Biology Dept., College of Education, Salahaddin University - Erbil, Kurdistan region - Iraq

An Introduction about the Algae

Lab-1

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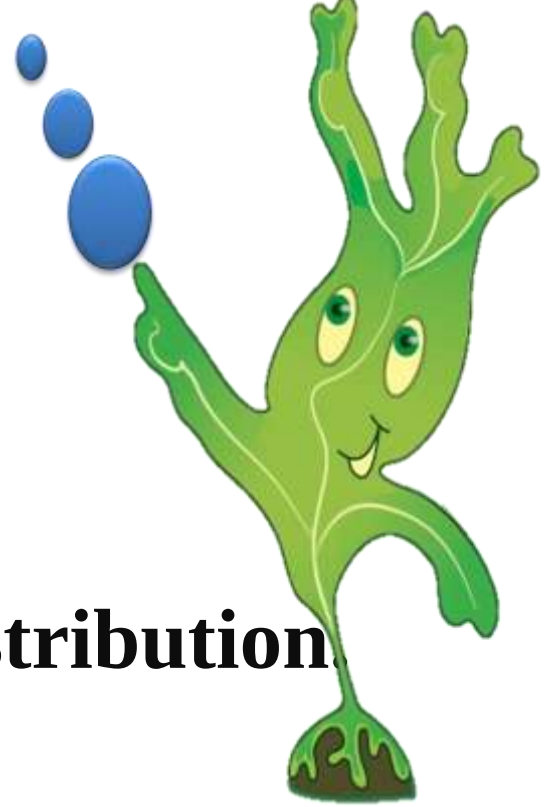
Outline

