

B.N.Bandodkar College of Science, Thane
F.Y.B.Sc- Zoology
Course I
LEVELS OF ORGANIZATION
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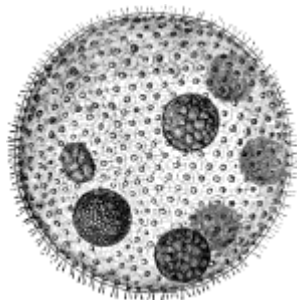
1. Levels of organizations are important in animal classification.
2. Different characters such as cellularity, symmetry, germ layers, segmentation, cephalization etc. Different levels of organization are used to place animals in either; lower or higher categories or groups called as Taxa.
3. The Taxa such as phylum, class, order, family, genus and species are of descending order.

I. Unicellularity vs. Multicellularity:

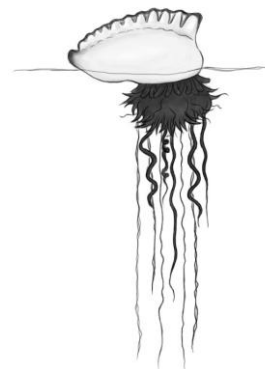
Sr. No.	Unicellular organisms	Multicellular organisms
1.	They are single celled	Many celled
2.	Prokaryotic or eukaryotic	Only eukaryotic
3.	Protoplasmic grade organization	Cellular, tissue and organ level organization
4.	Single cell performs all function of life as metabolism, growth and reproduction	Single cell can't perform all function of life.
5.	Example: Protozoans	Example: Poriferans to Vertebrates

II. Colonization:

1. Colony means an aggregation of the similar type of individuals.
2. When individuals are identical in a colony then it is called as **monomorphic colony** e.g. Volvox colony.
3. In some colonies the individuals are of different structures known as **polymorphic colony** e.g. Physalia colony.



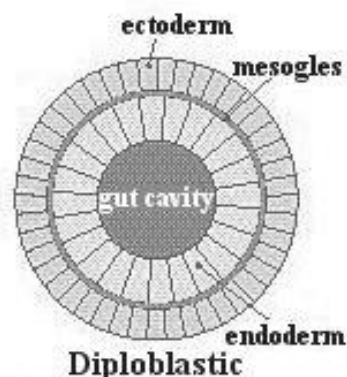
Volvox colony.



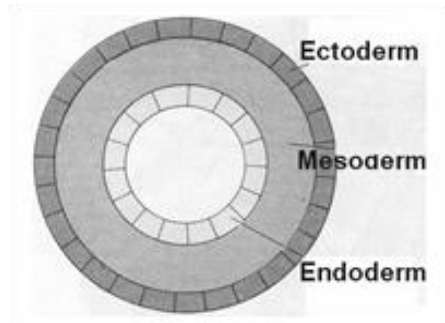
Physalia colony.

When there is a physiological connection between the members of the colony then it is called as a **true colony** e.g. Volvox, sponges etc.

III. Organization of Germ Layers: Diploblastic and triploblastic organisms



1. In Multicellular organisms at the time of formation of embryo the zygote undergoes cellular division called as cleavage.
2. Further multiplication of the cells forms a hollow single layered **blastula**.
3. Blastula then invaginates to give rise to double layered **gastrula**. **The outer germ layer is known as ectoderm and the inner one called endoderm.**
4. When animals develop from such double layered gastrula are known as **diploblastic organisms**.
5. All lower organisms are diploblastic in nature.
6. In higher animals the gastrula develops an additional layer between the ectoderm and endoderm called as mesoderm.
7. Thus they are made up of three germ layers called as **triploblastic organisms**.

