



Key Takeaways

Kingdom Protista

- Chrysophyta
- Euglenophyta
- Pyrrophyta

Fungi-like Protists

- Slime moulds

Animal-like Protists

- Ameboid protozoans
- Flagellated protozoans
- Ciliated protozoans
- Sporozoans



Prerequisites

- **Biological classification** - Study of the arrangement of organisms in a hierarchy based on their similarities and differences.
- **Levels of biological classification**
 - Two Kingdom by Carolus Linnaeus
 - Three Kingdom by Ernst Haeckel
 - Four Kingdom by Herbert Copeland
 - Five Kingdom by R.H. Whittaker
 - Six Kingdom by Carl Woese

Kingdom Protista

- They are **single-celled/colonial eukaryotes**.



Euglena

Kingdom Protista - Eukaryotic Grab Bag Kingdom



Slime mould



Amoeba



Diatom



Macroalgae



Euglena



Dinoflagellate



Paramecium

A “grab bag” is an assortment of very diverse items. Kingdom Protista is called the “grab bag kingdom” because it includes organisms that just do not fit into other kingdoms.

Mode of Nutrition

Photosynthetic



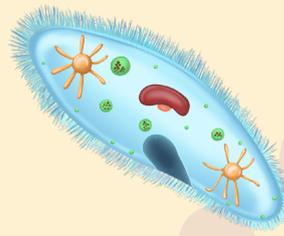
Diatoms

Saprophytic



Slime moulds

Holozoic



Paramecium

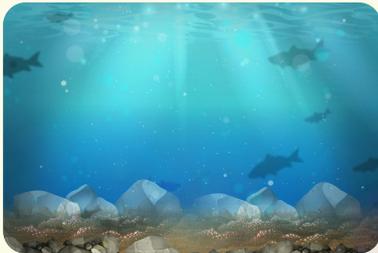
Parasitic



Plasmodium

Habitat

◦ Aquatic



Marine

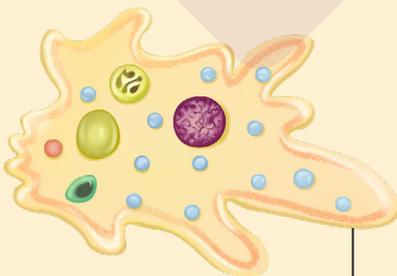


Freshwater

Locomotory organs

Pseudopodia

Pseudopodia are extensions of the cell cytoplasm covered by the cell membrane.

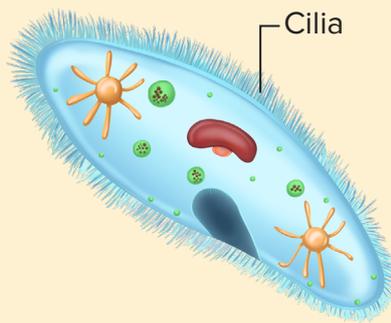


pseudopodia

Amoeba

Cilia

Cilia are slender, hair-like projections extending from the cell.

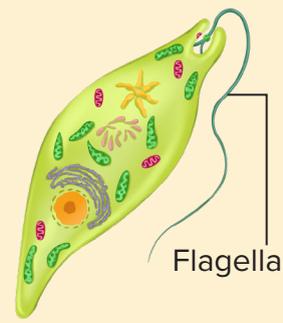


Cilia

Paramecium

Flagella

Flagella is a whip-like projection from the cell body.



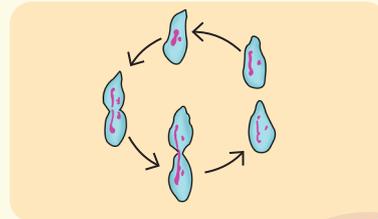
Flagella

Euglena

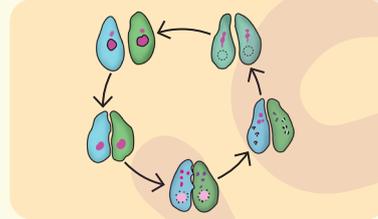
Reproduction

Reproduction

Asexual



Sexual



Classification of Kingdom Protista

Kingdom Protista

Plant-like

Fungi-like

Animal-like

Chrysophyta

Pyrrophyta

Euglenophyta

Diatoms

Desmids

Plant-like Protists: Chrysophyta

- They are also known as **golden algae**.
- They live in **freshwater** and **marine environments**.
- Most of them are **photosynthetic**.
- They float passively in water currents (plankton).



Golden Algae

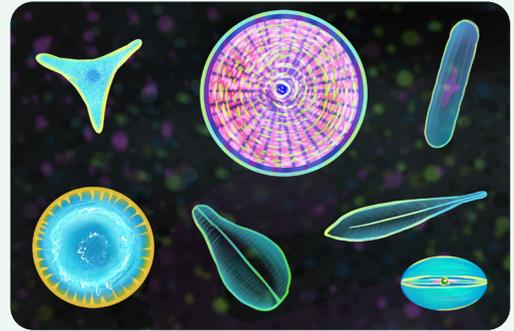
Chrysophytes

Diatoms

Desmids

Diatoms

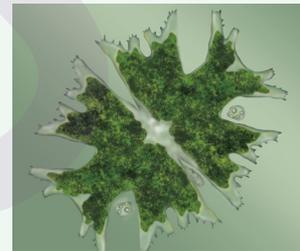
- They are the **chief producers** of the ocean.
- They are **unicellular** or **colonial**.
- Their **cell walls have silica**.
- They are mostly **non-motile** or show **gliding movement**.
- **Dead diatoms** form **diatomaceous earth**.
- Fossilised geological deposits of diatoms are called **diatomaceous earth**.
- They are used in the following:
 - Metal polishes
 - Filtration of oils and syrups
 - Toothpaste
 - Facial scrubs



Diatoms - Jewels of the Plant Kingdom

Desmids

- They are **unicellular** and **microscopic**.
- They have two halves that are connected by an **isthmus**.
- They have a golden hue due to pigment **fucoxanthin** and **oil droplets**.
- Their **food reserve** is in the form of oil droplets.

