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1. Plants according to Eichler's grouping of 1883.

Division	Class
Thallophyta	Phycothine (Algae) Mycotinae (Fungi) Hepaticeae (Liverworts) Musci (Mosses)
Bryophyta	Pellotinae (Bilateria) Lycopodiinae (Lycopodium, Selaginella) Equisetinae (Horse tails) Filicinae (Ferns)
Psittacophyta	Gymnospermae (Gymnosperms) Angiospermae (Angiosperms)
Spermatophyta	

2) Importance of Algae

- i) Indicators of environmental problems in aquatic ecosystems.
- ii) Brown algae yield alginic acid which is used to stabilize emulsions and suspensions.
- iii) Algae are important as food for fish.
- iv) It serves as food for people and livestock, thickening agents in ice cream and shampoos, drugs to ward off diseases.
- v) Seaweeds are source of three chemical extracts used extensively in the food, pharmaceutical, textile and cosmetic industries.
- vi) Bacteria, fungi and cell cultures are commonly grown on agar gels.
- vii) Algae have high iodine content therefore prevent goitre.

2)

Unicellular Form of Algae

Chlamydomonas represents the unicellular and motile forms of green algae. 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 eg nucleus, mitochondria, stigma (eyespot), cup-shaped chloroplast, 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. Reproduction in Chlamydomonas

In Chlamydomonas, reproduction can either be vegetative (asexual) or sexual.

Vegetative reproduction results in 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. Thus, if the amount of genetic material in the mother cell nucleus is n , the daughter cells also have n quantity of genetic material.

The kind of cell division which maintains the quantity and quality of genetic material is called mitotic divisions. It is responsible for increase in size in multicellular organisms. In Chlamydomonas, 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. i.e. two daughter cells (zoospores) are released. Increase in the population of cells in a colony is achieved by repeated mitotic divisions.

Sexual Reproduction

Sexual reproduction involves union of sex cells (gametes). In Chlamydomonas, aggregation of cells (clumping) in a colony occurs under favourable conditions. These cells pair by their posterior (flagellated) ends. This pairing is said to be isogamous because the pairing cells (gametes) are morphologically identical. The cytoplasm



of the pairing cells fuse (plasmogamy). At first the flagella are lost. The two nuclei fuse (karyogamy), this situation is essentially a fertilization process so that a zygote is formed. In other words, two cells each with a quantity of nucleus (genetic) material (i.e. haploid nucleus material) undergo karyogamy (fusion of nuclei) to produce a single cell with 2n (diploid) nuclear material. The zygote secretes three cell walls called a zygospore and may remain dormant in that state for sometime.

5. Navox Pantelonia
i) Number of cells may run into thousands. The colony consists of 16 cells.
ii) Sexual reproduction is oogamous. It is achieved by anisogamous pairing.

6. Complex Form of Alga (Fucus)
A genus of brown algae whose species are often found on rocks in the intertidal zone of the sea shores. The plant body is flattened, dichotomously-branched thallus with a midrib, a vegetative apex (a reproductive apex at maturity) and a multicellular disc (holdfast) with which plant is attached to rock surface. The plant body also has air bladder 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.