A. W. EICHLER'S SYSTEM OF CLASSIFICATION

PLANT KINGDOM

SUBKINGDOM -1 CRYPTOGAMAE (FLOWERLESS PLANTS)

- DIVISION 1- THALLOPHYTA
  - CLASS 1- ALGAE
  - CLASS 2 -FUNGI
- DIVISION 2- BRYOPHYTA
- DIVISION 3- PTERIDOPHYTA

SUBKINGDOM -2 PHANEROGAMAE (FLOWERING PLANTS)

- DIVISION 1- GYMNOSPERMAE
- DIVISION 2- ANGIOSPERMAE
  - CLASS 1- MONOCOTYLEAE
  - CLASS 2- DICOTYLEAE

ALGAE- ARE EUKARYOTIC EXCEPT CYANOPHYCEAE

CHLOROPHYLL CONTAINING THALLOID PLANTS

COME UNDER CRYPTOGAMAE AND DIVISION THALLOPHYTA

CRYPTOGAMES

- THESE ARE PLANTS WITH INCONSPICUOUS REPRODUCTIVE STRUCTURES
- CRYPTOS- MEANS HIDDEN
- GAMOS- MEANS REPRODUCTON

ALGAE- DISTINGUISHING FEATURES

- CHLOROPHYLL CONTAINING AUTOTROPHIC THALLOID PLANTS
- PLANT BODY IS A THALLUS
- THALLUS- SIMPLE PLANT BODY NOT DIFFERENTIATED INTO ROOT, STEM AND LEAVES
- SEX ORGANS ARE UNICELLULAR

ALGAE- DISTINGUISHING FEATURES

- OCCURS IN MANY HABITATS BUT MAJORITY ARE AQUATIC
- PLANT BODY NOT DIFFERENTIATED INTO TISSUE SYSTEMS
- SEX ORGANS MOSTLY UNICELLULAR
- AFTER GAMETIC UNION NO EMBRYO IS FORMED

ALGAE- THALLUS VARIATION

- 5 GROUPS OF ALGAE BASED ON THALLUS STRUCTURE

1. UNICELLULAR
2. COLONIAL
3. FILAMENTOUS
4. SIPHONACEOUS
5. PARENCHYMATOUS

- **UNICELLULAR**

➢ **NO CELLULAR DIFFERENTIATION**

➢ **4 SUBGROUPS ARE PRESENT**

1. **RHIZOPODIAL UNICELLS**

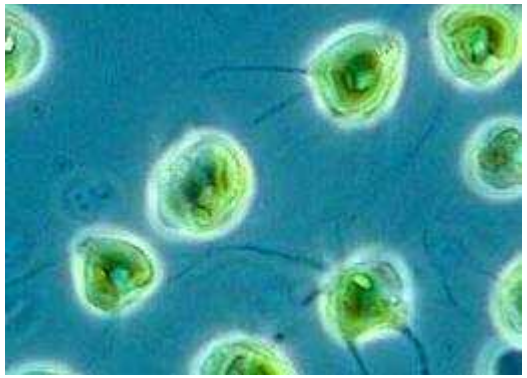
2. **FLAGELLATED UNICELLS**

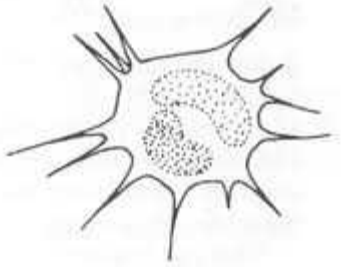
3. **SPIRAL FILAMENTOUS UNICELLS**

4. **NON MOTILE UNICELLS**

RHIZOPODIAL UNICELLS

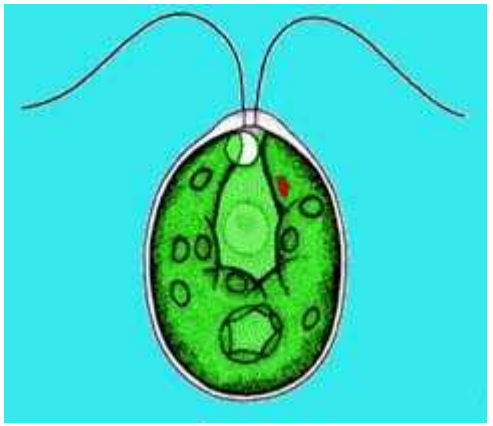
- LACK A RIGID CELL WALL.
- HAVE CYTOPLASMIC PROJECTIONS FOR AMOEBOID MOVEMENT
- Eg. CHRYSAMOEBA





