PAGE 1

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THE PLANT KINGDOM

1)

DIVISION	CLASS
Thallophyta	Phycomycetes (Algae)
	Mycetinae (Fungi)
Bryophyta	Hepaticae (Liverworts)
	Musci (Mosses)
Pteridophyta	Psilotinae (Psilotum)
	Lycopodinae (Lycopodium, [illegible])
	Equisetinae (Horse tails)
	Filicinae (Ferns)
Spermatophyta	Gymnospermae (Gymnosperms)
	Angiospermae (Angiosperms).

2) (i) Algae are considered nutritious because of their high protein content and high concentration of minerals, trace element and vitamins

(ii) Algae have high protein content therefore prevent goitre

(iii) Different species of red algae provide agar

and carrageen used for the preparation of various gels used in scientific research

(v) Algae also serves as thickening agent in ice cream and drug preparation to avoid dehydration

(vi) Algae have been surveyed for anticancer compounds with several cyanobacteria appearing to contain promising candidates

(3) A unicellular form of algae is the chlamydomonas. The chlamydomonas represents the unicellular and motile forms of green algae. It is found in stagnant water usually along with other forms. It also possesses the flagella which it uses for mobility. The cell is bounded by a cellulose cell wall which contains organelles e.g nucleus, mitochondria, stigma (eyespot), cup-shaped chloroplast, pyrenoid etc. The nucleus carries the genetic programme of the cell, the stigma is used for photoreception, the mitochondria mediate the elaboration of energy molecules. Many produced sugar is processed into starch in the pyrenoid.

(4) In chlamydomonas reproduction can either be vegetative (asexual) or sexual.

Vegetative reproduction:

This 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. This kind of cell division is called mitosis. It is responsible for increase in number of cells in unicellular organisms and for increase in size in multicellular organisms. In chlamydomonas, a cell absorbs its flagella. The cell undergoes mitotic division leading to two nuclei, cell walls are elaborated with distinct 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 division.

Sexual reproduction:

Certain environmental conditions e.g lack of nutrient or moisture may trigger the haploid daughter cells to undergo 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. After a period of dormancy, the zygote undergoes meiosis, a type of cell division that reduces the genetic content of a cell by half. In chlamydomonas aggregation of cells 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) and the flagella are lost. The two nuclei fuse (karyogamy), this situation is just a fertilization process so that a zygote is formed. The zygote secretes thick cell wall called a zygospore and may remain dormant in that state for sometime. After karyogamy sometimes the zygote undergoes two successive cell divisions the first division restores the haploid condition by halving the nuclear material into two resulting nuclei (reduction or division) while in the second division each haploid nucleus undergoes a second mitotic division. These two division which end

up with four cells and with a quantity of a nuclear material are together known as meiosis. The four products of meiosis are released as haploid zoospores.

5)

PANDORINA	VOLVOX
(a) The colony consists of 16 cells attached to one another.	There are more cells in the colony number may run into thousands and connected with cytoplasmic strands that run through the cells
(b) They are not that advanced when compared to Volvox	They are more advanced than Pandorina with the departures between them especially as the cells show greater levels of differentiation

6) FUCUS: It is also called rockweed, genus of brown algae, common on rocky sea coasts and in salt marshes of northern temperate regions. The plant body is flattened, dichotomously branched

thallus with a midrib, a vegetative apex at maturity and a
multicellular disk (holdfast) with which plant is attached
to a 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
centimeters to about 2 metres in length