

Science Class 9 Notes – Diversity in living Organisms

1. Thus different kinds of life forms show great diversity among themselves. For our convenience, we put them into different classes, groups and sub groups on the basis of similarities and differences among them. Eastern Ghats, Western Ghats, Tropical rain forests, Nilgiri mountain range and Himalayas are Biodiversity rich regions of India.

2. What is the Basis of Classification

A whole hierarchy of mutually related characteristics is used for classification. Some important characteristics used for hierarchical classification are

- Presence and absence of nucleus in the cell.
- Body composed of single cell or group of cells.
- Autotrophs (producing own food) and heterotrophs (getting food from outside).
- Development and organisation of different body parts.

These body design features are used to make sub groups among plants and animals.

3. Classification and Evolution

(a) The life forms that we see today have arisen by accumulation of changes in the body design that help the 'organisms to survive in a better way i.e through evolution.

(b) Charles Darwin was a British scientist who gave the Theory of Evolution. He did his research work during a voyage on his famous ship HMS Beagle. He wrote the famous book "The Origin of Species".

(c) The idea of evolution was first given by Charles Darwin (1859) in his book "The Origin of Species".

Primitive organisms – They have ancient body design.

Advanced organisms – They acquired changed body design recently.

Older are simpler while younger are complex. The complexity in design comes during evolution.

4. The Hierarchy of Classification – Groups : Ernst Haeckel (1894), Robert Whittaker (1959) and Carl Woese (1977) classified organisms into kingdoms. Whittaker divided them into 5 kingdoms, Monera, Protista, Fungi, Plantae and Animalia on the basis of their cell structure, mode and source of nutrition and body organisation.

Various levels of classification are –

Kingdom → Phylum (animals)/ Division (plants) → Class → Order → Family → Genus → Species.

Species is the basic unit of classification. The 5 kingdoms of Whittaker are –

A. Monera B. Protista C. Fungi

D. Plantae– They are multicellular eukaryotes with cell walls. They have autotrophic mode of nutrition. All plants are included in this group. Plants are divided into following 5- groups

(i) Thallophyta

(ii) Bryophyta

(iii) Pteridophyta

Thallophytes, Bryophytes, Pteridophytes have naked embryos called spores. They are also called “Cryptogams” because reproductive organs are inconspicuous and there is no seed formation. “Phanerogams” have well developed reproductive tissues. Seeds are formed. Phanerogams are divided into 2 groups –

(a) Gymnosperms (naked seeded).:

(b) Angiosperms (seeds enclosed in fruits).

iv) Gymnosperms (v) Angiosperms

E. Animalia — They are eukaryotic, multicellular and heterotrophic organisms that do not have cell wall. On the basis of extent

and type of body design, they are classified as

(i) Porifera

(ii) Coelenterata

(iii) Platyhelminthes

(iv) Nematoda

(v) Annelida

(vi) Arthropoda

(vii) Mollusca

(viii) Echinodermata

(ix) Protochordata: Notochord is a flexible, rod — shaped body found in the embryos of all chordates. In vertebrates it is replaced by the vertebral column. Notochord helps in the development of nervous system.

(x) Vertebrata :

(i) Presence of notochord

(ii) Presence of dorsal nerve cord

(iii) Triploblastic

(iv) Presence of paired gill pouches

(v) Coelomic body.

Vertebrates are divided into 5 classes :

- Pisces
- Amphibia
- Reptilia
- Ayes
- Mammalia