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**DEPARTMENT: MBBS**

**COURSE: BIO 102**

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

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| **Division**  | **Class**  |
| **Thallophyta** | **Phycotinae(algae)** |
|  | **Mycotinae(fungi)** |
| **Bryophyta** | **Hepaticae(liverworts)** |
|  | **Musci(mosses)** |
| **Pteridophyta** | **Psilotinate(psilotum)** |
|  | **Lycopodinae(lycopodium,selaginella)** |
|  | **Filicinae(ferms)** |
|  | **Equisetinae(horsetails)** |
| **Spermatophyta** | **Gymnospermae(gymnosperms)** |
|  | **Angiospermae(angiosperms)** |

1. How are algae of importance to man?
2. They serve as food for people and livestock.
3. They serve as thickening agent in ice cream and shampoo.
4. Algae have high iodine content therefore prevent goiter
5. They are nutritious because of their high protein content and high concentration of mineral, trace elements and vitamins.
6. Brown algae yields alginic acid which is used to stabilize emulsions and suspensions; found in products such as syrups, ice cream and paint.
7. Describe a unicellular form of algae

 Chlamydomonas represents the unicellular and motile forms of green algae having two flagella with a cup shaped chloroplast, cellulose cell wall, eyespot (stigma) for photoreceptions to receive light rays. It is found in stagnant water usually along with other forms. Manufactured sugar is processed into starch on the pyrenoid.

1. How does this unicellular algae described in question 3 carry out its reproduction?

In chlamydomonas reproduction can either be vegetative or sexual. Vegetative reproduction results in production of daughter cells in which the amount and quality of genetic material of the nucleus of the mother cell is represented in the daughter cell. In chlamydomonas, a cell about to divide loses its flagella. The cell undergoes mitotic division leading to two nuclei , cell walls are elaborated which diminishes cytoplasm around each nucleus, that is, two daughter cells (zoospores) are released. Increased population of cells in a colony is achieved by repeated mitotic cell divisions.

Sexual reproduction; instead of forming into spores, the haploid daughter cells form gametes that have two different mating strains which are structurally similar and are positive and negative strains. Opposite mating strains fuse in a process called ISOGAMY to form a diploid zygote, which contains two sets of chromosomes. In chlamydomonas, aggregation of cells (clumping) in a colony occurs under favorable conditions. These cell pair by their posterior ends; the pairing is said to be isogamous because the pairing cells (gametes) are morphologically identical. The cytoplasm of the pairing cells fuse (plasmogamy) and the flagella are lost. The two nuclei fuse (karyogamy) this situation is essentially a fertilization process so that the zygote is formed.

1. Differentiate between the two types of colonial forms of algae

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| **Pandorina** | **Volvox**  |
| The colony consists of 16 cells attached to one another by cytoplasmic strands. | The colony consists of thousands of cells connected with cytoplasmic strands. |
| Sexual reproduction is anisogamous. | Sexual reproduction is oogamous. |
| All cells are the same size | There are larger cells in volvox called Gonidia. |
| Plasmogamy and karyogamy occur which is followed by meiosis in sexual reproduction. | No plasmogamy and karyogamy. |

1. Describe a named complex form of algae

**FUCUS**

Fucus are a gene of brown algae whose species are often on rocks in the intertidal zones on the sea shores. The plant’s body is flattened, dichotomously-branched thallus with a midrib, a vegetable apex and a reproductive apex at maturity and a multicellular disk with which plant is attached to rock surface. The plant body has air bladders which is believed to aid the plant to float on the water.