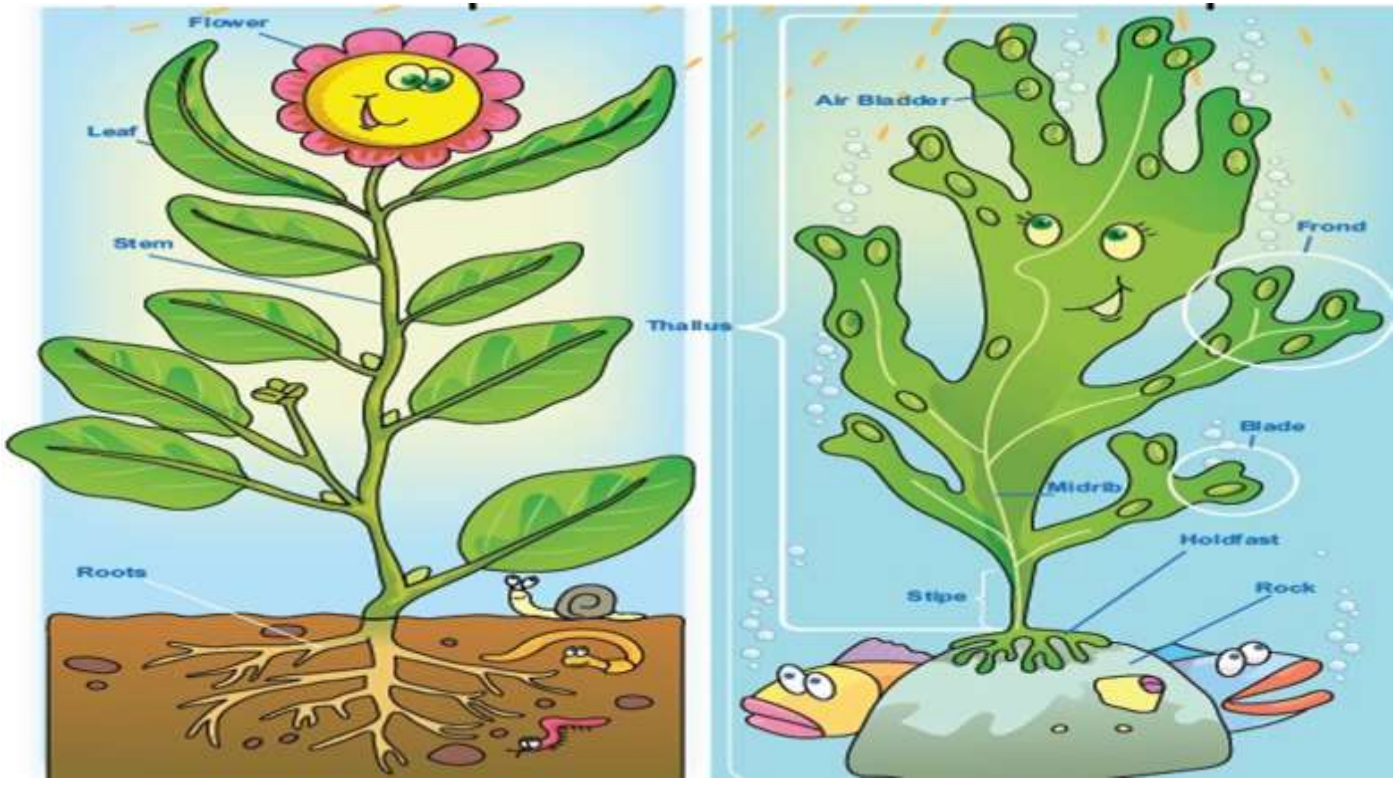


- **Introduction about algae.**
- **Classification, occurrence and distribution.**
- **Reproduction of algae.**
- **Forms of algae.**

Definition of Algae

- **Phycology:** is the science of **algae** study.
- Algae (singular called alga): are widely distributed in aquatic, terrestrial and unusual habitats.
- They are extremely diverse photosynthetic plants.

- The algal body is known **Thallus (Undifferentiated plant body)** because <u>its body is not developed into stems, roots, leaves.</u>
- The algae range in size and organization from diameter to highly organized macroscopic plants which may get lengths of 60 meter.



The classification of Algae

Algae have been mainly classified **on the basis** of the:

1. Composition of **cell wall**.
1. **Photosynthetic pigments**.
2. **Storage products** of **vegetative cells**.
3. Form of motile **reproductive cells**.
4. **Habitat**.

The Occurrence and Distribution of Algae

Aquatic algae may be:

A. Suspended **(Planktonic)**.
B. Attached and living in the bottom **(Benthous)**.

The benthic algae classified as:-

1. **Epilithic:** Living on stones.
2. **Epipelic:** Attached to mud or sand.
3. **Epiphytic:** Attached to plants.
4. **Epizoic:** Attached to animals.
5. **Cryophilic**: living on snow.
6. **Halophylic**: living on salty water.

The Occurrence and Distribution of Algae

Soil algae classified as:

- **Endedaphic:** Living in soil.
- **Epidaphic:** Living on the soil surface.
- **Hypolithic:** Living on lower surface of stones on the soil surface.

Whereas, rock algae including:

- **Chosmolithic:** Living in rock fissures.
- **Endolithic:** Living in rock penetrations.

Algal Reproduction

There are three common methods of reproduction found in algae:

1.Vegetative Reproduction: Unicellular algae may divide into two halves to produce new individuals. In **multicellular forms** the thallus often breaks into small fragments. Each of which grows to a new individual.

2. **Asexual Reproduction:** include the formation of one or more of the following types of spores**: zoospores**, **aplanospores, autospores, hypnospores**, **carpospores, tetraspores, endospores** and **exospores.**

Algal Reproduction:-

3. Sexual Reproduction: It means the **union of two gametes**.

- If the gametes are morphologically **similar**, the process is called (**Isogamous** sexual reproduction).

- If the gametes **differ** in size and motility the smaller and more active being male and the larger and less active being female, the process is known **An isogamous** sexual reproduction).

