OSAGIE EFE VICTORIA

19/MHS01/361 MBBS BIO102 ASSIGNMENT

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 | Psilotinae (Psilotum)  Lycopodinae (Lycopodium, Selaginella)  Equisetinae (Hoersetails)  Filicinae (Ferns) |
| Spermatophyta | Gymnospermae (Gymnosperms)  Angiospermae (Angiosperms) |

1. How are algae of importance to man?
2. Algae serve as a source of food for fish, livestock, and man.
3. Certain species are used and harvested for the production of cosmetics.
4. It is used as a thickening agent in shampoo and ice cream and also used for making medicine.
5. Algae are considered nutritious because of their high protein content, trace elements and high mineral content. Some algae have high iodine content which prevents goitre.
6. They are a source of chemical extracts used in cosmetic, pharmaceutical and food industries.
7. Brown algae yield alginic acid which is used to stabilize emulsions and suspensions

And can be found in products like syrup, paints and ice cream. Different species of red algae provide agar and carrageen used for the preparation of various gels used in scientific research.

1. Describe a unicellular form of algae.

Chlamydomonas represents the unicellular and motile forms of green algae found in stagnant water usually along with other forms. The flagella structures are for mobility. The cell is bounded to a cellulose cell wall containing organelles such as mitochondria and so on. The nucleus carries the genetic material of the cell. The stigma is for photoreception. The mitochondria mediate the elaboration of energy molecules. Manufactured sugar is processed into starch in the pyrenoid.

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

In Chlamydomonas, reproduction can be sexual or asexual.

Asexual reproduction is by Vegetative reproduction. It results in production of daughter cells in which the amount and quality of genetic material in the nucleus of the mother cell is maintained in the daughter cells. In Chlamydomonas, a cell about to divide loses its flagella. The cell undergoes mitotic division leading to two nuclei, cell walls are elaborated which delimit cytoplasm around each nucleus i.e two daughter cells (zoospores) are released. Increase in the population of cells in a colony is achieved by repeated mitotic divisions.

Sexual reproduction in Chlamydomonas depends on certain environmental conditions e.g lack of nutrients or moisture may trigger the haploid daughter cells to undergo sexual reproduction. Instead of forming into spore, the haploid daughter cells form gametes that have two different mating strains which are structurally similar and positive and negative strains. Opposite mating strains fuse in a process called Isogamy to form a diploid gamete, which contains two sets of chromosomes. After a period of dormancy, the zygote undergoes meiosis which produces four haploid cells that develop into mature cells.

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

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| PANDORINA | VOLVOX |
| Colony consist of 16 cells attached to one another. | Colony number may reach thousands and are connected with cytoplasmic strand throughout the cells. |
| Undergoes asexual and sexual reproduction | Undergoes sexual reproduction |
| Pandorina is less complex | Volvox is more complex because the cells show greater level of differentiation and specialization. |

1. Describe a named complex form of alga.

Fucus, a genus of brown algae whose species are often found on rocks in the intertidal zones of the seashores ( hence the name rock weeds). The plant body is flattened, dichotomously branched thallus with a mid-rib, vegetative apex, a reproductive apex at maturity and a multicellular disk (hold fast) with which plant is attached to rock surface. The plant body also has air bladders which is believed to aid the plant to float on the water. Various species of focus exist; vary in size from a few centimeters to about 2 meters in length.