

Plant Diversity.

Bio 102 Assignment

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① Classify plant according to Ficher's grouping of 1863.

Plant Kingdom	Division	Class
	Thallophyta	Phycotinae (Algae) Mycotinae (Fungi)
	Bryophyta	Hepatinae (Liverworts) Musci (Mosses)
	Pteridophyta	Psilotinae (Psilotum) Lycopodiinae (Lycopodium, Selaginella) Equisetinae (Horsetails) Filicinae (Ferns)
	Spermatophyta	Gymnospermae (Gymnosperms) Angiospermae (Angiosperms)

② How are algae important to man?

Answer:

- It serves as food for people and livestock.
- It has high iodine content and therefore prevent goitre.
- It is used as thickening agents in ice cream and shampoo.
- It is used as drugs to ward off diseases.
- Brown algae yield alginic acid which is used to stabilize emulsions and suspensions found in products like Syrup, ice cream and paint.

3) Describe the unicellular form of algae.

~~The~~ Chlamydomonas represents the unicellular and motile forms of green algae. It is found in stagnant water usually with other forms. Flagella is used for mobility. It is bounded by a cellulose cell wall; contains organelles such as nucleus, mitochondria, stigma (eyespot), cup-shaped chloroplast, pyrenoid etc. However, the nucleus carries the genetic programme of the cell, the stigma is for photoreception. Mitochondria mediate the elaboration of energy molecules. Manufactured sugar is processed into starch on the pyrenoid.

4) How does the unicellular algae described in Question 3 carry out its reproduction.

Chlamydomonas - Reproduction

It can either be vegetative (asexual) or sexual.

Asexual: 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. The two daughter cells are released.

Sexual: These cells pair by flagellated ends. This pairing is said to be isogamous because the pairing cells are morphologically identical. The cytoplasm of the pairing cells fuse (plasmogamy) and the flagella are lost. The two nuclei fuse in a situation which is essentially a fertilization process. So a zygote is formed. The zygote secretes a wall called zygocarp and may remain dormant in that state for some time. After karyogamy, the zygote undergoes two successive cell divisions. The first division restores the haploid condition by splitting the nuclear material into two resulting nuclei while in the second division each haploid nucleus undergoes a normal mitotic division.

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

Answer:

Pandorina

- (i) sexual reproduction is isogamous
- (ii) the colony consist of 16 cells attached to one another.

Volvox

- (i) sexual reproduction is oogamous.
- (ii) the colony consist of cells that may run into thousand and are connected by cytoplasmic strands.

6) Describe a named complex form of algae.

Answer:

Fucus: A genus of brown algae whose species are found on rocks in the intertidal zones of the seashore, the plant body is flattened, dichotomously-branched thallus with a midrib, 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 float on water.