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Course: BIO 102
Dept: MBBS
M/N: 19/mhs 01/122

1) Classify plants according to Eichlers group of 1883.
2) How are algae of importance to man.
3) Describe a unicellular form of algae. 4) How does this unicellular algae in question 3 reproduce.
5) Differentiate between two types of colonial algae form.
6) Describe a named complex form of algae.

Solution

The Plants Kingdom, "Eichler"

	DIVISION	CLASS
a)	Thallophyta	Phycotinae (Algae) Mycotinae (Fungi)
b)	Bryophyta	Hepaticae (Liverwort) Masses (Musci)
c)	Pteridophyta	Psilotinae (Psilotum) Lycopodinae (Lycopodium, Selaginella) Equisetinae (Horsetails)
d	Spermatophyta	Filicinae (Ferns) Gymnospermae (Gymnosperms) Angiospermae (Angiosperms)

2) IMPORTANCE OF ALGAE.

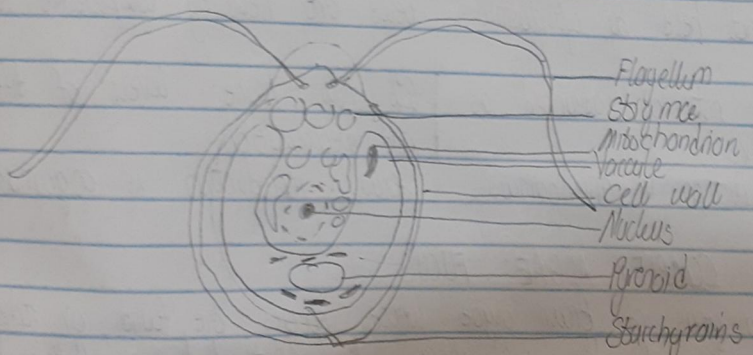
i) They can serve as food to man because they are highly nutritious and are high in proteins, mineral salts. They are especially high in iodine which prevents goitre.

ii) Brown algae yield Alginic acid which is used in ice creams, syrup, shampoo. They can be thickening agents. They also provide agar used for preparation of various gels in scientific research. Carrageenan are used as thickening

and stabilising agents.
Seaweeds are source of three chemical extracts used in the pharmaceutical, textile and cosmetic industries.
They have also been used as drugs to cure, prevent illnesses. Diatom algae have been used in forensic medicine (when present in the lungs) shows that a person died from drowning.

Chlamydomonas

It is found in stagnant water. It is a unicellular form of algae. It is usually cup-shaped chloroplast and circular in shape. It has flagella for locomotion, a stigma (eye spot) for photosensitivity (light). It has a pyrenoid for storing manufactured sugar that is processed into starch. It has a nucleus for controlling cellular activities. It also contains mitochondrion (mitochondria) for energy production.



A Chlamydomonas

Reproduction of Chlamydomonas

It has two types of reproduction i) vegetative ii) Sexual reproduction
Vegetative: Here the amount and quality of genetic material in the nucleus of the mother cell is maintained in the daughter cell. It undergoes mitotic division, this leads to the increase in the number of cells in unicellular organisms and size increase in multicellular organisms. A cell about to divide loses its flagella. It undergoes mitotic division leading to two nuclei, to divide loses its flagella. It undergoes mitotic division leading to two nuclei, cell walls are elaborated which delimit cytoplasm around each nucleus.