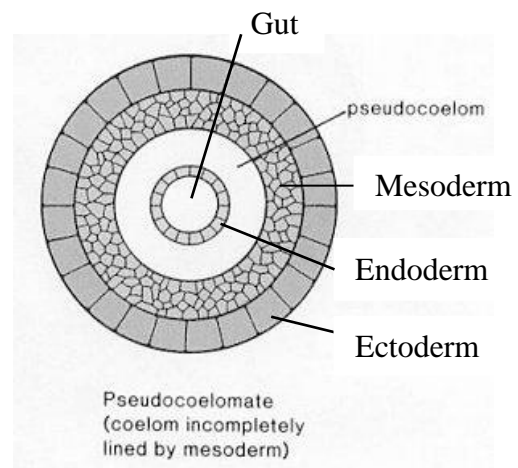
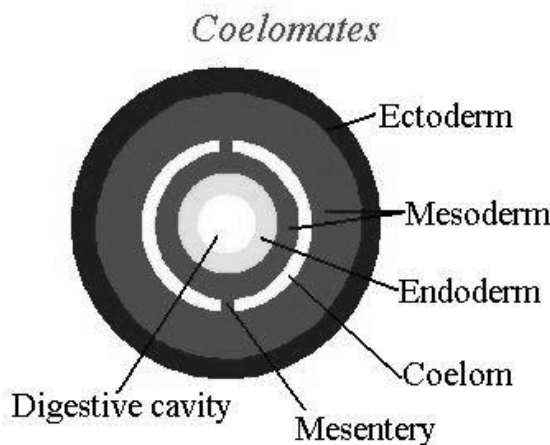
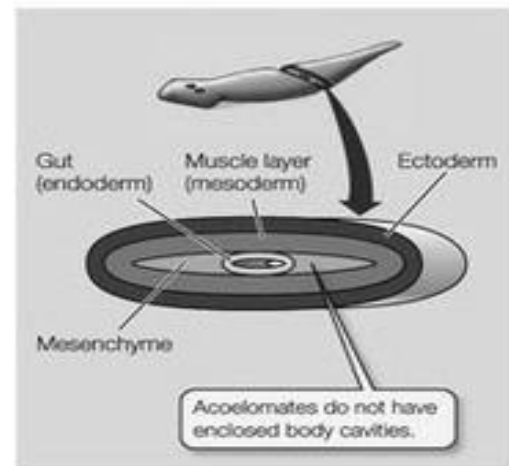


Triploblastic body plan

IV. Development of Coelom:

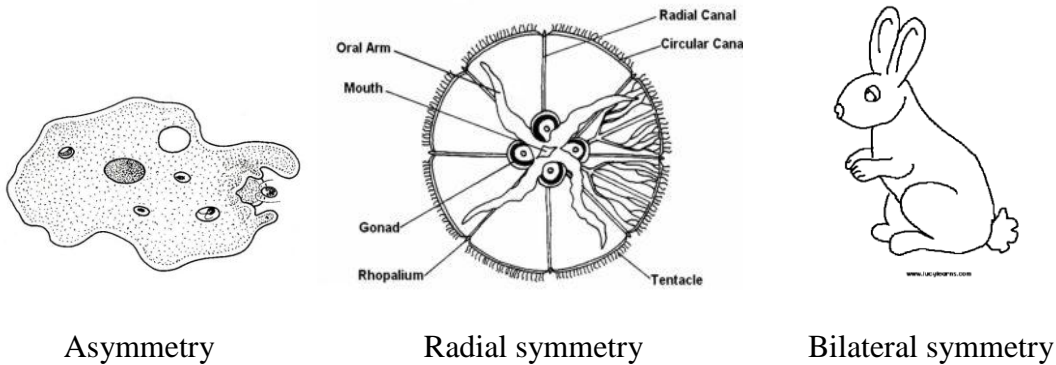
1. Coelom is a body cavity.
2. It is developed in triploblastic animals. In very lower triploblastic organisms there is no body cavity developed therefore they are called as **acoelomates**. E.g. Planaria.
3. In sac worms the cavity which is developed is not lined by mesodermal lining called as **pseudocoelomate** condition. E.g. Ascaris.
4. In higher animals the Coelom is lined by mesodermal lining called as peritoneum and These are called as **coelomates** e.g. earthworm, frog, lizard, man etc.

