

METAMORPHOSIS:—

- (i) The endostyle is greatly changed and becomes coiled up and modified to form a thyroid gland which contains iodine.
- (ii) The buccal region becomes elongated, so that oral hood becomes the buccal funnel with horny teeth, tongue and complex musculature.
- (iii) Paired eyes appear, velum disappears and from the rudiment of the velum, skeletal rod develops.
- (iv) Gills develop in the gill slits and open into the pharynx.
- (v) The continuous dorsal fin is divided into the dorsal and a single caudal fin.
- (vi) The colour of the skin changes from light brown to greenish brown.
- (vii) Naso-hypopharyngeal sac is enlarged, ~~positive~~ posteriorly.
- (viii) The larval cranium which consists of parachordals, trabeculae, olfactory and otic capsules become filled up in the adult condition.

Metamorphosis is completed within a few weeks. The young lampreys then migrate down stream from the river to the sea where they change into the adult.

Significance of ammocoete larva:—

The study of ammocoete larva is of special interest because it shows striking similarities with Amphioxus.

The study reveals that the place of cyclostomes among Chordata as well as in Craniates is of considerable interest. It may be represented a stage in the evolution of Vertebrates in some respects. It may be regarded as a connecting link b/w Amphioxus and cyclostomes. This fact is supported by the presence of following primitive characters of larva.

- (i) Absence of buccal mouth and teeth. (9)
- (ii) Absence of endostyle groove in the floor of ~~pharynx~~ pharynx.
- (iii) Ciliary muscular type of feeding corresponding to the ciliary mode of feeding in Amphioxus.
- (iv) Absence of dorsal oesophagus.
- (v) Tube dwelling habit and continuity of the median fin.

All these characters are sufficient to support its phylogenetic position as a primitive Craniate b/w Amphioxus and Craniates.

### AFFINITIES:

Lampreys must be placed apart from the gnathostomes due to the presence of special characters such as (i) rapsmy tongue (ii) large sub-cerebral sac etc.

Some characters indicate that the cyclostomes branched from the common Craniate trunk at point far below that at which no class of gnathostomata branched.

- (i) Development of anterior myotomes.
- (ii) Absence of horizontal septum subdividing the myotomes.
- (iii) Some histological characters such as absence of medullary nerve fibres, the ciliated groove

The cyclostomes are divergent fish derived from the same member of the class fish. But a few characters like

- (i) presence of hypophysial sac.
- (ii) fully developed anterior myotomes.
- (iii) Larval thyroid gland.
- (iv) Rapsmy tongue etc. Cannot be due to degeneration.

However it cannot be denied that few lamprey and some ray fishes show some signs of degeneration. In myxinoidea

- (i) The vestigial eye. (ii) Absence of median fin muscle. (iii) many characters of skeleton may be attributed to degeneration. The total

(5)

The total absence of paired limbs and gills is of course, a very important feature. The cyclostomes show affinities with osteichthyes and true fishes.

### Resemblances with Fishes:

- (i) presence of gill slits to girdle arch.
- (ii) Chondro-cranium
- (iii) Generalized pattern of body.
- (iv) presence of median fin.

### Differences from Fishes:

- (i) Absence of jaws.
- (ii) mouth nearly terminal.
- (iii) Hypophysial sac present.
- (iv) presence of rasping appendages.
- (v) Absence of paired fins.

After viewing above facts it is concluded that cyclostomes are highly degenerated and specialized chordates originating as a highly specialized branch of agnatha in which the primitive bone was present and the individuals were jawless. After being separated from the main stock the cyclostomes lost some ~~characters~~ characters and became specialized in many respects. Now-a-days, they are present in the form of a specialized and degenerate descendent of vertebrate ancestry.

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