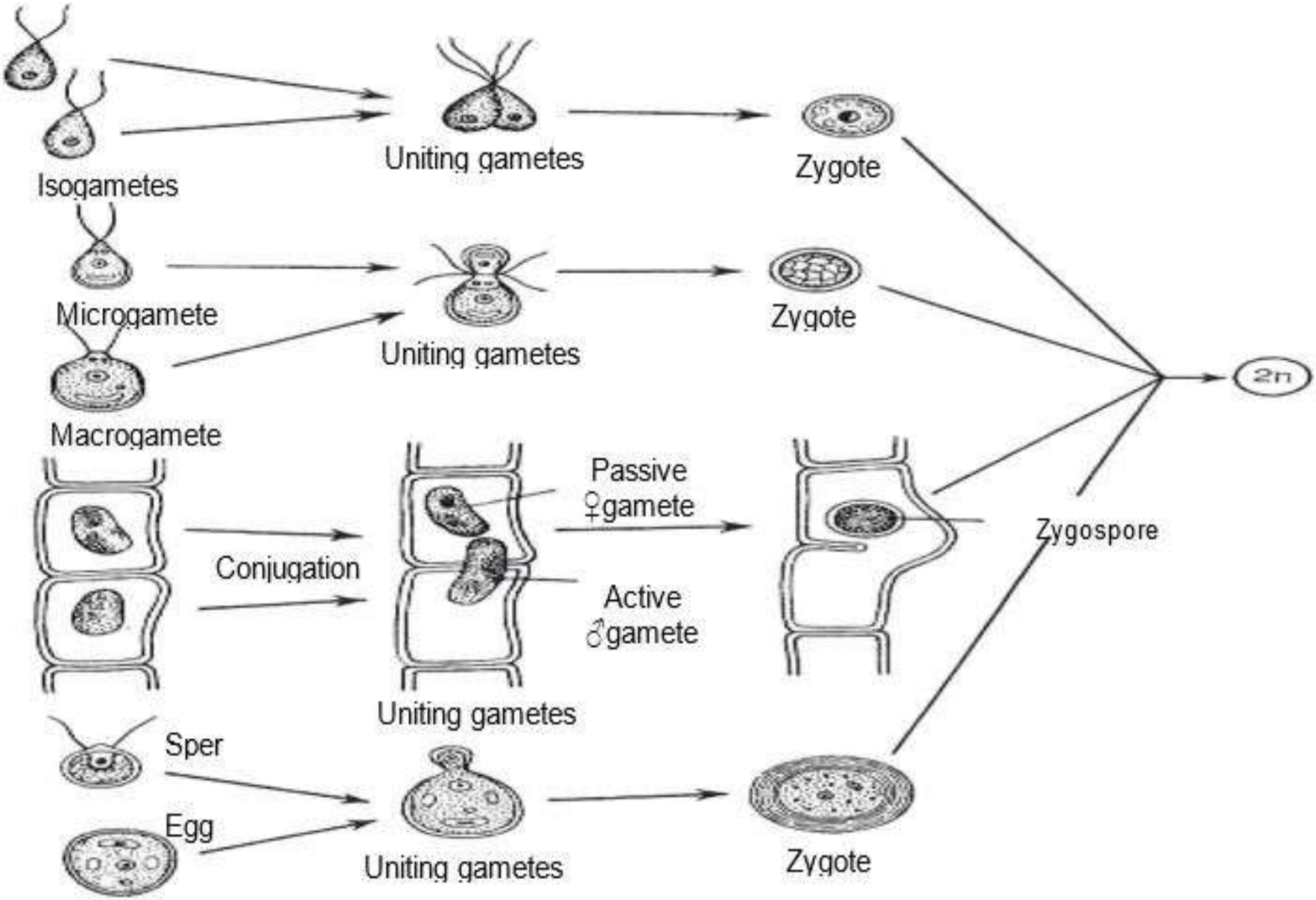
- If the gametes being **extremely different**, the larger – nonmotile one called egg and the smaller – motile one called sperm, the process is known **Oogamous** sexual reproduction) .

