AJAYI BUKOLA PRECIOUS **NURSING**

19/MHS02/012 **BIO 102 ASS**

1. CLASSIFICATION OF PLANTS ACCORDING TO EICHLER'S GROUPING OF 1883

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

2. ECONOMIC IMPORTANCE OF ALGAE TO MAN

Algae are important as food for fish. Certain species are harvested for food and cosmetics in the Far East. It serves as food foe livestock and people, thickening agents in ice cream and shampoo, drugs to ward of disease. Algae have high iodine content therefore prevent goitre. Seaweeds are source of three chemical extracts used extensively in the food, pharmaceutical, textile and cosmetic industries. Brown algae yield Alginic acid which is used to stabilize emulsions and suspensions; found in products like syrup, ice cream and paint. Different species of red algae provide agar and carrageen used for the preparation of various gels used in scientific research. Bacteria, fungi and cell cultures are commonly grown on agar gels. Agar is used in the food industry to stabilize pie fillings and preserve canned meat and fish. Carrageen is also used as a thickening agent in products e.g. puddings, syrups and shampoos. Algae have been surveyed for anticancer compounds, with several cyanobacteria appearing to contain promising candidates. They have also been used for centuries, especially in Asian countries for their supported powers to cure or prevent illnesses e.g. cough, gout, gallstones etc.

3. UNICELLULAR FORM IN ALGAE (CHLAMYDOMONAS)

- Chlamydomonas represents the unicellular and motile forms of green algae.
- It is found in stagnant water usually along with other forms.
- Flagella are the structures for mobility.
- The cell is bounded by a cellulose cell wall; contains organelles e.g. nucleus, mitochondria, stigma (eye spot), cup-shaped chloroplast, pyrenoid etc.
- The nucleus carries the genetic programme of the cell while the stigma is for photoreception.
- Mitochondria mediate the elaboration of energy molecules.
- Manufactured sugar is processed into starch on the pyrenoid.

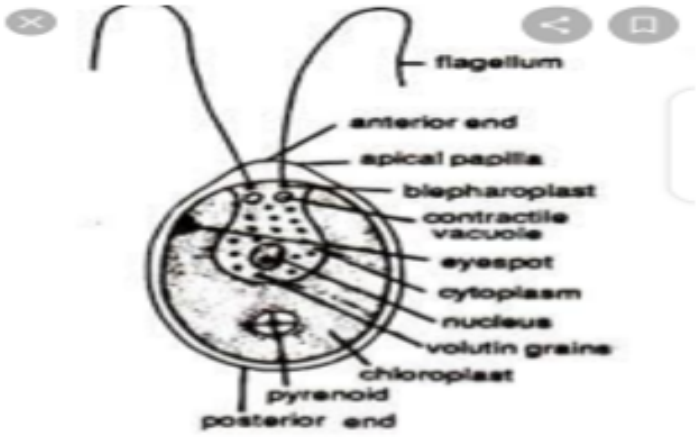

Fig. 11. *Chlamydomonas. A vegetative cell.*

4. REPRODUCTION

In Chlamydomonas, reproduction can either be vegetative or sexual.

VEGETATIVE REPRODUCTION: this 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. Thus, if the amount of genetic material in the mother cell nucleus is n, the daughter cells also have n quality of genetic material.

The kind of cell division which maintains the quantity and quality of genetic material is called mitotic divisions. 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 undergoes mitotic division leading to two nuclei, cell walls are elaborated which delimit cytoplasm around each nucleus i.e. two daughter cells (zoospores) are released. Increase in the population of cells in a colony is achieved by repeated mitotic divisions.

SEXUAL REPRODUCTION: certain environmental conditions e.g. lack of nutrients or moisture may trigger the haploid daughter cells to undergo sexual reproduction. Instead of forming into spores, the haploid daughter cells form gametes that have two different mating strains which are structurally similar and are positive and negative strains. Opposite mating strains fuse in a process called **isogamy** to form a diploid zygote, which contains two sets of chromosomes. After a period of dormancy, the zygote undergoes meiosis, a type of cell division that reduces the genetic content of a cell by half. This cell division (i.e. meiosis) produces four genetically unique haploid cells that eventually grow into mature cells.

Sexual reproduction involves union of sex cells (gametes). In Chlamydomonas, aggregation of cells (clumping) in a colony occurs under favorable conditions. These cells pair by their posterior (flagellated) ends. This pairing is said to be isogamous because the pairing cells (gamete) are morphologically identical. The cytoplasm of the pairing cells fuse (plasogamy) and the flagella are lost. The two nuclei fuse (karyogamy), this situation is essentially a fertilization process so that a zygote is formed. In other word, two cells each with n quantity of genetic (nuclear) material (i.e. haploid nuclear material) undergo karyogamy (fusion of nuclei) to produce a single cell with 2n (diploid) nuclear material. The zygote secretes a thick cell wall called a zygospore and may remain dormant in that state for sometimes.

After karyogamy sometimes, the zygote undergoes two successive cell divisions the first division restores the haploid condition by halving the nuclear material in the two resulting nuclei (reduction division) while in the second division each haploid nucleus undergoes a normal mitotic division. These two divisions which 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.

5. DIFFERENCES BETWEEN PANDORINA AND VOLVOX

PANDORINA	VOLVOX
Complex algae	More complex than pandorina
Consists of 16 cells attached to one another.	More cells are in the colony; number may run into thousands and connected with cytoplasmic strands that run through the cells.
All cells form new colonies.	Not all cells form new colonies; but the larger cells at the posterior ends divide to form new colonies.

6. COMPLEX FORM OF ALGAE (FUCUS)

- 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, a reproductive apex at maturity and a multicellular disc with which plant is attached to rock surface.
- They 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 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, similar to the situation in the male conceptacle, leads to the production of an 8 called 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 antheridal 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.