

ALGAE

CLASS - XI



Dr. U.P. Pani
PGT (Biology)
JNV Durg (CG)

HABITAT

- ❖ Algae are autotrophic, diverse group of eukaryotic organisms, ranging from unicellular to multicellular forms.
- ❖ Aquatic (fresh water and marine) and terrestrial environment.
- ❖ They also occur in moist stones, soils, wood, on snow and on ice.



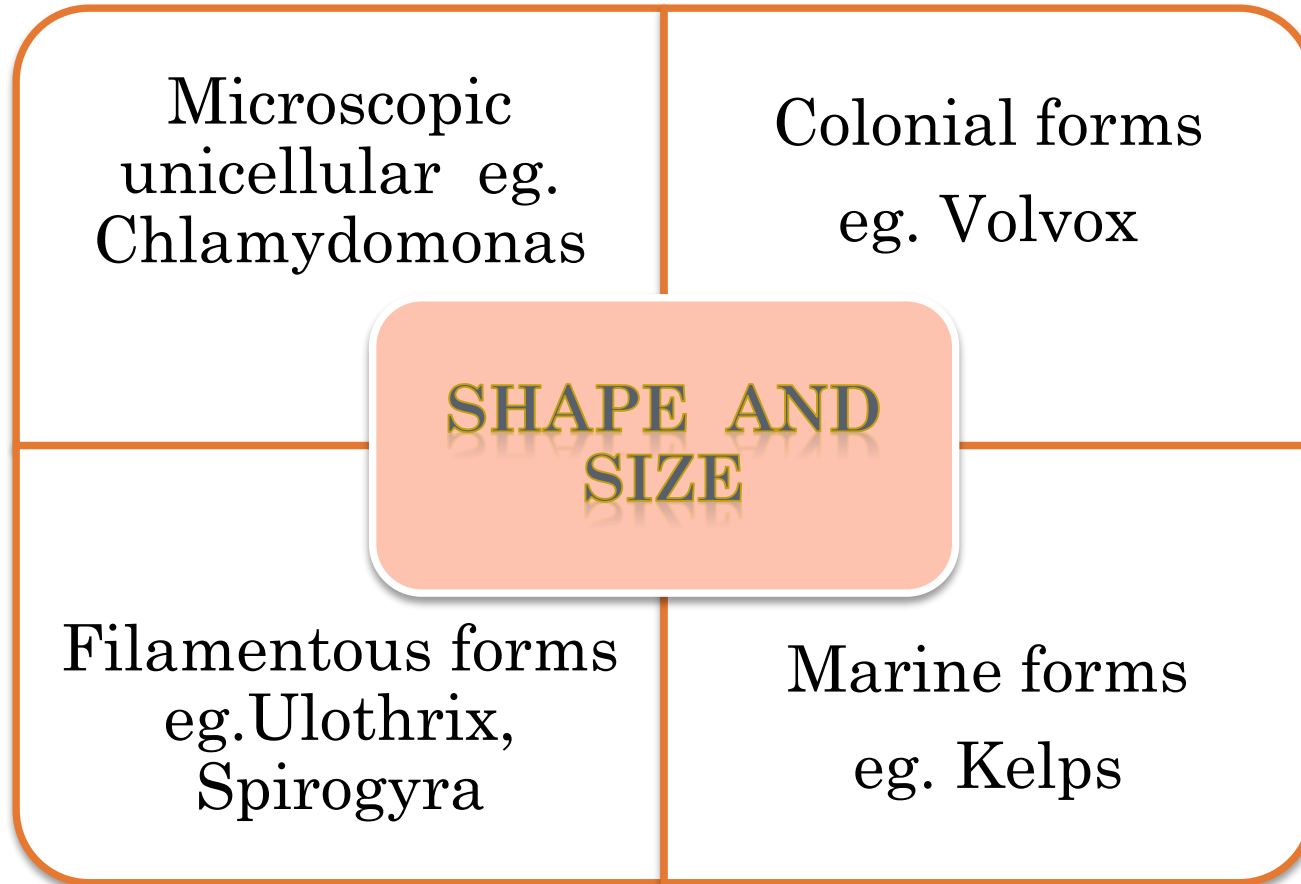
Marine Algae

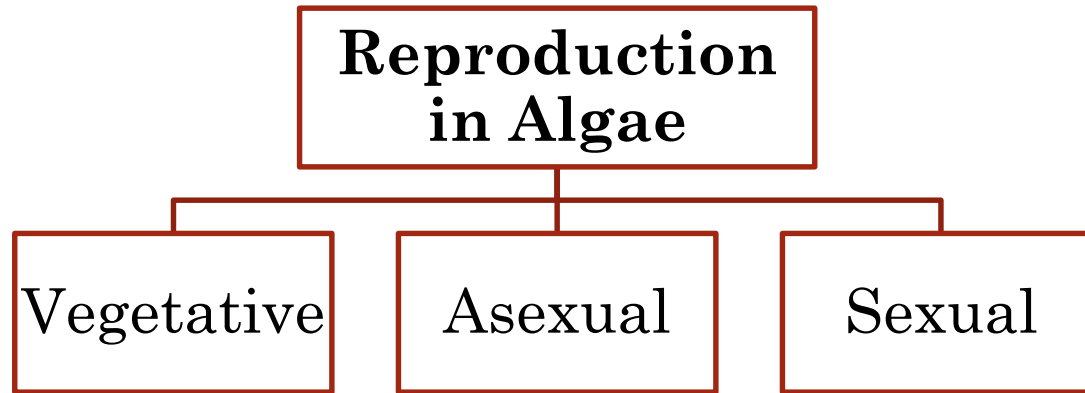


Algae on wood



SHAPE AND SIZE OF ALGAE





1. Vegetative reproduction is by fragmentation.
2. Asexual reproduction is by the production of different types of spores, the most common being the **zoospores**.
3. Sexual reproduction takes place through fusion of two gametes. Gametes may be isogamy or anisogamy or oogamy.



SEXUAL REPRODUCTION

- I. Isogamy - Fusion of two morphologically identical gametes. e.g. *Spirogyra*
- II. Anisogamy - Fusion of two dissimilar gametes, i.e., one gamete is smaller than the other. e.g. some species of *Chlamydomonas*
- III. Oogamy - Fusion between one large, non-motile female gamete and a smaller, motile male gamete. e.g. *Volvox*, *Fucus*



