Bionomics and General Characteristics of Platyhelminthes

BSc. Part I Zoology (Hons) Paper I

Introduction

Phylum Platyhelminthes belongs to kingdom Animalia. This phylum includes 13,000 species. The organisms are also known as flatworms. These are accelomates and they include many free-living and parasitic life forms.

Members of this phylum range in size from a single-celled organism to around 2-3 feet long.

Characteristics of Platyhelminthes

Platyhelminthes have the following important characteristics:

- 1. They are triploblastic, acoelomate, and bilaterally symmetrical.
- 2. They may be free-living or parasites.
- 3. The body has a soft covering with or without cilia.
- 4. Their body is dorsoventrally flattened without any segments and appears like a leaf.
- 5. They are devoid of the anus and circulatory system but has a mouth.
- 6. They respire by simple diffusion through the body surface.
- 7. They have an organ system level of organization.
- 8. They do not have a digestive tract.
- 9. The space between the body wall and organs is filled with connective tissue parenchyma that helps in transporting the food material.
- 10. They are hermaphrodites, i.e., both male and female organs are present in the same body.
- 11. They reproduce sexually by fusion of gametes and asexually by regeneration by fission and regeneration. Fertilization is internal.
- 12. The life cycle is complicated with one or more larval stages.
- 13. They possess the quality of regeneration.
- 14. The flame cells help in excretion and osmoregulation.
- 15. The nervous system comprises the brain and two longitudinal nerve cords arranged in a ladder-like fashion.

Unique Characteristics of Platyhelminthes

Some of the characteristics that distinguish the organisms belonging to phylum Platyhelminthes from others are:

- Presence of flame cells.
- Ladder-like nervous system.
- Presence of parenchyma in the body cavity.
- Self-fertilization

Classification of Platyhelminthes

The classification of Platyhelminthes are given below:

- Turbellaria
- Trematoda
- Cestoda

Turbellaria

- These are free-living organisms found mostly in fresh water.
- The body is dorsoventrally flattened.
- Hooks and suckers are not present.
- For eg., Planaria, Otoplana

Trematoda

- These are mostly parasitic.
- Hooks and suckers are usually present.
- Eg., Fasciola hepatica, Diplozoon

Cestoda

- These are exclusively parasitic.
- They have hooks and suckers.
- Eg., Taenia spp., Convoluta

A few organisms belonging to these species cause severe diseases such as Schistosomiasis, or snail fever. It is one of the most dangerous diseases in tropical countries. Taeniasis is another disease caused by Tapeworms.

Examples of Platyhelminthes

The examples of organisms belonging to phylum Platyhelminthes are:

Dugesia (Planaria)

These are found in freshwater ponds or slow streams. Their body possesses cilia and has the power of regenerating the lost part. The head bears a pair of eyes and two lateral lobes.

Schistosoma

It is found in the mesenteric blood vessels and hepatic portal system of humans and is therefore known as blood fluke. It shows well-marked sexual dimorphism.

Schistosoma causes Schistosomiasis which spreads through contaminated water. The patient suffers from anaemia, pain, fever, liver and spleen enlargement, and diarrhoea.

Fasciola

It is also known as liver fluke since it resides in the liver and bile duct of sheep and goat. It is a hermaphrodite but cross-fertilization takes place.

It causes fascioliasis in animals. In this, the liver of the animal enlarges and the bile ducts are blocked. The infection weakens the muscles of the animals resulting in muscular pain. It might also prove fatal for the animals.

Taenia solium

It is also known as the pork tapeworm and is found in all the countries where pork is consumed. They live as parasites in the small intestine of human beings and their larva are found in the muscles of the pigs. It is a hermaphrodite and undergoes self-fertilization.

Taenia solium causes taeniasis where the patient experiences abdominal pain, anaemia, indigestion, restlessness and false appetite.

There are other organisms such as *Taenia saginata* that is transferred through beef in the human intestines, and *Echinococcus granulosus* that lives in the intestine of cats and dogs