Platyhelminthes = Flatworms

General attributes:

1. Bilaterally symmetrical.
2. Body having 3 layers of tissues with organs and organelles.
3. Body contains no internal cavity.
4. Has closed digestive system.
5. Has protonephridial excretory organs instead of an anus.
6. Has normally nervous system of longitudinal fibers rather than net.
7. Generally, dorsoventrally flattened (like ribbon).
8. Reproduction mostly sexual as hermaphrodites, sperm has two flagella.
9. Mostly they feed on animals and other smaller life forms.
10. Some species occur in all major habitats, including many as parasites of other animals.

Classification

Phylum: Platyhelminthes

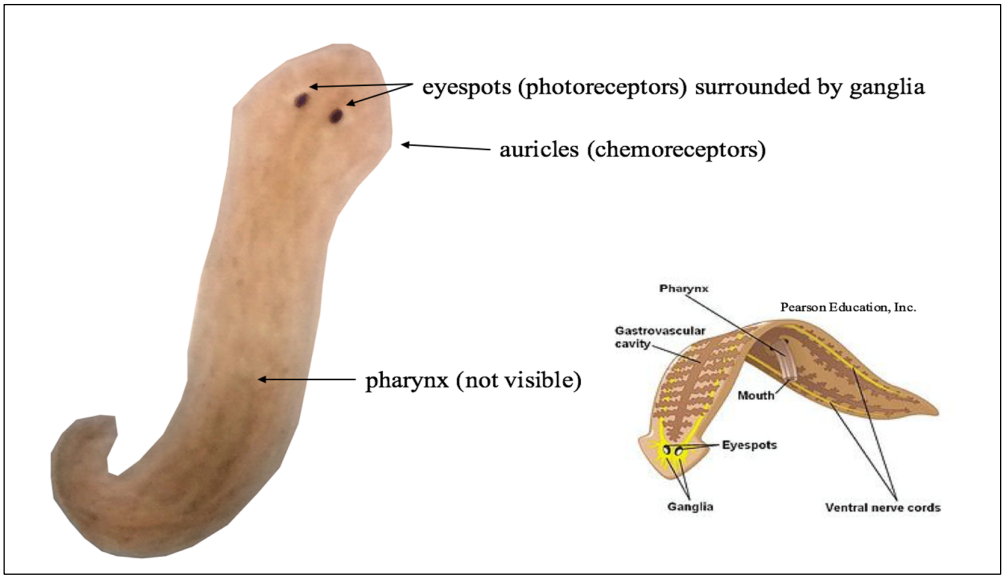
Divided into the following classes

1. Class: Turbellaria ……. Order: Tricladida ……. *Planaria*
2. Class: Monogenea …….. *Polystomum* (life cycle happen in one host, have posterior sucker).
3. Class: Trematoda: …… *Echinostoma* (Sucker around the mouth and an additional ventral sucker that is used for locomotion and attachment to the host).
4. Class: Cestoda
5. Order: Cestodaria …….. *Amphilina* (the body not segmented).
6. Order: Eucestoda …… *Taenia* (have segmented body).

Planaria

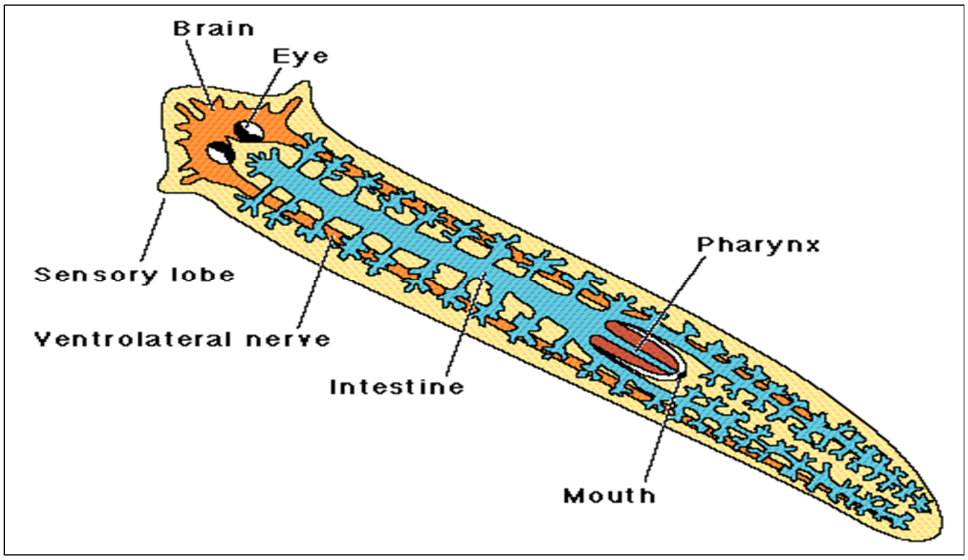
The Planarian has a soft, flat, wedge- shaped body that may be black, brown, blue, gray or white. The blunt, triangular head has two Ocelli (eyespots) pigmented areas that are sensitive to light. There are two auricles (earlike