USEFULNESS OF ALGAE

Source of food

Used as biofertilizer

Sewage treatment

**Alternative to
chemical dyes and
colouring agents**

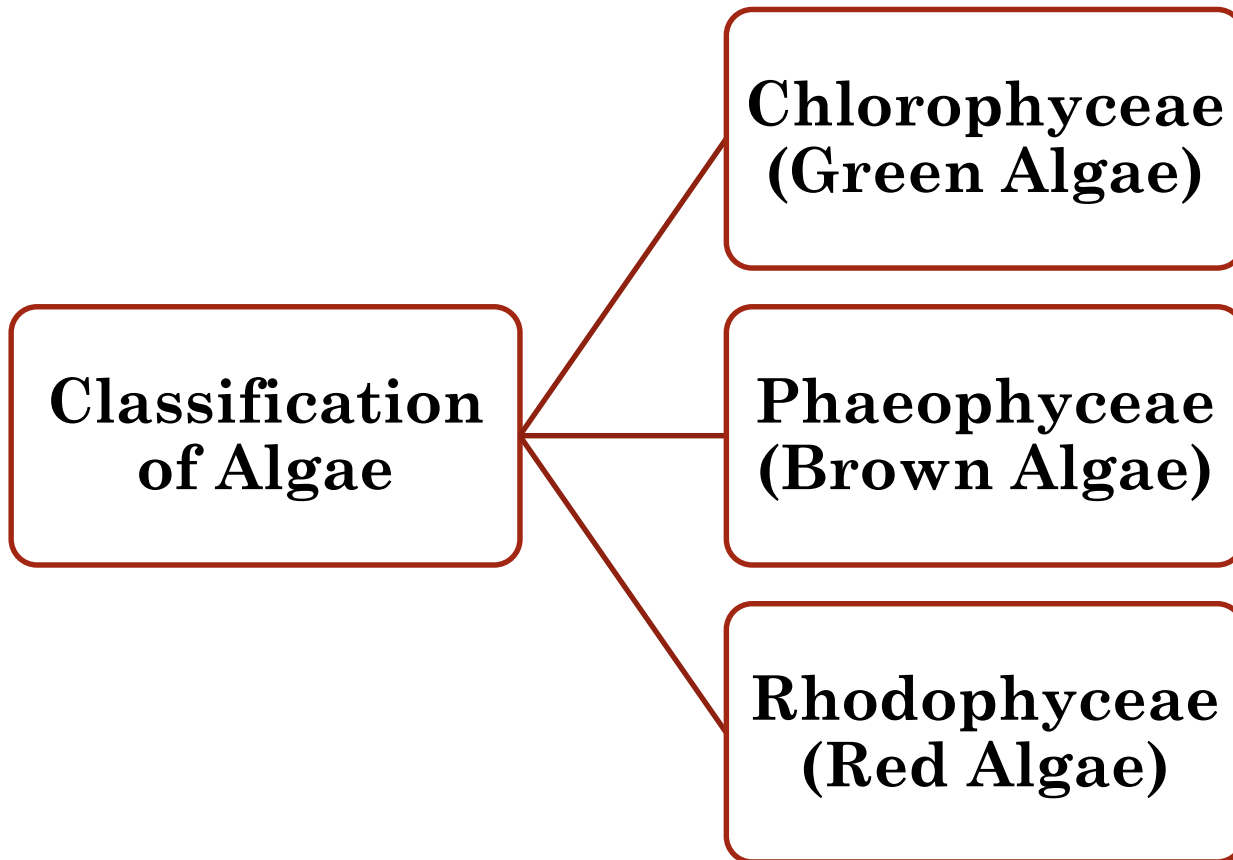
**Commercial uses
Agar**



ECONOMIC IMPORTANCE OF ALGAE

1. At least a half of the total carbon dioxide fixation on earth is carried out by algae through photosynthesis.
2. Major component in aquatic food chain as primary producers.
3. *Porphyra*, *Laminaria* and *Sargassum* are used as food.
4. **Algin** (brown algae) and **carrageen** (red algae) are used as hydrocolloids, which is a fibrous structure holds water and used to transport seedling.
5. Agar is used as commercial products.
6. Gelidium, Gracilaria are used to grow microbes, make ice creams and jellies.
7. Chlorella and Spirulina are rich in proteins and used as food supplements.





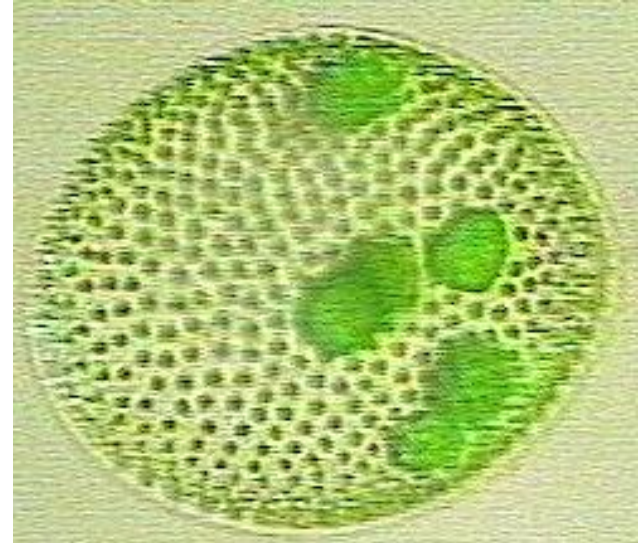
CHLOROPHYCEAE (GREEN ALGAE)

- ❖ Unicellular / colonial / filamentous
- ❖ Pigments - chlorophyll *a and b*
- ❖ chloroplasts may be discoid, plate-like, reticulate, cup-shaped, spiral or ribbon-shaped
- ❖ Store bodies – pyrenoids, oil droplets
- ❖ Rigid cell wall made of an inner layer of cellulose and an outer layer of pectose



CHLOROPHYCEAE (GREEN ALGAE)

- ❖ Vegetative reproduction by fragmentation
- ❖ Asexual reproduction by zoospores
