

Phylum Platyhelminthes

General characters, Classification

Introduction

The phylum Platyhelminthes includes flatworms like Planarians, Flukes and Tapeworms. The animals of this phylum are triploblastic acoelomate bilaterians. The evolution of triploblastic condition and bilateral symmetry coincide with the evolution of organs and organ systems, cephalization and centralization of the nervous system. With these features and unidirectional movement, bilaterians have a more active life-style than radially symmetrical animals.

Platyhelminthes is a Greek term. (Gr. Platy=flat, helminth=worm). This term was coined by Gegenbaur. This name indicated the dorso ventrally flattened nature of the body. They have a solid body plan with parenchyma between the gut and the body wall. They also have a very well developed and a complex reproductive system.

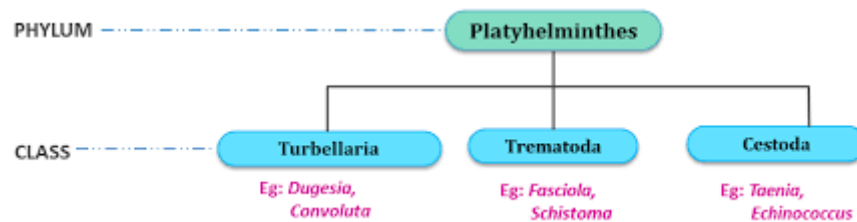
General Characters of Phylum Platyhelminthes

1. These are mostly parasitic. Some are free-living. The free living forms are chiefly aquatic and the majority are marine forms. A few are terrestrial, confined to humid areas.
2. They are triploblastic animals having three primary germ layers viz., ectoderm, endoderm and mesoderm. Mesoderm contributes to the development of true muscle tissue.
3. They show bilateral symmetry and cephalization.
4. They exhibit organ system of organisation.
5. They are acoelomates and lack large fluid filled body cavity. Connective tissue compartments between the gut and the body wall is called parenchyma.
6. Gut is a blind sac. Mouth is used for ingestion and egestion. Anus is absent except in some turbellarians. Digestion is both external and internal.
7. Respiratory and circulatory system are absent.
8. Protonephridia or flame cells are primarily osmoregulatory and secondarily excretory in function. Most of the excretory wastes diffuse out through the body surface.
9. Cerebral ganglia constitute the brain. Longitudinal nerve chords are joined by transverse commissures at regular intervals giving ladder like appearance.

10. Sense organs like ocelli and ciliary receptors occur in turbellarians.
11. Many turbellarians reproduce asexually by fission or budding.
12. They are mostly hermaphrodite. Some are unisexual (Eg: Schistosoma). Fertilization is internal.
13. Development is direct or indirect. Life history is simple in free living forms and is complex in parasitic forms. Polyembryony is common in trematodes

Classification of Phylum Platyhelminthes

The phylum Platyhelminthes includes about 20,000 species. This phylum is classified into three classes namely Turbellaria, Trematoda and Cestoda.



The following are the general characters of each of them,

Class I: Turbellaria (L. turbella=stirring)

- This class includes planarians, acoels etc.
- They are usually free living and some forms are also commensals or parasites
- The body of these animals is unsegmented and covered by ciliated epidermis.
- Epidermal glands cells secrete rod-shaped inclusions called rhabdoids. When these inclusions are released to the surface of epidermis they form mucus.
- Adhesive glands help in temporary adhesion to the substratum.
- Mouth is ventral and the pharynx is protrusible.
- The branched gut facilitates the transport of nutrients to all parts of the body. So gut performs the functions as a gastro vascular system
- Planarians have remarkable ability of regeneration. Totipotent cells called as neoblast cells are important in this phenomenon of regeneration.
- Development is direct but larvae like Muller's larva or Goette's larva are present in some forms.

Class II: Trematoda (Gr. Trema=hole, eidos=form)

- This class includes flukes
- Generally they live as ectoparasites or endoparasites.
- The body of these animals is segmented and covered by tegument called neodermis.
- Mouth is surrounded by oral sucker and sometimes a ventral sucker or acetabulum is also present.
- The intestine of these animals is bifid
- Life cycle includes miracidium larva, sporocyst, cercaria larva, metacercaria and adult.

Class III: Cestoda (Gr. Kestos=girdle, eidos=form)

- This class includes tapeworm.
- These are ectoparasitic in the gut of vertebrates.
- The body of these organisms is divided into scolex, neck and strobila. Body is covered by tegument. The strobila is in turn divided into proglottids.
- They exhibit pseudometamerism.
- Scolex has hooks and suckers for attachment to the gut wall of the host.
- Digestive tract is absent
- The life cycle includes zygote, oncosphere larva, extra intestinal juvenile and intestinal adult.
- Currently the two classes Cestoda and Trematoda are included under the taxon Neodermata. In these flatworms, the body is covered by a non-ciliated syncytial neodermis.