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QUESTION 1

Classify plants according to Eichler's grouping of 1883.

Answer

DIVISION	CLASS
Thallophyta	Phycotinae (Algae) Mycotinae (Fungi)
Bryophyta	Hepaticae (Liverwort) Musci (Mosses)
Pteridophyta	Psilotinate (Psilotum) Lycopodinae (Lycopodium, Selaginella) Equisetinae (Horsetails) Filicinae (fems)
Spermatophyta	Gymnospermae (gymnosperms) Angiospermae (Angiosperms)

QUESTION 2

How are algae of importance to man?

Answer

Algae are economically important to man in a variety of ways. They serve as food for fish. It serves as food for people and livestock, thickening agents in ice cream and shampoo, drugs to ward of diseases. Algae are considered nutritious because of their high protein content and high concentration in minerals, trace elements and vitamins. Algae have high iodine content therefore prevents goiter. Seaweeds are source of three chemical extracts used extensively in the food, pharmaceutical, textile and cosmetic industries.

QUESTION 3

Describe a unicellular form of algae.

Answer

Unicellular algae are autotrophs and contains chlorophyll i.e. (manufactures its own food through photosynthesis). A good example of a unicellular algae is ***chlamydomonas***. Chlamydomonas is a unicellular and motile form of Green Algae. It is 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 etc. The stigma is for photoreception. The mitochondria is mediate the elaboration of energy molecules. Manufactured sugar is processed into starch on the pyrenoid.

QUESTION 4

How does this unicellular algae described in question 3 carry out its reproduction?

Answer

In chlamydomonas, reproduction can either be asexual or sexual.

In Asexual reproduction (vegetative), four daughter cells are produced and the same genetic material in the nucleus of the mother is the exact with the daughter cells. This kind of division is known as the mitotic cell division. In chlamydomonas, a cell divide loses its flagella. The cell undergoes mitotic cell 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 population of cells in a colony is achieved by repeated mitotic division while in Sexual reproduction, instead of forming into spores, the haploid daughter cells 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. The zygote undergoes meiosis, a type of division that reduces the genetic content of a cell by half. In this type of division (meiosis) four genetically unique haploid cells that eventually grow into mature cells. In chlamydomonas, aggregation of cells (clumping) in a colony occurs under favourable conditions. These cells pair their posterior (flagellated) ends. This pairing is said to be Isogamous because the pairing cells (gametes) are morphologically identical. Two cells each with n quantity of genetic material (i.e. haploid nuclear material) undergo karyogamy (fusion of nuclei) to produce single cell with 2n (diploid) nuclear material. The zygote secretes 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 nuclei (reduction division) while in the second division each haploid nucleus undergoes a normal mitotic division. These two divisions which end up with four daughter cells and with n quantity of nuclear material are together known as meiosis. The four product of meiosis are released as haploid zoospores.

QUESTION 5

Differentiate between the two colonial forms of algae

Answer

Pandorina	Volvox
It is a genus of green algae	It is more complex than Pandorina
Sexual re production is Anisogamous	Sexual reproduction is Oogamous
It has a unicellular motile thallus	It has a multicellular motile thallus

QUESTION 6

Describe a named complex form of algae.

Answer

An example of a named complex algae is ***FUCUS***. It is a genus of the brown algae which can be found in the rocks of the sea shores. The body of the plant is flattened, dichotomously-branched thallus with a midrib. The body has air bladders which aids the plant to float. It varies in size from a few centimeters to about 2 meters in length.