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19/MH001/105
MBBS
BIO 103
GENERAL BIOLOGY II

1) Classify plants according to Fisher's grouping of 1888

THE PLANT KINGDOM

Division	Class
Thallophyta	Phycetinae (Algae) Mycetinae (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?

→ They serve as food for man.
→ They serve as a thickening agent in icecream and shampoo.
→ They serve as a source of vitamin in man.
→ They help in producing drugs to ward off disease in man.
→ They contain high concentration of minerals and trace elements. E.g. Iodine content to prevent goitre in the body.

3) Describe a unicellular form of algae

→ An example of a unicellular form of algae is Chlamydomonas.
→ 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 (eye-spot), cup-shaped chloroplast, etc.

→ The stigma is for photoreception.

→ The nucleus carries the genetic programme of the cell.

→ The mitochondria mediate the elaboration of energy molecules.

→ Manufactured sugar is processed into starch on the pyrenoid.

4. How does this unicellular algae described in 3, carry out its reproduction.

It is either by vegetative (asexual) or sexual reproduction

i) Vegetative reproduction

It results to 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. Mitotic division maintains the quality and quantity of genetic material and also increase in number of cells in unicellular organisms and sizes in multicellular/colonial organisms, as cells about to divide loses its flagella, then undergoes mitotic division leading to two nuclei, cell-walls are elaborated which delimit cytoplasm around each nucleus i.e two daughter cells are released.

ii) Sexual reproduction

In chlamydomonas, aggregation of cells in a colony occurs under favourable conditions. The cells pair by their posterior ends, called Isogamous because the gametes are morphologically identical. The cytoplasm of the pairing cells fuse and the flagella are lost. The two nuclei fuse, a fertilization process so that the zygote is formed. The zygote secretes a thick wall called zygospore and may remain dormant in that state for sometimes. After karyogamy sometimes, the zygote undergoes two successive divisions, the first restores the haploid condition by halfing the nuclear material to 2 resulting nuclei, while the second, each haploid nuclei undergoes a normal mitotic division. These two divisions which end up with four cells and with a quality nuclear material are together known as meiosis.

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

PANDORINA

This is a genus of green algae composed of 8, 16 or sometimes 32 cells, held together at their bases to form a sack globular colony surrounded by mucilage. Asexual reproduction is by simultaneous division of all cells of the colony to form a tiny colonies that are liberated by a gelatinization of the colonial envelope. Sexual reproduction occurs by division by each cell of the colony into 16-32 zoogametes.

WHILE

VOLVOX

This shows more complex form than pandorina. There are more cells in the

Colony number may run into thousands and connected with cytoplasmic strands that run through the cells. Only larger cells form new colonies. Other cells remain vegetative throughout the life of the colony. Sexual reproduction is oogamous. The colonies may either be unisexual or bisexual.

(6) Describe a named complex form of algae.

→ The named complex form is Fucus.

→ It is found on rocks in the intertidal zones of the sea shores.

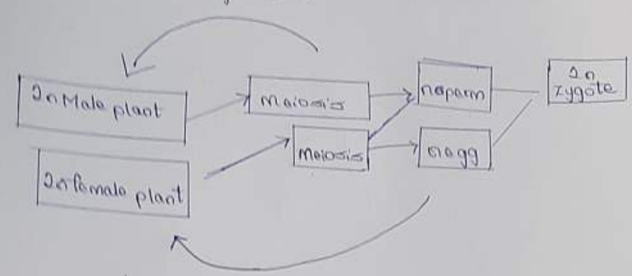
The plant body is flattened, dichotomously branched thallus with a midrib,

→ vegetable apex, multicellular disk with which plant is attached to rock surface.

Sexual reproduction is oogamous, sexes are produced in conceptacles

→ which have openings (ostioles) on the surface of the thallus.

The diploid zygote germinates into a new diploid Fucus plant making the diploid the dormant generation.



LIFE CYCLE OF FUCUS sp.