isogamy

anisogamy
= heterogamy

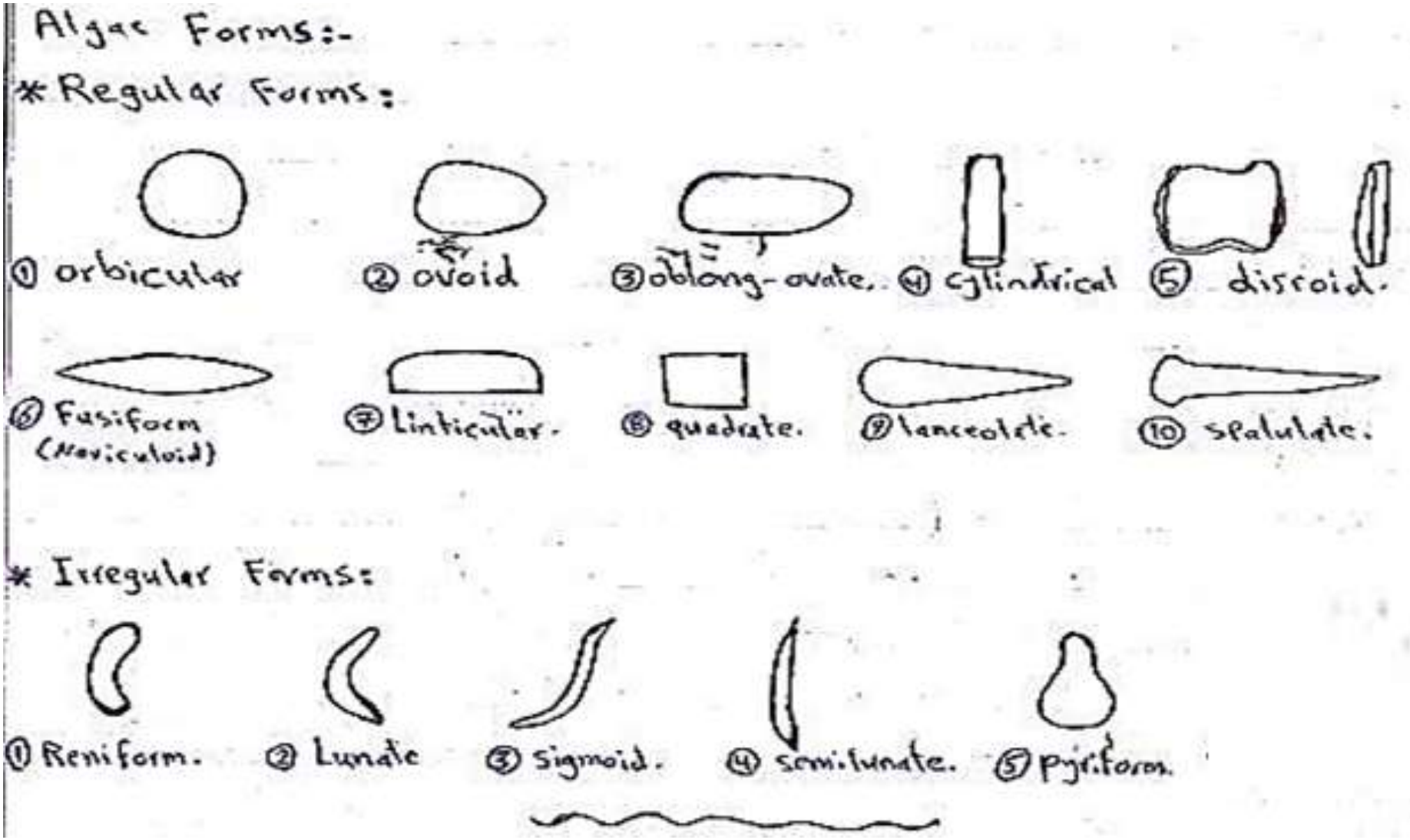
oogamy

Conjugation: is the type of sexual reproduction occurs between some filamentous algae like **zygnematales** group and dismediaceae, **forming conjugation tube between male and female filaments.**



Modes of Sextual Reproduction in Algae

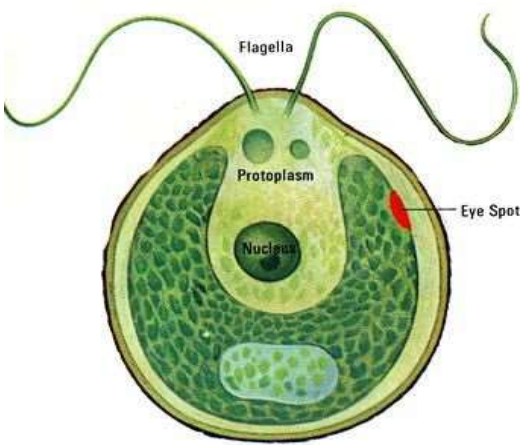
The forms of algae



Plastid Forms in Algae

- **Cup:** ***Clamydomonas*** *sp,* ***Volvox*** *sp.*
- **Discoid:** ***Vouchria*** sp*,* ***Chara*** *sp.*
- **Girdle:** ***Ulothrix*** *sp.*
- **Reticulate:** ***Oedogonium*** sp*,* ***Cladophora*** *sp.*
- **Spiral:** ***Spirogyra*** *sp.*
- **Star:** ***Zygnema*** *sp.*