projections) at the base of the head, which are sensitive to touch and the presence of certain chemicals. The mouth is located in the middle of the underside of the body, which is covered with cilia (hair like projections). *Planaria* are common to many parts of the words living in both saltwater and freshwater ponds and rivers. Some species are terrestrial and are found under logs, in or on the soil, and on plants in humid areas, it has no skeleton and it has tiny bristles called cilia that help it to move and there are two layers of layers of muscles under its skin. They receive and release carbon dioxide by diffusion.



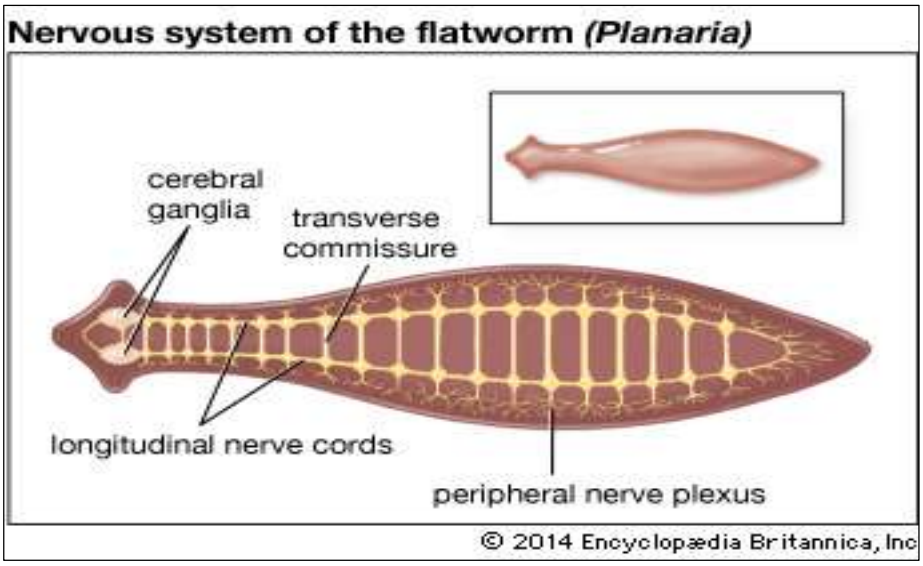
Digestivesystem

That system consists of a mouth, pharynx and gastro vascular cavity. The mouth is located in the center of the underside of the body. Digestive enzymes are secreted from the mouth to begin external digestion. The pharynx connects the mouth to the gastro vascular cavity. This structure branches throughout the body allowing nutrients from food to reach all extremities. *Planaria* eat living or dead small animals that they suck up with their muscular mouths. Food passes from the mouth through the pharynx into the intestines where it is digested by the cells lining the intestines, then its nutrients diffuse to the rest of the body.



Nervous system

At the head of *Planaria* there is ganglion under the eyespots. The cerebral ganglia a bi- lobed mass of nerve tissue is sometimes referred to as the *Planaria* brain and has been show to exhibit spontaneous electrophysiological oscillations, similar to the electroencephalographic (EEG) activity of other animals. From the ganglion, there are two nerve cords which extend the length of the tail. There are many transverse nerves connected to the nerve cords extending from the brain, which makes the nerve system look like a ladder with a ladder – like nerve system it is able to respond in a coordinated manner.

