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COLLEGE: MHS DEPARTMENT: MBBS LEVEL: 100

COURSE: BIO102

1. Classify plants according to Eichler’s grouping of 1883

ANSWER

DIVISION CLASS

Thallophyta Phycotinae(Algae), Mycotinae(Fungi)

Bryophyta Hepaticae(Liverworts), Musci(Mosses)

Pteridophyta Psilotinate(Psilotum), Lycopodinae(Lycopodium, Selaginella)

Equisetinae(Horsetails), Filicinae(Fems)

Spermatophyta Gymnospermae(Gymnosperms), Angiospermae(Angiosperms)

2. How are algae of importance to man?

ANSWER

They are harvested for food and cosmetics in the far East

Algae is used as a thickening agent in ice cream and shampoo

Also used as drugs to ward off diseases

They are considered nutritious because of their high protein content

Algae have high Iodine content and can therefore prevent goiter

They are important as food for fish

Brown algae yields Alginic acid which is used to stabilize emulsions and suspensions

3. Describe a unicellular form of algae.

ANSWER

Chlamydomonas represent the unicellular and motile forms of green algae. It is usually found in stagnant water along with other forms. It moves with its flagella. The cell is bounded by cellulose cell wall and contains organelles like nucleus which carries the generic program of the cell, mitochondria for mediating the elaboration of energy molecules, stigma for photoreception, cup-shaped chloroplast pyrenoid which processes manufactured sugar to starch, etc.

4. How does this unicellular alga described in question 3 carry out its reproduction?

ANSWER

Chlamydomonas can reproduce both asexually and sexually. It reproduces **asexually** through mitosis which maintains the quantity and quality of genetic material in the nucleus of the mother cell in that of the daughter cells. It reproduces **sexually** through a process called isogamy where opposite mating strains fuse to form a diploid zygote, which contains two sets of chromosomes. The zygote later undergoes meiosis producing four genetically unique haploid cells that eventually grow into mature cells.

5. Differentiate between the two types of colonial form of algae

ANSWER

**Pandorina** usually occurs in water bloom. The colony consists of 16 cells attached to each other. Each cell has many features in common with chlamydomonas eg nucleus, pyrenoid, flagella and stigma. It produces vegitatively through 4 successive mitotic divisions of each of the 16 cells in the colony therefore producing 16 daughter colonies. Sexually, it reproduces by anisogamous pairing(pairing by flagella ends). Plasmogamy(fusion of cytoplasm) and Karyogamy(fusion of nuclei) occur which is followed by meiosis. The colony may be unisexual or bisexual.

**Volvox** shows more complex form than Pandorina. There are more cells in the colony, number may run into thousands and connected with cytoplasmic strands that run through the cells. Only the larger cells at the posterior ends(gonidia) devide to form new colonies. Other cells remain vegetative throughout the life of the colony. Sexual reproduction in Volvox is oogamous. Sperms are formed by repeated divisions of cells in the colony to form motile sperm platelets containing many sperms. These platelets move to egg colonies where fertilization takes place. Colonies may also be unisexual or bisexual.

6. Define a named complex form of alga

ANSWER

**Fucus** is a genus of brown algae whose species are often found on rocks in the intertidal zones of the sea shores. The plant body is flattened, dichotomously-branched thallus with a mid rib, a vegetative apex, a reproductive apex at maturity, a multicellular disk with which the plant is attached to rock surface, and air bladders which is believed to aid the plant float on the water. It reproduces sexually as sexual reproduction is oogamous. Sex cells are produced in conceptacles which have openings on the surface of the thallus. In the male conceptacles, one of the diploid cells undergoes meiosis, then the meiotic product undergoes many mitotic divisions to produce antheridium having 64 cells of which each cell develops into a biflagellate sperm that swims out of the the conceptacle through the ostioles. In the female conceptacle, similar situation like in the male conceptacle occurs which leads to the production of an 8 celled oogonium – each becomes an egg which is the female sex cell. Motile sperm from the male conceptacles move through the ostiole to the female conceptacle where the eggs are fertilized and diploid zygote are produced. The diploid zygote germinates into a new iploid Fucus plant making the diploid the dominant generation.