

LARVAL FORMS IN ECHINODERMATA -1

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Echinodermata has most complicated metamorphosis in the course of development. Development may be direct or indirect. In direct development, there is no larval stage while in indirect development; various types of free-swimming larvae are formed. In each class, some members are viviparous, that is, they brood their young in a brood pouch on their body surface. The development of larva occurs in a typical deuterostomous fashion. In most cases the characteristic free swimming larvae develop externally which have great phylogenetic significance. Echinoderm larva is strikingly bilaterally symmetrical. It swims about by means of a ciliated band, which may be complicated by a number of short or long slender projection or arms from the body wall. Based upon the nature and position of the arms or their absence, larvae of different classes of Echinodermata may be distinguished. Following a free-swimming planktonic existence, the bilateral larva undergoes a metamorphosis, in which the adult becomes radial symmetrical.

Bipinnaria Larva

In indirect development, the eggs are homolecithal with little yolk and a free-swimming larval stage. After hatching, the larva develops cilia and begins a free-swimming life. It feeds on diatoms as an alimentary canal is formed. It has powerful ciliary band on stomodaeal walls that helps in feeding.

Two lateral longitudinal locomotory ciliated bands develop which connect in front of mouth, forming a preoral loop and in front of the anus, to form a preanal loop.

Preoral loop later, separates or in some cases and develops independently into an anterior ciliated ring around the body.

Three lateral lobes or projections also develop on each side of the body bordered by ciliary bands.

This larva is called bipinnaria and develops in 2 to 7 days.

Internal development of bipinnaria

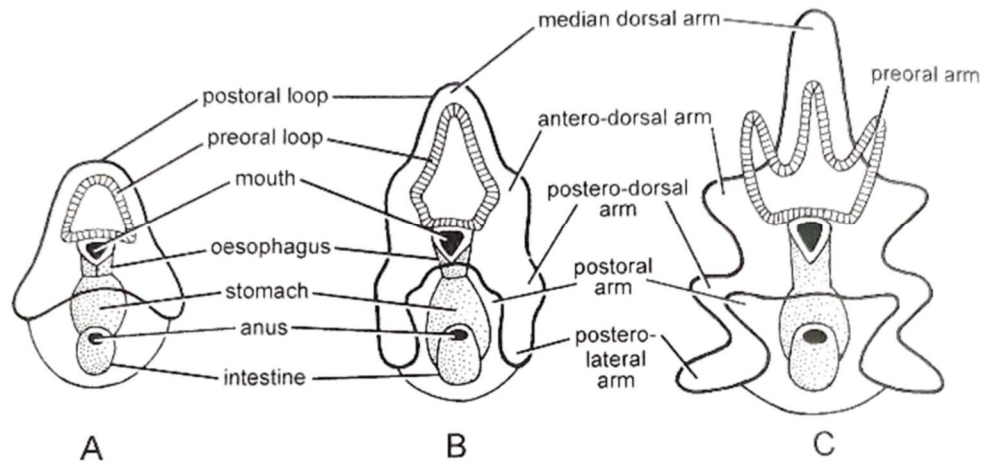


Figure. Stages in Bipinnaria larva development

Tip of larval archenteron forms the mesenchyme and later gives rise to two lateral pouches which connect anteriorly to form a U-shaped coelom. Posterior ends of the lateral pouches pinch off to form right and left somatocoels. Remaining anterior portion represents the **hydrocoel** and **axocoel**, but they never separate. Left hydrocoel connects with the dorsal surface to form the hydropore, without ectodermal invagination. Ventrally an ectodermal invagination meets the archenteron and the larval gut is differentiated into mouth, oesophagus, stomach and intestine. Blastopore remains as larval anus. Right somatocoel and axohydrocoel get reduced in metamorphosis, while left axohydrocoel gives rise to water ring and radial canals. Axocoel separates from hydrocoel and contributes to stone canal. Madreporite or dorsal sac originates either from rearrangement of mesenchyme cells or from ectodermal invagination or from right axohydrocoel. Bipinnaria larva, after free, swimming existence for a few weeks, changes into next larval stage, called brachiolaria larva.