

AFFINITY OF BALANOGLOSSUS

A. Affinity with Non –chordates

Balanoglossus possesses many structural similarities with invertebrates-

1. Affinity with Rhynchocephalia (Nemartines)

Similarities-

- i) Both the group exhibit similar burrowing habit.
- ii) Both the animals possess elongated vermiform body, without metamerism.
- iii) In both the group anus is terminal
- iv) Smooth skin provided with unicellular gland and nerve plexus
- v) Gonads are simple and metamerically arranged.

Dissimilarities-

Unlike Nemartines Balanoglossus possesses protrusible proboscis and dorsal nerve cord and do not possess lateral nerve cord.

2. Affinities with Phoronida-

Similarities-

- i) The oesophageal diverticulum of Balanoglossus is similar to the paired gastric diverticula of Phoronis.
- ii) The nature of epidermal nervous system is similar.
- iii) Both are tubicolous, Vermiform, and exhibit coelomate bilateral
- iv) Both the animals possess great power of regeneration.
- v) The Tornaria larva of Balanoglossus is similar in many characters with the Actinotroch larva of Phoronis. Both the larvae have similar disposition of coelom, ciliary ring in the anus and proboscis pore, sensory epical plate with cilia and eye spots.

Dissimilarities-

- i) Pharyngeal gill slits are absent in Phoronis, unlike Balanoglossus.
- ii) Many of the chordate characters found in Balanoglossus are absent in Phoronis.
- iii) The Actinotroch larva possesses larval tentacles unlike Tornaria.

3. Affinities with Progonophora-

Similarities-

- i) Both are enterocoelous with similar divisions.
- ii) Mesosome and metasome are separated by a septum.
- iii) The nervous system is intra epidermal.

- iv) Gonads are located in the trunk region.
- v) Definite peritoneum is absent.
- vi) Some degree of encroachment of muscle and connective tissue occur on the coelom.

Dissimilarities-

- i) Unlike Balanoglossus, the Progonophores possess protocoelic nephridal coelomduct.
- ii) Progonophores have no elementary canal.
- iii) The main nervous system located at the region of protosome, whereas in balanoglossus it is concentrated in mesosome.
- iv) Gill slits are absent in Progonophores.

4. Affinities with annelid-

Similarity-

- i) General vermiform body of both annelid and Balanoglossus is similar
- ii) Both are burrowing, ingesting mud and pass them out through anus as casting.
- iii) The proboscis of Balanoglossus and prostomium of annelid are comparable structure and both are pre oral.
- iv) Collar region of balanoglossus is similar to the clitellum of annelid.
- v) Heart is dorsal in position in both the animal.
- vi) Elementary canal is strait and tubular.
- vii) The **Tornaria** larva very much similar to the **Trochophore** larva of annelid. Both the larva are pelagic and bear similar constituent parts of the elementary canal.

Dissimilarities-

- i) Stomochord present in hemichordate is absent in annelid.
- ii) Pharyngeal gill slits are also absent in annelid.
- iii) Nerve cord is dorsal and hollow in Balanoglossus, but in annelid it is ventral, solid and double.
- iv) Nephridia of annelid are absent in Balanoglossus.
- v) Unlike balanoglossus the hepatic caeca are also absent in annelid.
- vi) Blastopore become the mouth in trochophore but it become the anus of adult form in tornaria.

5. Affinities with Echinodermata-

The adult hemichordates are quite different from the adult echinodermata but still workers like Metschnikoff find out some affinities, which are-

Similarity-

- i) The coelom is enterocoelic in origin and it is divided into three successive parts which are filled with sea water to serve as hydraulic mechanism.

- ii) The heart vesicle and glomerulus of enteropneusts are to the dorsal sac and axial gland of echinoderms. Both the structures are related to vascular and excretory function.
- iii) The poor nervous system develop into epidermal nerve plexus.
- iv) Both the group have same ecological niches and habits and provided with high degree of regeneration power.

Larval similarities -

- i) Both the tornaria of balanoglossus and bipennaria larva of echinodermata are pelagic and transparent.
- ii) The opening of proboscis cavity to outside in tornaria is comparable to hydrocoel of echinoderm bipolaria larva.
- iii) Early cleavage is similar in both the larvae.

Dissimilarities-

- i) Echinoderm larvae devoid of apical plate with sensory hair and eye spot and telotroch of tornaria.
- ii) Protocoel is single in tornaria but paired in echinoderm larvae.
- iii) Unlike balanoglossus echinoderms are generally radially symmetrical.

B. Affinities with Chordate-

Hemichordate exhibits some characters which make them primitive but in some other characters they possess similarity with chordate animal. So, its systematic position in the animal kingdom is always a debatable topic among the zoologist. These characters are -

Similarity-

- i) Hemichordate possesses ventral nerve cord extending throughout the body along with a dorsal nerve cord confined to the collar region of the body. This is surely a chordate character.
- ii) Hemichordate also posses gill slits in the pharyngeal region which is similar to the chordates.