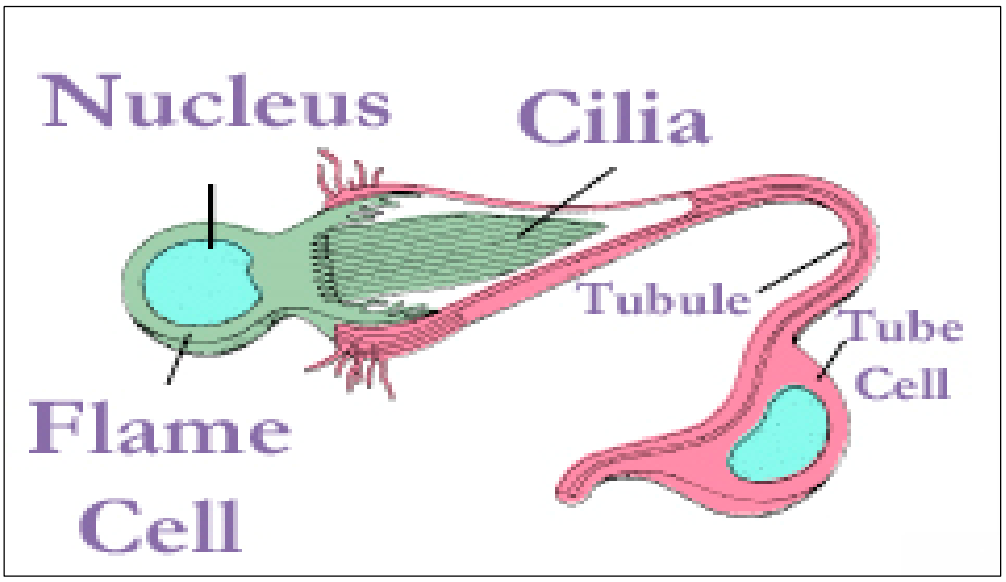


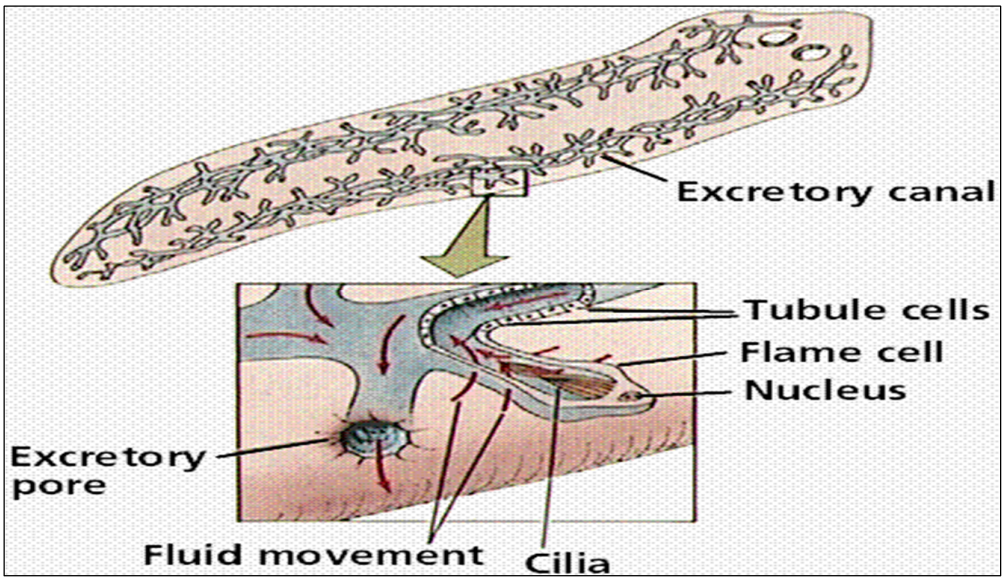
Excretory system

The excretory system is made of many tubes with many flame cells and excretory pores on them. Also, flame cells remove unwanted liquids from the body by passing them through ducts which lead to excretory pores where waste is released on the dorsal surface of the *Planaria.*