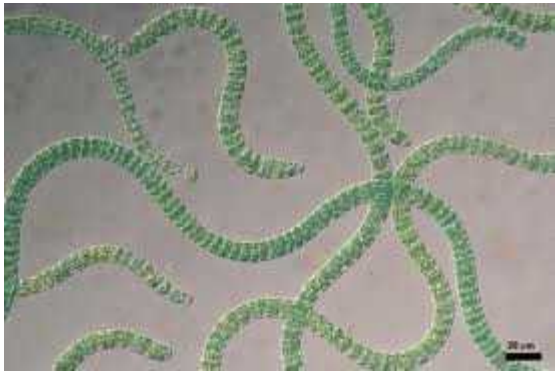
FLAGELLATED UNICELLS

- BODY IS COMPOSED OF FLAGELLATED VEGETATIVE CELLS
- NUMBER OF FLAGELLA MAY BE ONE OR MORE
- Eg. CHLAMYDOMONAS



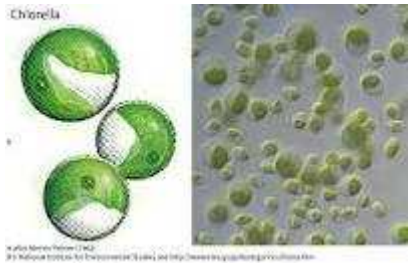
SPIRAL FILAMENTOUS UNICELLS

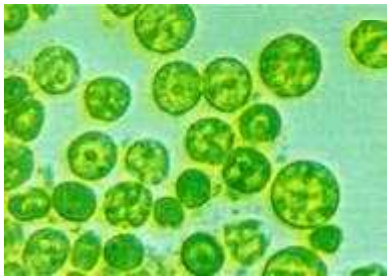
- **THESE FORM SPIRAL OR COILED STRUCTURES**
- **Eg. SPIRULINA**



NON MOTILE UNICELLS

- **NON MOTILE COCCOID ALGAE WITHOUT FLAGELLA**
- **Eg. CHLORELLA**





COLONIAL FORMS

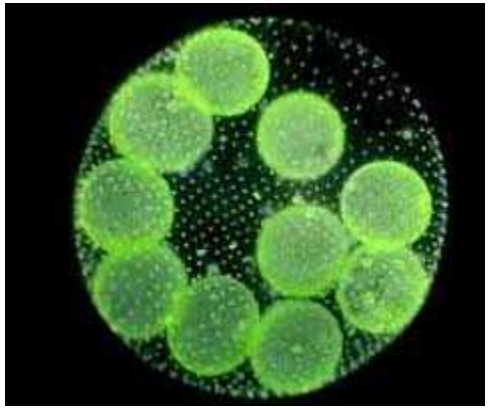
- PRODUCED BY THE AGGREGATION OF ALL THE DIVIDED CELLS IN A COMMON MUSILAGINOUS MASS
- SO ALL MEMBERS OF THE COLONY HAVE SIMILAR STRUCTURE

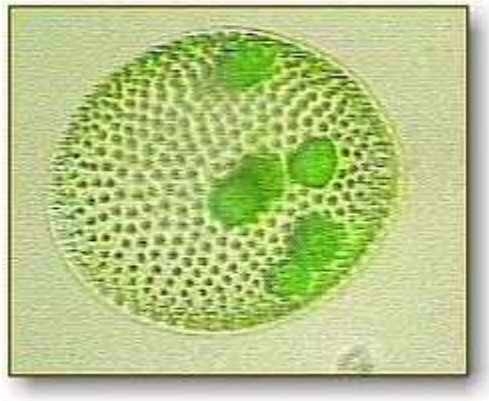
- 2 TYPES OF COLONIAL FORMS ARE PRESENT

1. COENOBIAL
2. PALMELLOID

COENOBIAL

- COENOBIUM IS A COLONY WITH DEFINITE SHAPE, SIZE AND ARRANGEMENT OF CELLS
- MAY BE MOTILE (FLAGELLATED)-Eg. VOLVOX
- OR
- NON MOTILE (NON-FLAGELLATED) Eg. HYDRODICTYON





PALMELLOID

- IN PALMELLOID COLONY THE NUMBER OF CELLS, THEIR SHAPE AND SIZE ARE NOT DEFINITE
- CELLS ARE IRREGULARLY AGGREGATED IN A COMMON MUCILAGINOUS MASS
- Eg. TETRASPORA

