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Sub. Biology

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1. Discuss how classification systems have undergone several changes over a period of time?

Aristotle was the first person to introduce scientific classification. He used simple morphological characters to classify plants into trees, shrubs and herbs. He also divided animals into two groups, those which had red blood and those that did not.

Linnaeus introduced two-kingdom classification which includes Plantae and Animalia i.e., plants and animals respectively. But this classification did not classify eukaryotes and prokaryotes, unicellular and multicellular organisms, photosynthetic (green algae) and non-photosynthetic (fungi) organisms. Hence this system was found to be less significant as it did not include many more characteristics.

Thus, classification of living organisms underwent several changes. R.H Whittaker introduced five-kingdom classification which includes Monera, Protista, Fungi, Plantae and Animalia. Some characteristics that were included in this classification are - cell structure, body organization, nutrition mode, mode of reproduction and phylogenetic relationship to classify the organisms.

After this, the three-domain system was proposed which divided Kingdom Monera into two domains, leaving the remaining eukaryotic kingdoms in the third domain and thereby a six kingdom classification.

2. State two economically important uses of:

(a) heterotrophic bacteria

(b) archaeobacteria

a) Heterotrophic bacteria are used in the production of vitamins, antibiotics, production of cheese and curd. They help in fixing nitrogen and are used in the formation of Humus.

b) Archaeobacteria is used in the production of Biogas. They are used in bioleaching of mines.

3. What is the nature of cell-walls in diatoms?

In diatoms, cell walls are embedded with silica imparting characteristic patterns onto the walls and are indestructible. Because of this diatoms leave behind large amount of cell wall deposits in their habitat which accumulates to form 'diatomaceous earth'.

4. Find out what do the terms 'algal bloom' and 'red-tides' signify

Algal blooms are found in polluted water. They are the excessive growth of algae, especially blue-green algae (Cyanobacteria). Their growth results in pollution of water. They inhale carbon dioxide and expel out Oxygen.

Rapid multiplication of red-pigmented dinoflagellates such as *Gonyaulax* imparts a red colour to the sea, this phenomenon is called as red tides. These algae produce toxins which kills fish and other aquatic entities.

5. How are viroids different from viruses?

- Viroids are short infectious agents having a single-stranded RNA without protein coat whereas viruses have a single-stranded or double-stranded RNA encapsulated with a protein coat.
- Viroids are very small in size compared to viruses.
- Viroids infect only plants whereas viruses infect both plants, animals and microorganisms.