Flame cell

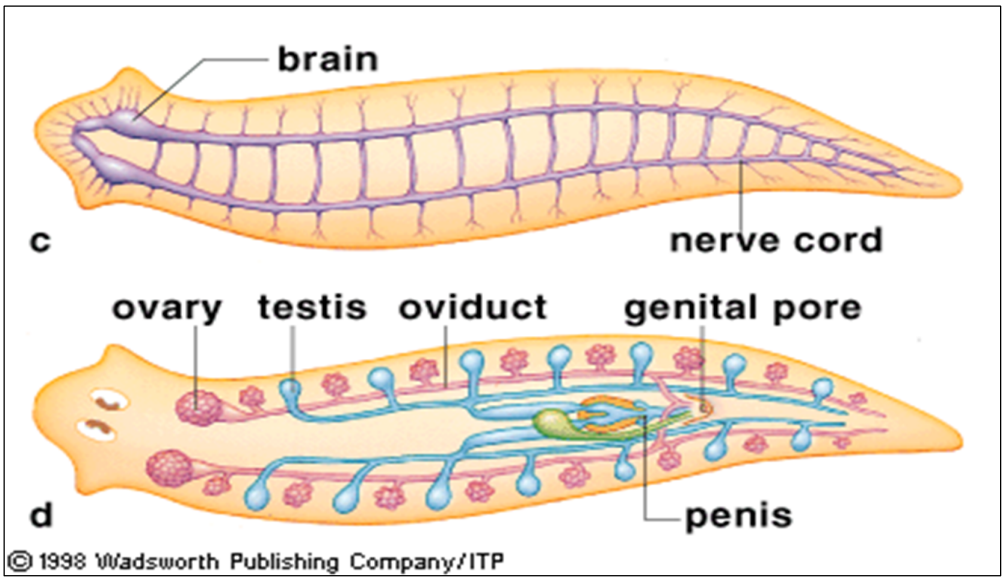
They have nucleated cell body with a cup- shape projection with flagella covering the inner surface of the cup. The beating of these flagella resemble a flame, giving the cell its name. The cup is attached to a tube cell, whose inner surface is also coated in cilia, which help to move liquid through the tube cell. The tube opens externally through a nephron pore. The function of these cells is to regulate the osmotic pressure of the worm and maintain its ionic balance. Microvilli in the tube cell may be used to reabsorb some ions.





Reproductive system of *Planaria*

There are sexual and asexual *Planaria*. Sexual *Planaria* is hermaphrodites, possessing both testicles and ovaries. One of their gametes will combine with the gamete of another *Planaria* , each *Planaria* transports its excretion to other *Planaria,* giving and receiving sperm. Eggs develop inside the body and are shed in capsules. Weeks later the eggs hatch and grow into adult. Sexual reproduction is desirable because it enhances the survival of the species by increasing the level of genetic diversity. In asexual reproduction, the *Planaria* detaches its tail end and each half regrows the lost parts by regeneration, allowing neoblasts (adult stem cells) to divide and differentiate, thus resulting in tow worms. Some species of *Planaria* are exclusively asexual, whereas some can reproduce both sexually and asexually.



Male reproductive system

1. Many of testes, spherical shape in tow side of the body.
2. Vas efferens from each testis, molds in vas deferens then every vas deferens end with seminal vesicle (collect the sperm from the same worm then open in penis).

Female reproductive system

1. Tow ovaries inner the anterior of the body.
2. Tow oviduct molds many of vitellaria. (yolk gland).
3. Atrium then open by genital pore located behind mouth, in genital vacuole there is seminal receptacle its open in the open of Vagina storage the sperms from another worm through copulation.

Hungering and Regeneration in *Planaria*

That worm has faculty to regeneration, when the worm hunger he absorb his inner organs like:

1. Fertilization oviparous.
2. Yolk glands (Vitellaria).
3. Other reproduction organs.
4. Intestine.5- Muscles.

Lost two third size of his body in nine months when the food availability the animal begins to return the lost organs (digested) by regeneration because has neoblasts = Interstitial = Archaeocytes = Adult stem cell.