NAME: YAYOCK IRENE YANAT

MATRIC NO: 19/MHS01/440

DEPARTMENT: MEDICINE AND SURGERY

BIO 102 ASSIGNMENT.

1. Eichler’s grouping of 1983.

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|  DIVISION |  CLASS |
|  Thallophyta |  Phycotinae (Algae) Mycotinae (Fungi) |
|  Bryophyta |  Hepaticae (Liverworts) Musci (Mosses) |
|  Pteridophyta |  Psilotinate (Psilotum) Lycopodinae (Lycopodium, Selaginella) Equisetinae (Horsetails) Filicinae (Ferns) |
|  Spermatophyta |  Gymnospermae (Gymnosperms) Angiospermae (Angiosperms) |

1. Algae are highly nutritious, they have high protein contents and high concentration of minerals, trace elements and minerals and provide food for man, they also contain iodine content therefore prevent goitre.

Algae is also used for their purported powers to cure or prevent illnesses e.g. cough, goitre, hypertension and diarrhoea

Brown algae yield alginic acid which yields which is used to stabilize emulsions and suspensions found in products like syrups, ice cream, and paint

Bacteria, fungi and cell cultures are commonly grown on agar gels. Agar is also used in the food industry to stabilize pie fillings and preserve canned meat and fish.

1. Chlamydomonas is a unicellular and motile form of algae and are found in stagnant water, and on damp soil, in fresh water and seawater. It is spherical or slightly cylindrical, a papilla may be present or absent. Chloroplasts green and usually cup shaped. A key feature of the genus is its two anterior flagella used for sensing and swimming, each as long as the other. It contains ion channels (channelrrhodopsins) that are directly activated by light. The nucleus is typically located in the center and with a distinct nucleolus. There is an eyespot and one or several contracticle vacuoles. One or several pyrenoids are located within the chloroplast and starch bodies around the pyrenoid. The mitochondria appears elongated, is bound by a double membrane and has distinct cristae protruding into the dark matrix.
2. In chlamydomonas reproduction can either be asexual or sexual.

**Asexual reproduction**: it results in the production of daughter cells in which the amount and quanlity of genetic material in the nucleus of the mother cell is maintained in the daughter cells. Reproduction occurs by zoospores, aplanospores, hypnospores or by a pamella stage.

In chlamydomonas, a cell about to divide loses its flagella. The cell undergoes mitotic division leading to two nuclei, cell walls are elaborated with delimit cytoplasm around each nucleus i.e two daughter cells (zoospores) are released. Increase in population is by repeated mitotic divisions.

**Sexual reproduction**: it takes place under unfavourable conditions like lack of moisture or nutrients. Instead of forming into spore, the haploid daughter cells form gametes that have different mating strains, opposite mating strains fuse in a process called isogamy to form a diploid zygote which contains two set of chromosomes. After a period of dormancy the cell undergoes meiosis, a type of cell division that reduces the genetic content by half. The division produces four genetically unique haploid cells that eventually grow into mature cells. In Chlamydomonas, aggregation of cells (clumping) in a colony occurs under favourable conditions, these cells pair by posterior (flagellated) ends. This paring is said to be isogamous because the pairing cells are morphologically identical. The cytoplasm fuse and flagella are lost, the two nuclei, this is essentially fertilization process so the zygote can be formed. The zygote undergoes two successive cell divisions, the first restores the haploid condition by halving nuclear material in the two resulting nuclei (reduction division) while in the second division each haploid nucleus undergoes normal mitotic division. These two divisions end up with four cells and with n quantity of nuclear material are together known as meiosis. The four products of meiosis are released as haploid zoospores.

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|  **Pandorina**  |  **Volvox** |
| Cells make a hollow sphere of 16 or 32 cells embedded in gelatinous matrix | Forms large hollow of 500 to 6000 cells |
| Sexual reproduction is achieved by anisogamous pairing | Sexual reproduction is oogamous |
| Not as advanced as Volvox | More advanced than Pandorina as cells show greater levels of differentiation and specialisation. |
|  All cells form colonies | Not all cells form colonies |

1. Fucus is a complex form of algae, also called rockweed, commonly on rocky seacoasts and in salt marshes of northern temperate regions. The thallus is perennial with an irregular or disc-shaped holdfast or with haptera. The erect portion of the thallus is dichotomous or supinnately branched, flattened and with a distinct midrib. Gas-filled pneumatocysts (air vesicle) are present in pairs in some species, one on either side of the midrib. The erect portion of the thallus bears cryptostomata and caecostomata (sterile surface cavities). The base of the thallus is stipe-like due to abrasion of the tissue lateral to the midrib and it is attached to the rock by a holdfast. The gametangia develop in conceptacles embedded in receptacles in the apicles of the final branches. The growth of the thallus is localized at the tips of forked shoots, and most species are between about 2 and 50 cm in length.They may be monoecious or dioecious; some species produce eggs and sperm all year long.