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NCERT Solutions for 11th Class Biology: Chapter 2- Biological Classification



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NCERT Solutions for 11th Class Biology: Chapter 2-Biological Classification

Class 11: Biology Chapter 2 solutions. Complete Class 11 Biology Chapter 2 Notes.

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Exercises

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

Answer

The classification systems have undergone several changes with time. The first attempt of classification was made by Aristotle. He classified plants as herbs, shrubs, and trees. Animals, on the other hand, were classified on the basis of presence or absence of red blood cells. This system of classification failed to classify all the known organisms.

Therefore, Linnaeus gave a two kingdom system of classification. It consists of the kingdom Plantae and the kingdom Animalia. However, this system did not differentiate between unicellular and multicellular organisms and between eukaryotes and prokaryotes. Therefore, there were large numbers of organisms that could not be classified under the two kingdoms.

To solve these problems, a five kingdom system of classification was proposed by R.H Whittaker in 1969. On the basis of characteristics, such as cell structure, mode of nutrition, presence of cell wall, etc., five kingdoms, Monera, Protista, Fungi, Plantae, and Animalia were formed.

2. State two economically important uses of:

(a) Heterotrophic bacteria

(b) Archaeobacteria

Answer

Two economically important uses of Heterotrophic bacteria are:

→ They help in the production of curd from milk.

→ Many antibiotics are obtained from some species of bacteria.

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Two economically important uses of Archaeobacteria are:

→ Methane gas is produced from the dung of ruminants by the methanogens.

→ Methanogens are also involved in the formation of biogas and sewage treatment.

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

Answer

The cell walls in diatoms are embedded with silica, which makes them indestructible. They form two thin overlapping shells which fit together as in a soap box. Thus diatoms have left behind large amounts of cell wall deposits in their habitat.

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

Answer

Algal bloom refers to an increase in the population of algae or blue-green algae in water, resulting in discoloration of the water body.

Red tides are caused by red dinoflagellates that multiply rapidly. Due to their large numbers, the sea appears red in colour. Toxins released by them can kill other marine species.

5. How are viroids different from viruses?

Answer

Viroids are free RNAs without the protein coat, while virus have a protein coat encapsulating the RNA.

6. Describe briefly the four major groups of Protozoa.

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Answer

The four major groups of Protozoa are:

- Amoeboid protozoans: These organisms live in freshwater, sea water or moist soil. They move and capture their prey by putting out pseudopodia (false feet) as in Amoeba. Marine forms have silica shells on their surface. Some of them, such as Entamoeba are parasites.
- Flagellated protozoans: The members of this group are either free-living or parasitic. They have flagella. The parasitic forms cause diseases such as sleeping sickness. Example: Trypanosoma.
- Ciliated protozoa or ciliates: They are aquatic individuals that form a large group of protozoa. Their characteristic features are the presence of numerous cilia on the entire body surface and the presence of two types of nuclei. All the cilia beat in the same direction to move the water laden food inside a cavity called gullet. Example: Paramecium, Vorticella, etc.
- Sporozoans: They include disease causing endoparasites and other pathogens. They are uninucleate and their body is covered by a pellicle. They do not possess cilia or flagella. They include the malaria causing parasite Plasmodium.

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7. Plants are autotrophic. Can you think of some plants that are partially heterotrophic?

Answer

Some insectivorous plants, like bladderwort and venus fly trap are partially heterotrophic.

8. What do the terms phycobiont and mycobiont signify?

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Answer

Lichens are good examples of symbiotic life of algae and fungi. Phycobiont is the name of the part composed of algae and Mycobiont is the name of the part composed of fungi. Fungi provide minerals and support to the algae, while algae provide nutrition to the fungi.

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9. Give a comparative account of the classes of Kingdom Fungi under the following:

(i) Mode of nutrition

(ii) Mode of reproduction

Answer

→ Phycomycetes- This group of fungi includes members such as Rhizopus, Albugo, etc.

- Mode of nutrition: They are obligate parasites on plants or are found on decaying matter such as wood.
- Mode of reproduction: Asexual reproduction takes place through motile zoospores or non-motile aplanospores that are produced endogenously in sporangium.

Sexual reproduction may be of isogamous, anisogamous, or oogamous type. It results in the formation of thick-walled zygospore.

→ Ascomycetes- This group of fungi includes members such as Penicillium, Aspergillus, Claviceps, and Neurospora.

- Mode of nutrition: They are sporophytic, decomposers, parasitic or coprophilous.

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- Mode of reproduction: Asexual reproduction occurs through asexual spores produced exogenously, such as conidia produced on conidiophores.

Sexual reproduction takes place through ascospores produced endogenously in sac - like asci and arranged inside ascocarps.

→ Basidiomycetes- This group of fungi includes members such as Ustilago, Agaricus and Puccinia.

- Mode of nutrition: They grow as decomposers in soil or on logs and tree stumps. They also occur as parasites in plants causing diseases such as rusts and smuts.

- Mode of reproduction: Asexual reproduction takes place commonly through fragmentation. Asexual spores are absent.

Sex organs are absent but sexual reproduction takes place through plasmogamy. It involves fusion of two different strains of hyphae. The resulting dikaryon gives rise to a basidium. Four basidiospores are produced inside a basidium.

→ Deuteromycetes - This group of fungi includes members such as Alternaria, Trichoderma, and Colletotrichum.

- Mode of nutrition: Some members are saprophytes while others are parasites. However, a large number act as decomposers of leaf litter.
- Mode of reproduction: Asexual reproduction is the only way of reproduction in deuteromycetes. It occurs through asexual spores called conidia.

Sexual reproduction is absent in deuteromycetes.

10. What are the characteristic features of Euglenoids?

Answer

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Characteristic Features of Euglenoids:

- Fresh water organisms found in stagnant water.
- Instead of cell wall they have a protein rich layer called pellicle which makes their body flexible.
- They are autotrophs in the presence of sunlight and heterotrophs in the absence of sunlight.
- A small light sensitive eyespot is present.

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11. Give a brief account of viruses with respect to their structure and nature of genetic material. Also name four common viral diseases.

Answer

Viruses have a protein capsule and genetic materials inside the capsule. These genetic materials become active once they are inside the nucleus of a host cell. They start replicating themselves and in turn spreading the disease.

Generally viruses that infect plants have single stranded RNA. Viruses infecting animals have double stranded RNA or DNA. Viruses which infect bacteria have double stranded DNA.

A.I.D.S, smallpox, mumps, and influenza are some common examples of viral diseases.

12. Organise a discussion in your class on the topic- Are viruses living or nonliving?

Answer

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Viruses are microscopic organisms that have characteristics of both living and nonliving. A virus consists of a strand of DNA or RNA covered by a protein coat. This presence of nucleic acid (DNA or RNA) suggests that viruses are alive. In addition, they can also respond to their environment (inside the host cell) in a limited manner.

However, some other characteristics, such as their inability to reproduce without using the host cell machinery and their cellular nature, indicate that viruses are non-living. Therefore, classifying viruses has remained a mystery for modern systematics.

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