- ❖ Sexual reproduction by isogamous / anisogamous / oogamous
- ❖ e.g. *Chlamydomonas*, *Volvox*, *Ulothrix*, *Spirogyra* and *Chara*



Volvox



PHAEOPHYCEAE (BROWN ALGAE)

- ❖ Marine habitats
- ❖ Vary in shape and size from simple branched, filamentous forms (*Ectocarpus*) to profusely branched forms kelps about 100 m height.
- ❖ Body consists of holdfast, a stalk, stipe and frond.
- ❖ Pigments - chlorophyll a, c, carotenoids, xanthophylls, fucoxanthin
- ❖ Food is stored as carbohydrates in the form of laminarin or mannitol.
- ❖ Cell wall covered by algin, a gelatinous coating.



- ❖ Vegetative reproduction by fragmentation.
- ❖ Asexual reproduction by biflagellate zoospores.
- ❖ Sexual reproduction may be isogamous, anisogamous or oogamous
- ❖ *e.g. Ectocarpus, Dictyota, Laminaria, Sargassum and Fucus*



Sargassum



Rhodophyceae (Red algae)

- ❖ Habitat – some fresh water, brackish water, mostly in salt water
- ❖ Pigments - chlorophyll *a and d*, r-phycoerythrin
- ❖ Food is stored as Floridean starch, which is similar to amylopectin and glycogen in structure.
- ❖ Vegetative reproduction is by fragmentation
- ❖ Asexually by non-motile spores
- ❖ Sexually by non-motile gametes
- ❖ e.g. Polysiphonia, Porphyra, Gracilaria, Gelidium



Gracilaria



Gelidium

