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**MATRIC NO: 19/MHS11/083**

**Biology assignment**

1. Classify plants according to Eichlers grouping of 1883

In 1883 A.W. Eichler gave a system of classification for the whole plant kingdom.

He classified the plant kingdom into two sub kingdoms Cryptogamae and phanerogamae

1. Cryptogamae
2. Algae
3. Bryophytes
4. Pteidophta
5. Phanerogamae
6. Gymnospermes
7. Angiospemae
8. How are algae of importance to man
9. They serve as food for sea animals and fishes
10. They are high in mineral content: High mineral content, up to five percent of the wet material, in which all the mineral elements important in human and animal physiology are found, Makes Sea weeds a unique supplement for a well-balanced diet.
11. Manufacture of iodine:

The World’s iodine supply is fulfilled from the sea weeds. Since a century back the iodine manufacture is in progress. Iodine is used in several ways.

1. Manufacture of soaps and alums: By burning sea weeds on the sea coast, the alkalis are prepared from sea weed ashes. These alkalis are employed in the manufacture of soaps and alums.
2. Used as fertilizers: Due to the presence of potassium chloride (KC1) in sea weeds, they are used as fertilizers in many countries, The sea weed manure also increases resistance to disease.
3. Describe a unicellular form of algae

Diatoms are single celled algae. **Diatom**, belong to the algal class Bacillariophyceae (division Chromophyta). Diatoms are among the most important and [prolific](https://www.merriam-webster.com/dictionary/prolific) microscopic sea organisms and serve directly or indirectly as food for many animals. Diatoms may be either unicellular or colonial. The [silicified](https://www.britannica.com/science/silica-mineral) [cell wall](https://www.britannica.com/science/cell-wall-plant-anatomy) forms a pillbox-like shell ([frustule](https://www.britannica.com/science/frustule)) composed of overlapping halves (epitheca and hypotheca) perforated by intricate and delicate patterns. Food is stored as [oil](https://www.britannica.com/science/lipid) droplets, and the golden-brown pigment fucoxanthin masks the [chlorophyll](https://www.britannica.com/science/chlorophyll) and [carotenoid](https://www.britannica.com/science/carotenoid) pigments that are also present. Diatoms are commonly divided into two orders on the basis of [symmetry](https://www.britannica.com/topic/symmetry-definition) and shape: the round nonmotile Centrales have radial markings; the elongated Pennales, which move with a gliding motion, have pinnate (featherlike) markings.

1. How this unicellular alga does described in question 3 carry out its reproduction?

[Reproduction](https://www.britannica.com/science/reproduction-biology) is usually by [cell division](https://www.britannica.com/science/mitosis), the overlapping shell halves separate, and each secretes a (usually) smaller bottom half. Thus, individual diatoms formed from successive bottom halves show a progressive decrease in size with each division. In a few months there can be as much as a 60 percent decrease in average size. Periodic [spore](https://www.britannica.com/science/spore-biology) [formation](https://www.britannica.com/science/biome) serves to restore the diatom line to its original size.

1. Differentiate between the two types of colonial form of algae

|  |  |  |
| --- | --- | --- |
|  | **Volvox** | **Scenedesmus** |
| *Reproduction* | Asexual and sexual | Asexual |
| *Order* | Clamydomonadeles | Sphaeropleales |
| *Motility* | Motile | Non,motile |
| *Habitat* | Ponds and ditches | Fresh and Brackish water |
| *Shape/Form* | Definite shape with number of cells | Consists of cells arranged in rows |

1. Volvox

Volvox is a polyphyletic genus in the volvocine green algae clade. Each mature *Volvox* [colony](https://en.wikipedia.org/wiki/Colony_(biology)) is composed of up to thousands of cells from two differentiated cell types: numerous [flagellate](https://en.wikipedia.org/wiki/Flagellate) [somatic cells](https://en.wikipedia.org/wiki/Somatic_(biology)) and a smaller number of [germ cells](https://en.wikipedia.org/wiki/Germ_cell) lacking in soma that are embedded in the surface of a hollow sphere or [coenobium](https://en.wikipedia.org/wiki/Coenobium_(morphology)) containing an [extracellular matrix](https://en.wikipedia.org/wiki/Extracellular_matrix) made of [glycoproteins](https://en.wikipedia.org/wiki/Glycoprotein).

### Adult [somatic](https://en.wikipedia.org/wiki/Somatic_cell) cells comprise a single layer with the flagella facing outward. The cells swim in a coordinated fashion, with distinct anterior and posterior poles. The cells have anterior [eyespots](https://en.wikipedia.org/wiki/Eyespot_apparatus) that enable the colony to swim towards light. The cells of colonies in the more basal Euvolvox clade are interconnected by thin strands of [cytoplasm](https://en.wikipedia.org/wiki/Cytoplasm), called protoplasmates. Cell number is specified during development and is dependent on the number of rounds of division.

*Volvox* can reproduce both sexually and asexually. The switch from asexual to sexual reproduction can be triggered by environmental conditionsand by the production of a sex-inducing pheromone. Desiccation-resistant diploid [zygotes](https://en.wikipedia.org/wiki/Zygote) are produced following successful fertilization. An [asexual](https://en.wikipedia.org/wiki/Asexual_reproduction) colony includes both somatic (vegetative) cells, which do not reproduce, and large, non-motile *gonidia* in the interior, which produce new colonies through repeated division. In [sexual reproduction](https://en.wikipedia.org/wiki/Sexual_reproduction) two types of [gametes](https://en.wikipedia.org/wiki/Gamete) are produced. *Volvox* species can be [monoecious](https://en.wikipedia.org/wiki/Monoecious) or [dioecious](https://en.wikipedia.org/wiki/Dioecious). [Male](https://en.wikipedia.org/wiki/Male) colonies release numerous sperm packets, while in female colonies single cells enlarge to become oogametes, or eggs. It has been suggested that switching to the sexual pathway is the key to surviving environmental stresses that include heat and [drought](https://en.wikipedia.org/wiki/Drought). Consistent with this idea, the induction of sex involves a [signal transduction](https://en.wikipedia.org/wiki/Signal_transduction) pathway that is also induced in *Volvox* by wounding.

Colony inversion is a special characteristic during development in the order Volvocaceae that results in new colonies having their [flagella](https://en.wikipedia.org/wiki/Flagella) facing outwards. During this process the asexual reproductive cells first undergo successive cell divisions to form a concave-to-cup-shaped embryo or plakea composed of a single cell layer. Immediately after, the cell layer is inside out compared with the adult configuration—the apical ends of the embryo protoplasts from which flagella are formed, are oriented toward the interior of the plakea. Then the embryo undergoes inversion, during which the cell layer inverts to form a spheroidal daughter colony with the apical ends and flagella of daughter protoplasts positioned outside. This process enables appropriate locomotion of spheroidal colonies of the Volvocaceae. The mechanism of inversion has been investigated extensively at the cellular and molecular levels using the model species.