Alex B. Briggs
19/mhs01/122

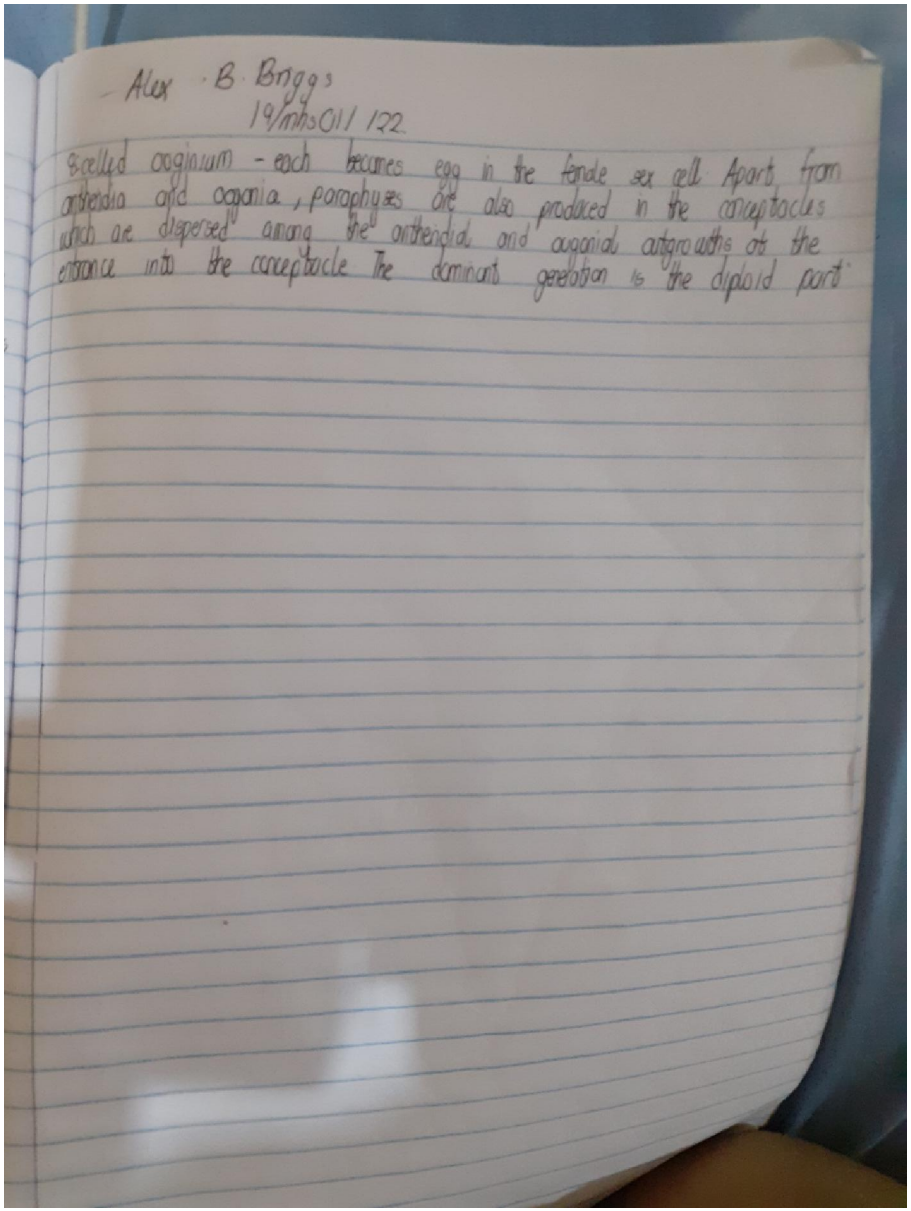
ie two zoospores are released Increase in population of cells in a colony is due to mitotic divisions repeatedly.

b) Sexual reproduction: Here instead of forming spores, the haploid daughter cells form gametes that have two different mating strains which are structurally similar and are positive and negative. Opposite mating strains fuse by a process called isogamy to form diploid zygote. After a period of dormancy, the zygote undergoes meiosis, this reduces the genetic content by half and produce four unique (genetically) haploid cells that grow into mature cells. It involves plasmogamy and karyogamy.

5)	PANDORINA	VOLVOX
i)	It consists of 16 cells	Numerous cells up to a thousand
ii)	All cells can form colonies	Only cells at the posterior end can form colonies (gonidia)
iii)	Cells are not held by cytoplasmic strands	Cells are held by cytoplasmic strands
iv)	Cells are not as advanced as in volvox.	Cell show higher levels of differentiation and specialization
v)	Sexual reproduction is anisogamous	Sexual reproduction is oogamous

6) COMPLEX ALGAE: FUCUS

They are a genus of Brown algae whose species are found on rocks in intertidal zones of the sea shores. The plant body is flattened, dichotomously-branched thallus with mid-rib, and a multi-cellular disc which attaches the plant to a surface. It has air bladders which is believed to aid to plant to float on water. Various fucus exist; vary in size from a few centimetres to 2 metres in length. They also vary in terms of whether sex cells are found in the same / different chambers on plant bodies. Sexual reproduction is oogamous, sex cells are produced in conceptacles which have openings on the thallus surface. The male conceptacles undergoes meiosis, which undergoes (produce) mitotic divisions to produce 64 antheridium cells which develops into biflagellate sperm that swims out through the ostiole. Female conceptacle produces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8-celled oogonium - each becomes egg in the female sex cell. Apart from
antheridia and oogonia, paraphyses are also produced in the conceptacles
which are dispersed among the antheridia and oogonial outgrowths at the
entrance into the conceptacle. The dominant generation is the diploid part