muscles, each has a fold wall from which a duct proceeds forward to open below to tongue. The salivary glands produce a secretion that prevents coagulation of the blood of the fishes on which the lamprey feeds.
vii) Liver is without a bile duct and occurance of pancrease is uncertain.

(d) Circulatory System.

i) Heart is without Conus arteriosus and suspended in a special portion of the Coelom pericardium, whose walls are supported by Cartilage.
ii) The blood leaves the heart by Ventral aorta and is collected by a medium dorsal aorta.
iii) The heart is composed of thin walled auricle and thick walled Ventricle.
iv) The heart recieved nerve fibers from the Vagus nerves Contains nerve cells, which give a chromaffin reaction.

(e) Respiratory system.

i) There are seven pairs of gill pouches between the respiratory tube and the body wall.

ii) Each gill pouches Contains many gill filaments with fine capillaries in which aeration actually takes place.

(f) Nervous System.

i) The brain is poorly developed and is an purely Vertebrate plan spinal Cord is formed by of grey mater Only and is flattened dorsoventrally, apparently to allow the access of Oxygen.

ii) The fore brain is Smallest. (Ebbesson and Northcutl, 1976) The upper surface of the brain is Covered by an extensive Vascular pads, the Choroid plexus or telachoroided.

iii) The dorsal and Ventral spinal nerve are separated.

(g) Urinogenital System.

i) Urinary system includes Mesonephric kidney dorsally placed in the body.

ii) From each arises a tubular Ureter and runs to the Urinogenital sinus which open to the exterior as the Urinogenital papilla.

iii) primordial germ cells set a side very early in development migrate into unpaired ridges of gonads and develop into eggs Or sperms. The differentiation of gonads occurs relatively late in lampreys, so that in young ammocoetes the Organ is hermaphoralite, Containing developing Oocytes and spermatoCytes together.

iv) Sexes are separate in adult.

v) The aperture by which the gametes escapes are similar in two sexes and consists of short channels. One on each side, leading from the coelom to the lower end of the kidney duct.

vi) Fertilization is external.