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### BIO 102 ASSIGNMENT

1. A system of plant taxonomy, Eichler system was the first phylogenetic [phyletic] or evolutionary system. He gave system of classification for the whole plant kingdom. Eichler classified the plant kingdom into two sub-kingdoms. They are cryptogamae and phanerogamae.

A. cryptogamae are flowerless and seedless plants. They are simple and flowerless plants like algae, mosses and ferns which do not produce flowers, fruits and seeds. Cryptogams are considered as lower plants. (B) phanerogamae are seed-bearing plants, also known as spermatophytes. There are higher plants. The plant body is differentiated into roots, stems and leaves with well-developed vascular system. Examples are angiosperms and gymnosperms. Also classified them as: Thallophyta

Phycotinae (Algae) Mycotinae (Fungi)

Bryophyta Hepaticae (Liverworts) Musci (Mosses)

Pteridophyta

Psilotinae (Psilotum) Lycopodiinae (Lycopodium, Selaginella) Equisetinae (Horsetails) Filicinae (Ferns)

Spermatophyta Gymnospermae (Gymnosperm) Angiospermae (Angiosperm)

2a.) Algae help to prevent goitre due to their high iodine content.

B.) Brown algae produce alginic acid which is used to stabilize emulsions and suspensions; found in products such as syrup, ice cream and paint.

C.) Species of red algae yield agar and carrageen used for the preparation of various gels used in scientific research.

D.) Diatoms have been used in forensic medicine, as their presence in the lung indicates if a person died due to drowning.

E.) Used as shampoos, for medicine and fertilizer.

3.) Chlamydomonas represent the unicellular and motile forms of algae (green algae to be precise). They are found usually in stagnant water along with other forms of algae. Chlamydomonas uses flagella as structures for movement. The cell of a Chlamydomonas is bounded by a cellulose cell wall; contains various organelles e.g. nucleus, mitochondria stigma (eyespot), cup-shaped chloroplast, pyrenoid etc. the nucleus carries the genetic programme of the cell. The eyespot is for photoreception, chloroplast for photosynthesis, mitochondria mediate the elaboration of energy molecules.

4.) VEGETATIVE (ASEXUAL) REPRODUCTION: This type of reproduction occurs during favourable conditions. Vegetative reproduction in Chlamydomonas results in production of daughter cells in which the amount (quantity) 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 mother cell nucleus is  $n$ , the daughter cells also have  $n$  quantity of genetic material. The kind of cell division which

maintains the quality and quantity of genetic material is called mitotic division. It is responsible for increase in number of cells in unicellular organisms and for increase in size in multicellular organism. In *Chlamydomonas*, a cell about to divide loses its flagella. The cell will then undergo mitotic division leading to two nuclei, cell walls are elaborated which delimit cytoplasm around each nucleus i.e, two daughter cell.

4b.)sexual reproduction through isogamy, anisogamy or oogamy. It involves do union of sex cells. Sexual reproduction has to do with karyogamy and plasmogamy and at the end it produces 4 daughter cells with half the number as their parents.

5.Difference between *Volvox* and *Synura*.

A.*Volvox* reproduces both sexual and asexual while *Synura* reproduction is sexual

B.Spherical colonies of up to 50,000 cells while *Synura* has only few cells in its colonies

6.)(a genus of brown algae) known as *Fucus*. A genus of brown algae whose species are often found on rocks in intertidal zones 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 disk (hold fast) with which plant is attached to 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 centimetres to about 2metres in length. They also vary in terms of whether the sex cells are found in the same sexual chamber or in different sexual chambers on different plant bodies. Sexual reproduction is oogamous, sex cells are produced in conceptacles which have openings (ostioles) on the surface of the thallus. In the male conceptacles, one of the diploid cells from outgrowth of the wall of the conceptacles undergoes meiosis, the meiotic product undergoes many mitotic divisions to produce

antheridium having 64 cells of which each cell develops into a biflagellate sperm that swims out of the conceptacle through the ostiole. In the female conceptacle, similar to the situation in the male conceptacle, leads to the production of an 8 celled oogonium -each becomes an egg which is the female sex cell. Motile sperm cell from the antheridium move through the ostiole into the female conceptacle where the eggs are fertilized and diploid zygote are produced. Apart from the antheridia and oogonia, sterile multicellular filaments (paraphyses) are also produced in the conceptacles which are dispersed among the antheridial and oogonial outgrowths and at the entrance into the conceptacles. The diploid zygote germinates into a new diploid *Fucus* plant making the diploid the dominant generation .