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19/MHS01/032

COLLEGE OF MEDICINE AND HEALTH SCIENCES

MEDICINE AND SURGERY

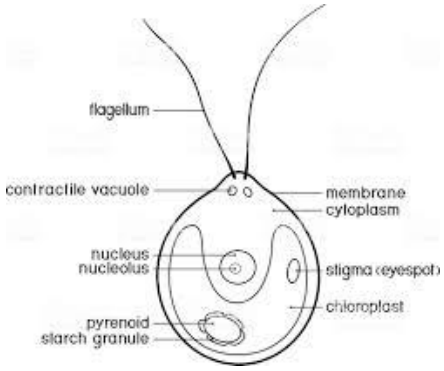
BIO 102

ASSIGNMENT

1) Classify plants according to Eichler's grouping of 1883.
   According to Eichler's grouping of 1883 plants are classified as follows;

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) How are algae of importance to man?
   The algae are important to man in the following ways;
   a) Algae serves as food for people when certain species are harvested.
   b) It serves as thickening agent used in shampoo as well as drugs to ward of diseases.
   c) They possess high iodine content and hence prevent goitre.
   d) Different species of red algae provide agar and carrageen used in the preparation of various gels used in scientific research by man.
   e) They are a source of nutrition in man's diet due to their high protein content, high concentration of minerals, trace elements and vitamins.
3) Describe a unicellular form of algae.
   A unicellular form of algae is **Chlamydomonas**. This is a motile form of green algae which is found in stagnant water usually along with other forms. They possess flagella for mobility. The cell is bounded by a cellulose cell wall; contains organelles e.g. nucleus, mitochondria, stigma, cup-shaped chloroplast and pyrenoid etc. The nucleus carries the genetic programme of the cell; the stigma is for photoreception; the mitochondria mediate the elaboration of energy molecules; manufactured sugar is processed into starch on the pyrenoid.



4) How does this unicellular alga described in question 3 carry out its reproduction?
In Chlamydomonas, reproduction can either be vegetative (asexual) or sexual.
Vegetative reproduction leads to the production of daughter cells in which the amount and quality of genetic material in the nucleus of the mother cell is the same as those in the daughter cells. Hence the daughter cell has the same genetic composition as the mother. Thus they are identical. The cell is therefore said to undergo mitotic divisions. When a cell is about to divide in Chlamydomonas it 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.
Under certain environmental conditions e.g. absence of moisture may cause the haploid daughter cells to undergo **Sexual reproduction**. Rather than developing into spores the daughter cells which are haploid 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. After a **period of dormancy**, the zygote undergoes meiosis. This cell division produces four genetically unique haploid cells that eventually grow into mature cells. This mode of reproduction involves fusion of gametes.

5) Differentiate between the two types of colonial form of algae.

Differences between Pandorina and Volvox	
Pandorina	Volvox
Consists of 16 cells attached to each other.	More complex hence there are more cells in the colony.
Undergoes anisogamous pairing (pairing by the flagella ends) in sexual reproduction.	Undergoes oogamous pairing (the male gamete is motile while the female is not).
Undergoes both vegetative and sexual reproduction.	Undergoes only sexual reproduction.

6) Describe a named complex of algae.
An example of complex algae is Fucus. It 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, a reproductive apex at maturity and a multicellular disk 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 fucus exist; vary in size from a few centimetres to about 2 metres in length. They also vary depending on where the sex cells are found.