

- (i) Nervous system is of usually vertebrate type but primitive. The cerebral hemispheres are small formed by small olfactory lobe and larger olfactory bulb.
- (ii) The diencephalon has a membranous roof.
- (iii) The hypothalamus is well developed. Pineal body and parietal organs are present.
- (iv) Mid brain has two optic lobes.
- (v) Cerebellum present in a small transverse band.
- (vi) Medulla oblongata is well developed.
- (vii) 10 pairs of cranial nerve present.

### Sense organ:

- (i) Eye ball is spherical with flat cornea. Eye muscles present.
- (ii) Single median naso-pharyngeal sac end blindly provided with olfactory receptors.
- (iii) The membranous labyrinth consists of utricle, a saccule and two semicircular canals.
- (iv) An ampulla containing cristae present at end of each canal. The saccule contain macula.
- (v) The lateral line sensory sense organs consists of small patches of sensory cells and sensory papillae.

### Excretory system:

- (i) The kidney is mesonephric type.
- (ii) The mesonephric tubule with Bowman's capsule with glomerulus but lacks nephrostomes.
- (iii) The two ureters runs to the urinogenital sinus which open to the exterior on the urinogenital papillae.

### Reproductive system:

- (i) The sexes are separate. The gonad is large unpaired median to mesonephrone. in life.
- (ii) Differentiation of gonads takes place quite late.
- (iii) P. marinus is anadromous. Fertilization is external. The development include a larva called ammocoet larva.

## AFFINITIES OF PETROMYZON (Cyclostomata)

The chordate characteristic of petromyzon (Cyclostomata) is clear cut. The similarity of several features of ammocoet larvae of lamprey with Cephalochordata indicate the primitive relationship. But adult cyclostomes has certain specialized as well as degenerate features as adaptation to particular habit. Thus the affinities of cyclostomata (Petromyzon) may be best described by discussing their (1) primitive (2) advanced (3) specialized and (4) degenerate character as they have certain ~~larva~~ ammocoet their larva has certain feature similar to Cephalochordate and certain specialized and degenerate characters.

### (1) Primitive characters of cyclostomes

1. True jaws are absent
2. Primitive appendages are absent
3. Cranium is incomplete
4. Absence of true teeth.
5. Only median fin present.
6. Diphycecal caudal fin.
7. Internal ear has one semicircular canal.
8. Medullated nerve absent.
9. Heart is simple and bent itself as 'S'
10. Nostril is single and median.

11. 15<sup>th</sup> & 16<sup>th</sup> cranial nerve not enclosed in cranium
12. Gonads without ducts
13. Endostyle in lamprey larva.
14. Ciliated alimentary canal.

## 2) Specialized characters:

### I) Characters showing advancement Amphioxus:

1. In cyclostomes there is a distinct head.
2. A feebly developed cranium present.
3. Brain is more advanced.
4. Ganglia are present.
5. Sympathetic nervous system present.
6. Primitive vertebrae present.
7. Pro and mesonephric kidney present.
8. Well developed external eyes & internal ears.

### II) Particular specialized characters:

- 1) Buccal funnel with horny teeth for attachment & rasping fleshy tongue bearing teeth.
- 2) Branchial basket present.
- 3) Dorsally located nostrils.
- 4) Large eggs, containing much yolk hence meroblastic incomplete cleavage.
- 5) Larval stage in Petromyzon.

### C) Degenerate characters:

- 1) Elongated and cylindrical body.
- 2) Rudimentary paired eyes in hagfish.
- 3) Liver reduced, lacks of bile duct and gall bladder in adult Petromyzon.