(A) Acoelomate (flatworm)



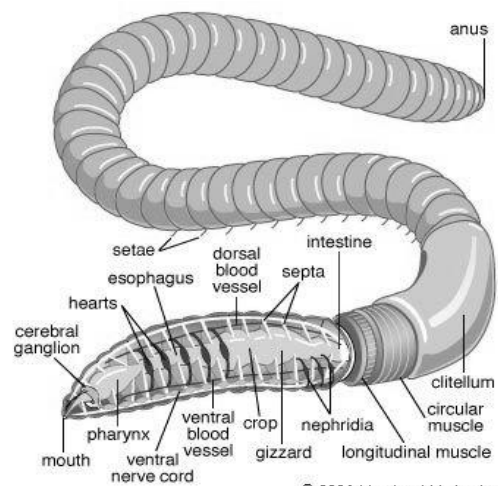
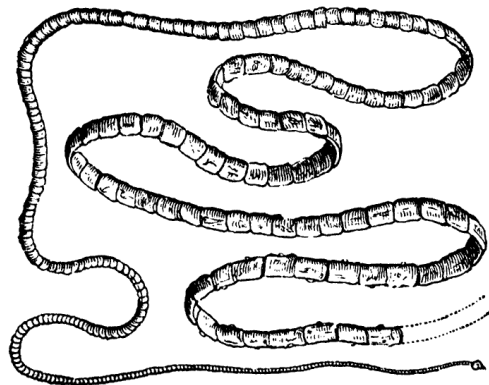
V. Symmetry:

1. Organisms have basically three types of body symmetry namely 1) Asymmetry; 2) Radial symmetry and 3) Bilateral symmetry.
2. Asymmetry: the animals having body which never divides into two equal halves on any plane of their body are **asymmetrical animals**. E.g. the lower animals like Amoeba, and sponges.
3. Radial symmetry: the animals whose body can be divided into two equal halves which are mirror image of each other when cut along any radial plane of body are called as **radially symmetrical animals**.
4. Bilateral symmetry: the animals whose body is divisible into two identical halves which are mirror image of each other are known as **bilaterally symmetrical animals**.
5. But the body is divisible along only a single plane.



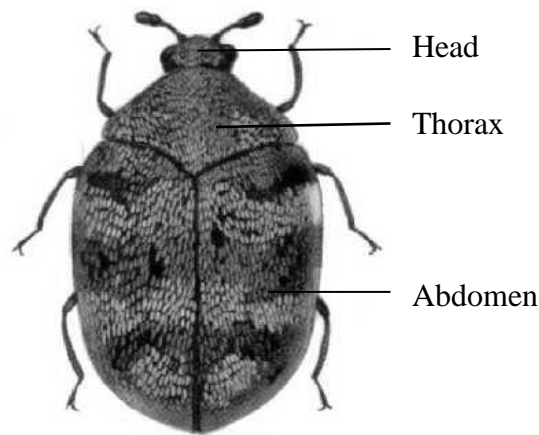
VI. Segmentation:

1. Animal body may be divided or not.
2. When body is divided horizontally into segments is called as segmentation.
3. A segment is called as **mere**.
4. The segment may be true or false types.
5. False segments are superficial, incomplete and non-identical. Phenomenon of false segmentation is called as **pseudo-segmentation** e.g. **tapeworm**.
6. True segments are typical, complete and identical.
7. Each true segment contains part of all the systems like reproductive, digestive, excretory, circulatory, nervous etc. and internally divided by septa.
8. Phenomenon of true segmentation is called as **metamerism** e.g. **earthworm** to vertebrates.



VII. Cephalization:

1. Cephalization means **development of head**.
2. In higher animals all important sensory organs are concentrated towards anterior side as they are **highly active**.
3. Active animals move, run, find food, capture prey or attack enemy anteriorwards. Therefore they require the sensory organs to locate the objects, enemy, food, or prey which are accumulated at anterior part of the body called as head.
4. Head is movable, capable of attacking or capturing prey, eating food, smelling odors or looking for danger.
5. Head contains sensory organs like eyes, antennae, mouth, nose, ears etc. to perform above functions. In higher animals like insects have head which is basically made up of six segments.



Beetle