

## Echinodermata Larva - 2

### Echinopluteus Larva

Echinopluteus is microscopic, free swimming in water and it develops within 7 to 30 days. Metamorphosis is extremely rapid, taking place in about an hour. There is no attachment stage in echinoids.

This larva is formed after gastrulation. Gastrula becomes conical, one side of it flattens to form oral surface.

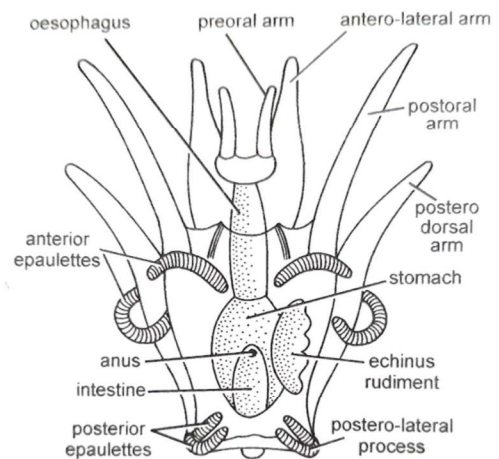
Stomodaeal invagination communicates with archenteron.

Gut is differentiated into mouth, oesophagus, stomach and intestine.

Blastopore remains as larval anus.

Larva starts to form projections which develop into arms. There are six arms namely, preoral, anterolateral, anterodorsal, postoral, postero-dorsal and posterolateral. Posterolateral arms are very short and directed outwards or backwards. In some cases, anterodorsal arms may also not develop. Thus a fully developed echinopluteus may have 5 or even 4 pairs of arms instead of usual six. Tips of the arms are pigmented and are supported by calcareous skeletal rods.

Locomotion is by ciliated bands, which in some case become thickened and known as epaulettes. In *Arbacia* and *Cidaris*, larva develops special ciliated lobes, between the arm bases known as vibratile lobes, auricular lobes or auricles.



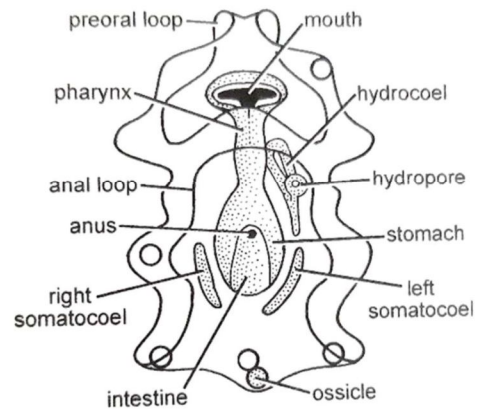
Archenteron gives off hydro-enterocoels which contribute to axocoels, hydrocoels and somatocoels.

A vestibule is formed by the enlargement of an ectodermal invagination on the left side. Hydrocoel and vestibule the oral side of the adult. Five radial arms, five primary podia are given off by the hydrocoel.

Lantern is formed from left stomocoel.

### Auricularia Larva

It is a larva of Holothuroidea. Following gastrulation and formation of coelomic sacs and gut, the embryo becomes a free-swimming larva called auricularia larva, within 3 days. It is transparent, pelagic about 0.5 to 1 mm in long. It swims about by a ciliated band which



form preoral loop and an anal loop. Internally, larva has a curved gut with sacciform stomach, hydrocoel and right and left somatocoels. Some giant auricularians of unknown adult reported from Bermuda, Japan and Canary island measure about 15 mm in length and possess frilly flagellated band.

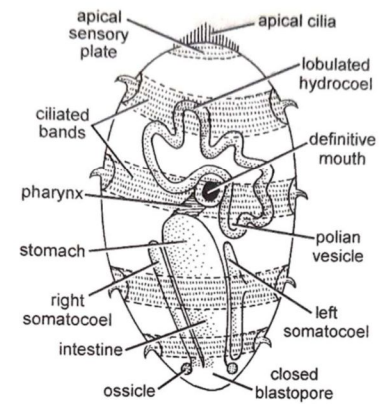
### Doliolaria Larva

It is a transitional stage from auricularia and barrel-shaped and alike doliolaria of crinoids. Continuous ciliated band breaks in 3 to 5 flagellated rings. Mouth is shifted to anterior and anus to posterior pole. Metamorphosis is gradual during which it acquires 5 tentacles and 1 to 2 functional podia. As such it is sometimes known as 'pentactula'. After appearance of more podia and tentacles, sea cucumber settles to the sea bottom and leads an adult mode

of life. Other forms of this class show marked peculiarities in larval development. In *Cucumaria planci* and *C. quinquesemita*, etc., there is no auricularia stage and embryo directly develops into doliolaria larva. In others like *C. saxiola*, *C. frondosa*, both of these, larval stages are omitted and the larva only swims about having an oval ciliated shape. In *Holothuria floridana*, embryo hatches directly into a young.

### Doliolaria Larva

It is a larva of crinoidea. It hatches as a free-swimming larva. Body has 4 to 5 ciliated bands with an apical sensory plate at the anterior end provided with a bunch of cilia. There is an adhesive pit over the first ciliated band, near the apical plate in the mid ventral line. Between second and third ciliated band lies the stomodaeum or vestibule. Skeleton also develops at this stage. After differentiation into prospective organs, larva attaches itself and internal organs rotate at an angle of 90 degrees from ventral to posterior position. Larva forms a stalk and is now referred as cystidean or pentacrinoid larva which after sometime metamorphose into adult.



*Doliolaria larva of Leptosynapta inhaerens*