FILAMENTOUS FORMS

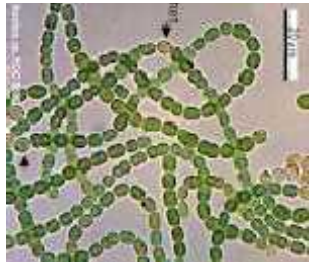
- FORMED BY REPEATED TRANSVERSE DIVISIONS OF THE CELLS
- DAUGHTER CELLS DO NOT SEPARATE.
- THEY REMAIN ATTACHED END TO END
- FILAMENTS MAY BE BRANCHED OR UNBRANCHED

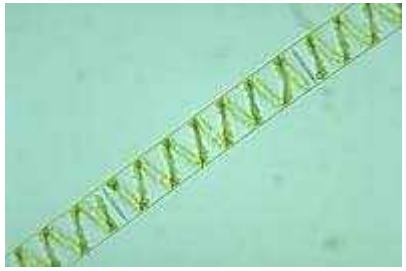
CELLS OF THE FILAMENT MAY BE IN ONE ROW(UNIAXIAL) OR MORE THAN ONE ROW (MULTIAXIAL)

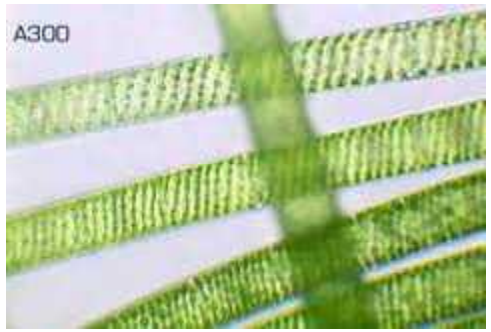
❑ UNBRANCHED FILAMENTS

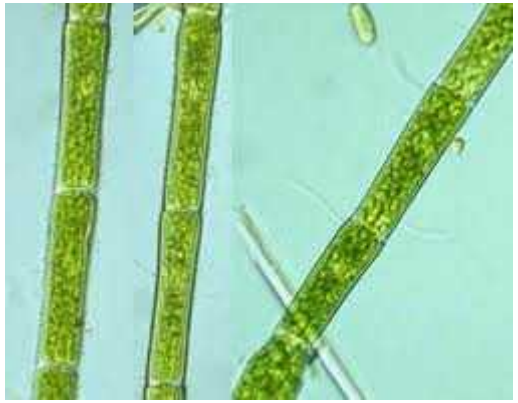
- SIMPLE UNBRANCHED FILAMENTS ARE SEEN IN A FEW ALGAE
- FILAMENTS MAY BE FREE FLOATING (*SPIROGYRA*) OR ATTACHED TO SOME SUBSTRATUM

  (*OEDOGONIUM, ULOTHRIX)*
- FILAMENTS ALSO MAY FORM COLONY (*NOSTOC*)









