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DEPARTMENT:Pharmacy

ASSIGNMENT

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

He classified the plants kingdom the plant kingdom into sub-kingdoms, they are cryptogamae and phanerogamae.

Cryptogamae (Gk. Kryptos: concealed; gamos: marriage): the cryptograms are flowerless and seedless plants. They are simple plants like algae, mosses and ferns which do not produce flowers, fruits and seeds. They are considered as lower plants.

Phanerogamae: phanerogams are also known as spermatophytes (sperma: seed; phyton: plant) and are seed bearing plants. They are known as higher plants because the plant body is differentiated into roots, stems and leaves, with a well developed vascular system. Examples of phanerogams are gymnosperms and angiosperms.

2. How are algae of importance to man?

Algae are of importance to man because:

Certain species of algae can be harvested for food for man and livestock. This is due to the fact that they're considered nutritious because of their high protein content and vitamins.

They can be used as thickening agents in ice cream and shampoo.

Certain species of algae can be harvested for cosmetics in the Far East.

3. Describe a unicellular form of algae

Chlamydomonas represents the unicellular as well as motile forms of green algae. It is found in stagnant water with other forms. The cell is bounded by a cellulose cell wall which contains organelles such as nucleus, mitochondria, stigma, chloroplast (cup-shaped) pyrenoid etc.

The nucleus carries the genetic material of the cell

The stigma is present for photo-reception

The mitochondria acts as the powerhouse of the cell by mediating the elaboration of energy molecules.

Manufactured sugars are processed into starch in the pyrenoid. Flagella is also present in chlamydomonas which are the structures of mobility. Chlamydomonas

can undergo both sexual and vegetative (asexual) reproduction, in which the vegetative reproduction results in the production of daughter cells, with the same amount and quality of genetic material as those in the ones in the mother cell. On the other hand, the sexual reproduction involves the union of sex cells to undergo plasmogamy and karyogamy, which results in a diploid zygote.

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

Reproduction in *Chlamydomonas* can either be sexual or vegetative (asexual) reproduction.

Vegetative (asexual) reproduction results in the production of daughter cells with the same amount and quality of genetic material as the single nucleus of the mother cell. This means that if the number of genetic material in the mother cell. This type of cell division is called mitotic divisions. In this process, the *Chlamydomonas*, a cell that is about to divide loses its flagella and undergoes mitotic division to form two nuclei, cell walls are elaborated which delimit cytoplasm around each nucleus therefore two daughter cells (zoospores) are released.

Sexual reproduction occurs under certain environmental conditions (eg lack of nutrient or moisture), which can trigger the haploid daughter cells to undergo sexual reproduction. Instead of forming into spores the haploid daughter cells form gametes that have two different mating strains (negative and positive strains) which fuse together in a process called isogamy to form a diploid zygote

5) Pandorina has features in common with *Chlamydomonas* while *Volvox* shows more complex form than *Pandorina* due to a greater level of differentiation and specialization.

Pandorina colony consists of 16 cells attached to one another while in *Volvox* there are more cells in the colony which may run into thousands and are connected with cytoplasmic strands that run through the cells

vegetative reproduction in *Pandorina* is achieved through 4 successive mitotic divisions of each of the 16 cells in the colony to produce 4 daughter colonies while in *Volvox* not all cells but the larger cells at the posterior end are the ones that divide to form new colonies.

sexual reproduction in *Pandorina* is achieved by anisogamous pairing, where single cells assume genetic functions and paired by their flagellated ends while sexual reproduction in *Pandorina* is oogamous which is achieved when the sperm platelets formed by the sperm cells move to the egg colonies where fertilisation occurs.

pandorina colony maybe unisexual in some species or bisexual while colony of volvox can either be unisexual or bisexual.

6.) A complex form of alga is a genus of brown algae fucus, whose species are found on rocks in the intertidal zones of seashore. The plant body is flattened dichotomously-branched thallus with a holdfast, vegetative apex, a reproductive apex (at maturity) and a multicellular disk. This multicellular disk enables the plant to attach itself to the rock surfaces.

The plant body also has air bladders which is believed to aid the plants float in water.

Various species of fucus exist but they vary in size from a few centimeters to about 2 meters in length. In addition, they also vary in terms of whether sex cells are found in the same sexual chambers on different plant bodies.

They undergo sexual reproduction, which is oogamous where the motile sperms from the antheridium move through the ostiole into the female conceptacle where the eggs are fertilised and diploid zygotes are formed.