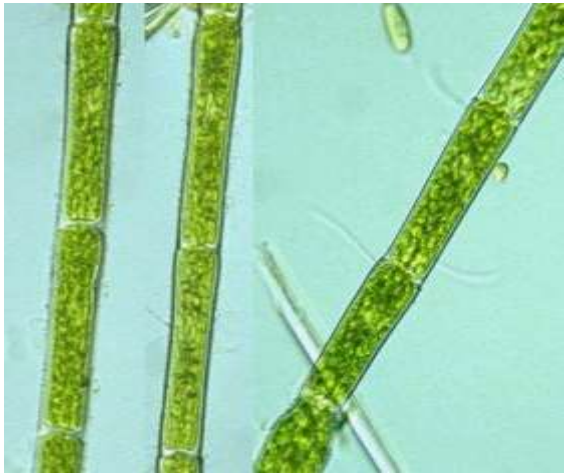
Plastid Forms in Algae



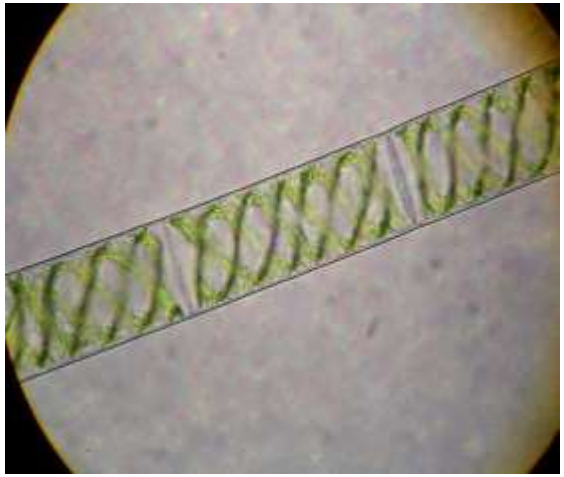
Clamydomonas sp

Vouchria sp

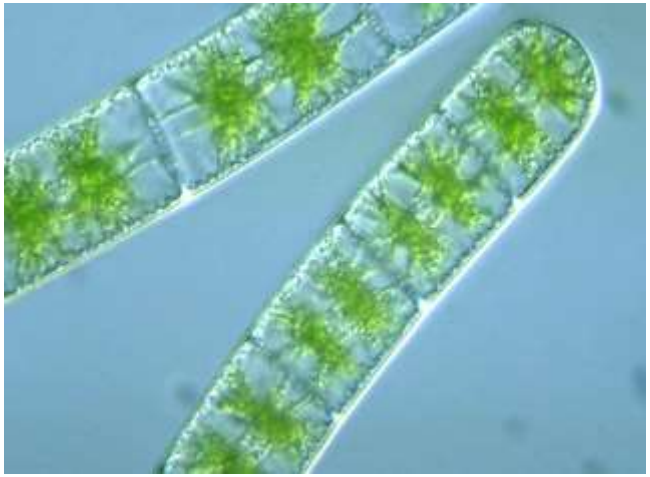
Ulothrix sp



Oedogonium sp



Spirogyra *sp*



Zygnema *sp*

Human-Algal interaction

Beneficial Effects of algae

- Used as **nutrient**, **food** and **carbon recycling.**
- Use **carbon dioxide to produce oxygen**.
- **Biosynthetic factories**. Can be used to produce drugs, antibiotics, alcohol, oil automobile and agar.
- **Model organisms for biochemical and genetic studies.**
- Can be used to **make biodiesel.**

Human-Algal interaction

Harmful Effects of algae

- **Human illnesses**, including **allergies.**
- **Toxins produced** by some species of poisonous algae to kill aquatic organism.
- **Pollute river, marine, sea and ocean (Red Tide).**
- **Plant diseases**.