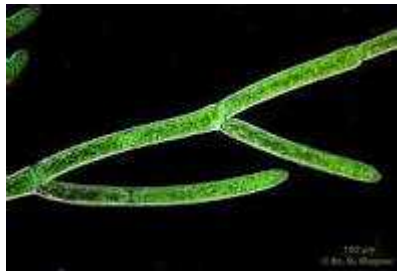
BRANCHED FILAMENTS

- BRANCHED FILAMENTS ARE FORMED BY REPEATED DIVISIONS OF LATERAL OUTGROWTH OF THE CELLS
- 3 TYPES ARE PRESENT

1. SIMPLE FILAMENTS
2. HETEROTRICHOUS
3. PSEUDOPARENCHYMA TOUS

SIMPLE FILAMENTS

- THEY REMAIN ATTACHED TO SUBSTRATUM BY A BASLA CELL
- BRANCHES ARISE FROM ANY CELL EXCEPT BASAL CELL
- Eg. CLADOPHORA

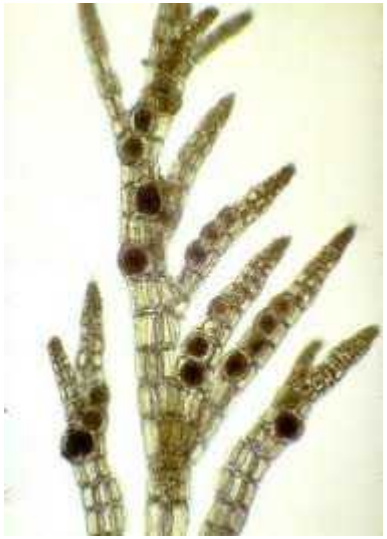


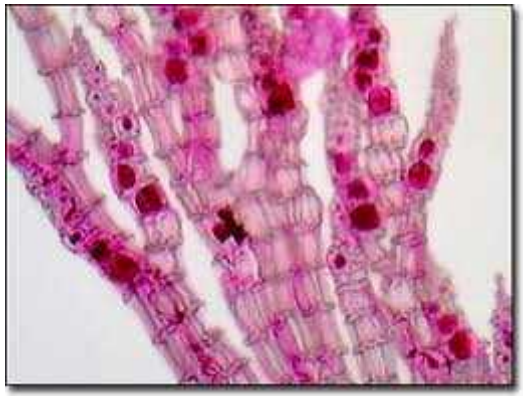
HETEROTRICHOUS

- VERY ADVANCED TYPE OF THALLUS
- HAS AN ERECT SYSTEM AND PROSTRATE SYSTEM
- Eg. ECTOCARPOUS

PSEUDOPARENCHYMATOUS

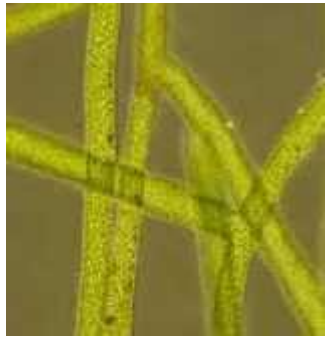
- AXIAL FILAMENTS AND THEIR BRANCHES FORM A PARENCHYMATOUS STRUCTURE
- Eg. BATRACHOSPERMUM, POLYSIPHONIA





SIPHONACEOUS FORMS

- THALLUS IS MADE UP OF BRANCHED, ASEPTATE, COENOCYTIC TUBULAR FILAMENTS
- Eg. VAUCHERIA



PARENCHYMATOUS FORMS

- THE THALLUS IS FLAT , FOLIAR OR TUBULAR
- Eg. ULVA- THALLUS FLAT
- COMPLEX THALLUS - SARGASSUM

ALGAL PIGMENTS

- ALGAL CELLS HAVE CHARACTERISTIC COLOUR AS THEY CONTAIN A COMBINATION OF PIGMENTS
- PIGMENTS ARE PRESENT IN PLASTIDS EXCEPT BGA
- IN BGA PIGMENTS ARE PRESENT IN THE PERIPHERAL CYTOPLASM CALLED CHROMOPLASM

CHROMOPLASTS

- COLOURED PLASTIDS
- PLASTIDS WITH BOTH CHLOROPHYLL *a* AND CHLOROPHYLL *b* ARE CALLED CHLOROPLAST
- PLASTIDS WITHOUT CHLOROPHYLL *b* ARE CHROMATOPHORES

- 4 TYPES OF PIGMENTS ARE PRESENT IN ALGAE

1. CHLOROPHYLL
2. XANTHOPHYLL
3. CAROTENES
4. PHYCOBILINS

CHLOROPHYLL

- **5 TYPES ARE PRESENT**

1. **CHLOROPHYLL *a, b, c, d* AND *e***
2. ***CHL-A IS PRESENT IN ALL ALGAL GROUPS***
3. ***Chl-b ONLY IN CHLOROPHYCEAE***
4. ***CHLO-C ONLY IN MARINE ALGAE-***
5. ***CHLO-d IN RED ALGAE AS A TRACE***
6. ***CHL0- e IN RED ALGAE***

XANTHOPHYLL

- MORE THAN 20 TYPES ARE PRESENT
- LUTEIN, VIOLAXANTHIN AND NEOXANTHIN OCCUR IN A FEW CHLOROPHYCEAE AND PHAEOPHYCEAE
- FUCOXANTHIN IS THE MAIN PIGMENT OF PHAEOPHYCEAE
- MYXOXANTHOPHYLL, MYXOXANTHIN AND OSCILLOXANTHIN ONLY IN BGA

CAROTENES

- α - CAROTENE OCCURS IN CHLOROPHYCEAE AND RHODOPHYCEAE
- β- CAROTENE IN ALL ALGAL GRTOUPS
- C- CAROTENE IN CHLOROPHYCEAE
- E- CAROTENE IN BACILLARIOPHYCEAE, PHAEOPHYCEAE AND CYANOPHYCEAE
- FLAVACENE IN A FEW MEMBERS OF CYANOPHYCEAE

PHYCOBILINS

- **PHYCOBILINS ARE 2 TYPES**

1. **RED PHYCOBILIN- PHYCOERYTHRIN- PRESENT ONLY IN RED ALGAE**

   (RHODOPHYCEAE)

1. **BLUE PHYCOBILIN- PHYCOCYANIN- PRESENT ONLY IN CYANOPHYCEAE**