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**DEPT:** MEDICINE AND SURGERY (MBBS)

1.)    Plants can be classified according to Eichler’s grouping in 1883 as:

|  |  |
| --- | --- |
| **DIVISION** | **CLASS** |
| Thallophyta | Phycotinae( Algae)  Mycotinae( Fungi) |
| Bryophyta | Hepaticae( Liverworts)  Musci( Mosses) |
| Pteridophyta | Psilotinate( Psilotum)  Lycopodinae( Lycopodium, Selaginella)  Equisetinae( Horsetails)  Filicinae( Ferns) |
| Spermatophyta | Gymnospermae( Gymnosperms)  Angiospermae( Angiosperms) |

2.)    Algae has the following importance to man;

- Algae has high iodine content, therefore it helps to prevent goiter in man

- Algae serves as food for people and their livestock

- Algae serves as drugs to ward off diseases

- Different species of algae provide agar and carrageen used for preparation of various gels used in scientific research

- Diatoms have been used in forensic medicine, as their presence in the lungs can indicate a -person died due to drowning

- Certain species of algae are harvested for food and cosmetics in the Far East

- Algae serves as thickening agents in ice cream and shampoo.

**3.)     DESCRIPTION OF A UNICELLULAR ALGAE ( *Chlamydomonas*)**

*Chlamydomonas* is the unicellular and motile forms of green algae. It found in stagnant water usually along with other forms. Flagella are the structures for mobility. The cell is bounded by a cellulose cell wall; contains organelles e.g. nucleus, mitochondria, stigma (eyespot), cup-shaped chloroplast, pyrenoid, vacuole, starch grains, contractile vacuoles. The nucleus carries the genetic program of the cell, the stigma is for photoreception, and the mitochondria mediate the elaboration of energy molecules. Manufactured sugar is processed into starch on the pyrenoid.

**4.0)    HOW *Chlamydomonas* CARRIES OUT ITS REPRODUCTION**

**4.1) VEGETATIVE REPRODUCTION**

It undergoes mitotic division. It is responsible for increase in number of cells in unicellular organisms and for increase in size in multicellular organisms. 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.

**4.2) SEXUAL REPRODUCTION**

In *chlamydomonas,* aggregation of cells (clumping) in a colony occurs under favorable conditions. These cells pair by their posterior (flagellated) ends. This 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 a zygote is formed, the zygote secretes a thick cell wall called a zygospore and may remain dormant in that state for sometimes. After karyogamy sometimes, the zygote undergoes two successive cell divisions, the first division restores the haploid condition by halving the nuclear material in the two resulting nuclei (reduction division) while in the second division, each haploid nucleus undergoes a normal mitotic division. These two divisions which end up with four cells and with n quantity of nuclear material are together known as meiosis. The four products of meiosis are released as haploid zoospores.

**5.)    DIFFERENCES BETWEEN *Volvox* AND *Pandorina***

|  |  |
| --- | --- |
| ***Volvox*** | ***Pandorina*** |
| Shows more complex form than *Pandorina* | Shows less complex form than *Volvox* |
| There are more cells in the colony | There are less cells in the colony compared to that of *Volvox* |
| Sexual reproduction is oogamous | Sexual reproduction is achieved by anisogamous pairing |
| Cells show greater levels of differentiation and specialization | Cells show lesser levels of differentiation and specialization compared to that of *Volvox* |
| *Volvox* is evolutionary more advanced than *Pandorina* with departures between them | *Pandorina* is evolutionary less advanced than *Volvox* |
| The name *Volvox* was not derived from the Pandora’s box | The name *Pandorina* was derived from the Pandora’s box |

**6.)    DESCRIPTION OF A GENUS OF BROWN ALGAE *Fucus***

A genus of brown algae whose species are often found on rocks in the intertidal zones of the sea shores has flattened plant body, dichotomously-branched thallus with a midrib, a 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 plan to float on the water. Various species of *Fucus* exist; they vary in size from a few centimeters to about 2metres in length. They also vary in terms of whether the sex cells are found in the same sexual chamber or in different sexual chambers on different plant bodies.