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COURSE: BIO 102

MATRIC NUMBER: 19/MHS02/062

DEPARTMENT: NURSING

1) Classify plants according to Elchler's grouping of 1883

DIVISION	CLASS
Thallophyta	Phycotinae(algae) Mycotinae(fungi)
Bryophyta	Hepaticae(liverworts) Music(mosses)
Pteridophyta	Psilotinate(psilotum) Lycopodinae(lycopodium,selaginell) Equisetinae(horsetails) Filicinae (ferns)
Spermatophyta	Gymnospermae (gymnosperm) Angiospermae(angiosperm)

2) How are algae of importance to man
   - **Algae used in pisciculture (fish farming)**:
     The industry that is involved in fish farming, also utilizes algae as part of its production process. Studies has shown that numerous species of fish like to consume a variety of types, the most common sources being the blue and green algae. These algae are used in feeding fishes in ponds or fish farming industries.
   - **Algae used in fertilizer:**
     Algae is used in the manufacturing of fertilizers and the two most varieties of algae used in the manufacturing fertilizer are the red and brown algae, they're located near the ocean and liquid fertilizer can be produced using concentrated seaweed extract. The use of algae in fertilizer is to repair levels of nitrogen that is already present in the soil.
   - **Algae used in reclaiming alkaline:**
     In lands that was used to produce large agricultural yields and can no longer be used due to the high concentration of alkalinity in the soil, in order for crops to eventually be grown in these lands, the PH level must

be lowered and the ability of the soil to retain water must be increased. This process can be achieved by using blue-green algae.

- **Algae used as a binding agent:**
  Algae can be used to bind soil together. Algae helps in the healthy formation of soil and it is also important in the protection against natural processes such as erosion.
- Brown algae yield alginic acid which is used to stabilize emulsion and suspensions found in products such as syrup, ice cream and paint.
- It serves as food for people because they are known for their high protein content and are also used as livestock thickening agents in ice cream and shampoo.
- Seaweeds are a source of chemical extract used extensively in the food pharmaceutical, textile and cosmetic products.
- Algae has high iodine content therefore it can be used to prevent goiter.

3) Describe a unicellular form of algae
   Chlamydomonas represents the unicellular and motile forms of green algae, it is found in stagnant water usually along with other forms.
   Flagella are the structures for mobility
   The cell wall bounds the cell organelles e.g the nucleus, mitochondria, eyespot, pyrenoid. e.t.c
   The nucleus carries the genetic programme of the cell
   The stigma for photoreception
   The mitochondria to mediate the elaboration of energy molecules.
   The pyrenoid coverts manufactured sugar to starch

4) **Asexual (vegetative) reproduction in chlamydomonas:**
   This reproduction results in the 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. This type of cell division which maintains the quantity and quality of genetic materials is called mitotic divisions. It is responsible 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. Increase in the population of cells in a colony is then achieved by repeated mitotic divisions.

Sexual reproduction in chlamydomonas:

Chlamydomonas exhibit sexual reproduction under favourable condition i.e the aggregation of cells in a colony. These cells pair by their posterior (flagellated) end, 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 thick cell wall called zygospore and may remain dormant in that state for sometime. After karyogamy sometimes, the zygote undergoes two successive cell divisions the first division restores the haploid condition by halfing the nuclear material in 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) Differentiate between volvox and pandorina

PANDORINA	VOLVOX
Sexual reproduction is anisogamous (pairing by the flagella end)	Sexual reproduction is oogamous i.e The male gamete is motile while the female gamete is immotile.
The colony consists of 16 cells attached to each other.	There are countless cells in the colony.
The colonial form is not a complex structure.	The colonial form is more complex.

6) Describe a named complex form of alga

FUCUS:

This 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, reproductive apex at maturity and a multicellular disk has air bladders which is believed to aid the plant to float on the water. Various species of fucus exist.