19/MHS01/421

Name: Umar Abdullahi Dabarako
Matric number: 19/MHS01/421
Department: MBBS
BIO 102 Assignment

1) Eichler's grouping of 1883

DIVISION	CLASS
Thallophyta	Phycotinae (Algae) Mycotinae (fungi)
Bryophta	Hepaticae (Liverworts) Musci (Mosses)
Pteridophyta	Psilotinate (Psilotum) Lycopodinae (Lycopodium, selaginella) Equisetinae (Horsetails) Filicinae (Ferns)
Spermatophyta	Gymnospermae (Gymnosperms) Angiospermae (Angiosperms)

2) Importance of algae to man

Certain species are harvested for food and cosmetics in the far East. Algae serves as a thickening agent in ice cream and shampoo. It also serves as drug. Algae have high Iodine content which prevents goitre. Agar is used for the preparation of various gels used in scientific research. Carrageenan is also used as a stabilizing agent in products such as puddings, syrups, etc. Diatoms are also widely used in forensic medicine. Indicators of environmental problems in aquatic ecosystems.

3 Unicellular form in the algae

Chlamydomonas represents the unicellular form of green algae. It is a lentic algae. It uses flagella for its mobility. The cell is bounded by a cellulose cell wall; contains organelles such as nucleus, stigma, pyrenoid, mitochondria, etc. The nucleus carries the genetic material. The eyespot is for photoreception. Pyrenoid processes manufactured sugar to starch.

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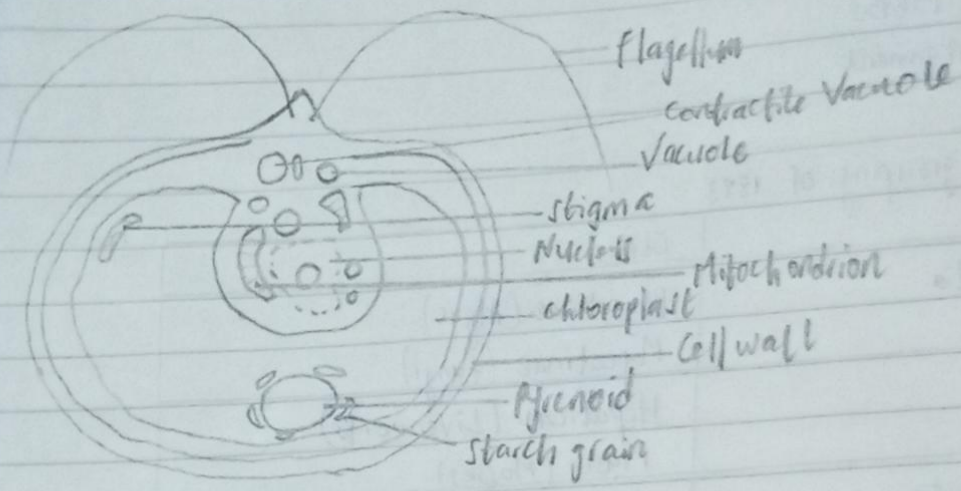

THE STRUCTURE OF CHLAMYDOMONAS.

4 Reproduction in Chlamydomonas

Reproduction ~~of~~ in Chlamydomonas is of two types: asexual and sexual

i asexual reproduction/vegetative reproduction 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. Therefore, it undergoes mitotic cell division.

ii Sexual reproduction: When the haploid daughter cells are triggered by certain environmental conditions, they undergo sexual reproduction. The haploid daughter cells form gametes which fuse (isogamy) to form a diploid zygote. The zygote then undergoes meiosis to produce four genetically unique haploid cells. The flagella are lost after plasmogamy (fusion of cytoplasm of gametes). Then karyogamy occurs. The four products of meiosis are released as haploid zoospores.

5

Pandorina	Volvox
The colony consists of 16 cells.	Numbers of cells may run into thousands
All cells later form colonies	Not all cells form new colonies
Sexual reproduction is anisogamous i.e pairing by flagella ends	Sexual reproduction is oogamous i.e male gamete is motile while the egg is not motile
The cells do not show a high level of differentiation and specialisation	The cells show a more advanced level of differentiation and specialisation

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6 A more complex form of ALGAE : FUCUS

Fucus

Fucus is a genus of brown algae whose species are often found on rocks in the intertidal zones of the sea shores. The plant body is flattened, dichotomously-branched thallus with a mid rib, a vegetative apex and a multicellular disk with which plant is attached to rock surface. It has air bladders which aid buoyancy. Sexual reproduction is oogamous. In the male conceptacles, one of the diploid cells undergo meiosis. The meiotic product undergo 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, an 8 celled oogonium is ~~bo~~ produced, each becomes an egg. Motile sperm cell move through the ~~ostium~~ ostiole into the female conceptacle where eggs are fertilised and diploid zygote are produced. This germinates into a new diploid fucus plant.