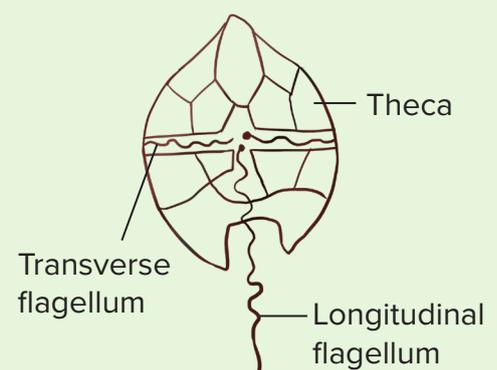


Desmids

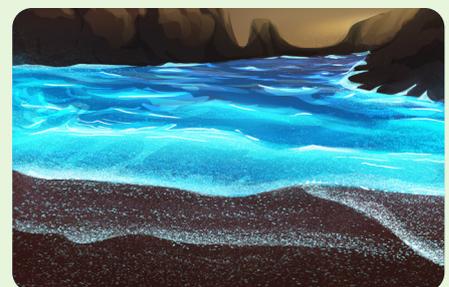
Plant-like Protists: Pyrrophyta

- Organisms of Pyrrophyta are commonly known as **dinoflagellates** because of the presence of two flagella (biflagellate) beating in different directions.
- They are **microscopic unicellular** organisms.
- They are mostly **marine** and **photosynthetic**.
- They are **motile** due to the presence of flagella.
- Their cell walls (**theca or lorica**) are made of sculpted cellulose plates.
- They have a **mesokaryon**:
 - “Meso” means “in-between” or “intermediate”.
 - “Karyon” means nucleus.
 - Mesokaryon are a very large nucleus.
- Colour of Pyrrophyta:
 - They are predominantly golden brown.
 - Yellow, green, brown, blue, or red colour is also seen due to the presence of pigments.
 - Some exhibit bioluminescence.

For example, *Noctiluca*(Night light).



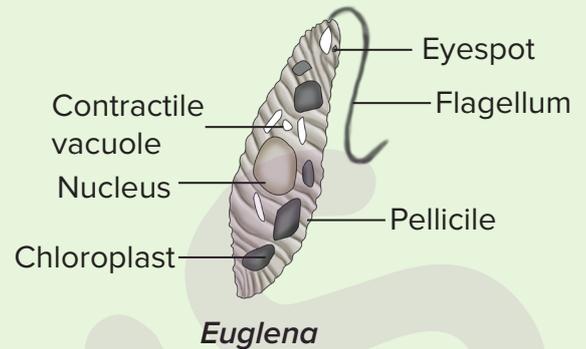
Dinoflagellates



Plant-like Protists: Euglenophyta

Euglenoids

- They are **unicellular, biflagellate**, and **microscopic**.
- They are **freshwater organisms**.
- They have **pellicle** instead of a cell wall.
- They are **motile**.
- Mode of nutrition:
 - In the **presence of sunlight**, it carries out **photosynthesis**. In the **absence of sunlight**, it has a heterotrophic mode of nutrition.
 - It is a **holozoic** organism. It obtains nutrition by **ingesting** food.
- Hence, it is a **link between plants and animals**.



Fungi-like Protists: Slime moulds

- They are unicellular.
- They are called **decomposer protists**. They are found in decaying vegetation in lawns and moist fields. They contribute to the decomposition of the decaying matter.
- Resemble both fungi and animals and hence are known as **fungus animals**.
- They have **amoeboid plasmodial stages** like protozoans.
 - The plasmodial stage consists of large multinucleate cells which are covered by a single cell membrane.

Plasmodial Slime Moulds vs *Plasmodium*



Slime Moulds

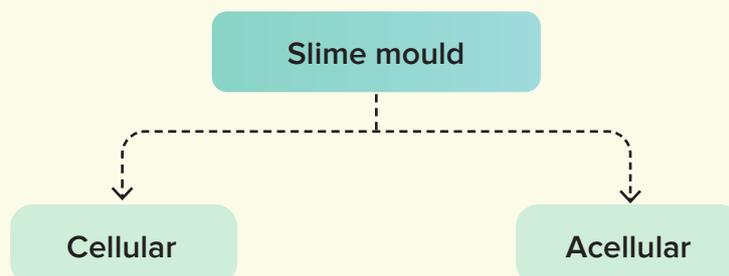
Plasmodial slime moulds are large multinucleate cells.



Plasmodium

Plasmodium is a parasitic cell that causes diseases.

- They form spores like fungi.



Cellular slime moulds

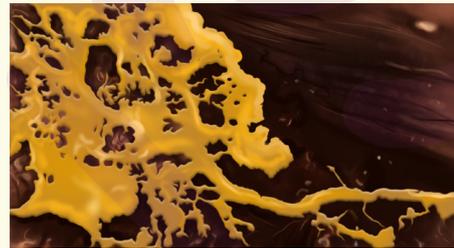
- They are **amoeba-like** cells with **no cell wall**.
- They move and capture food by **pseudopodia**.
- They remain **grouped but as unfused cells**.



Cellular Slime Moulds

Acellular slime moulds

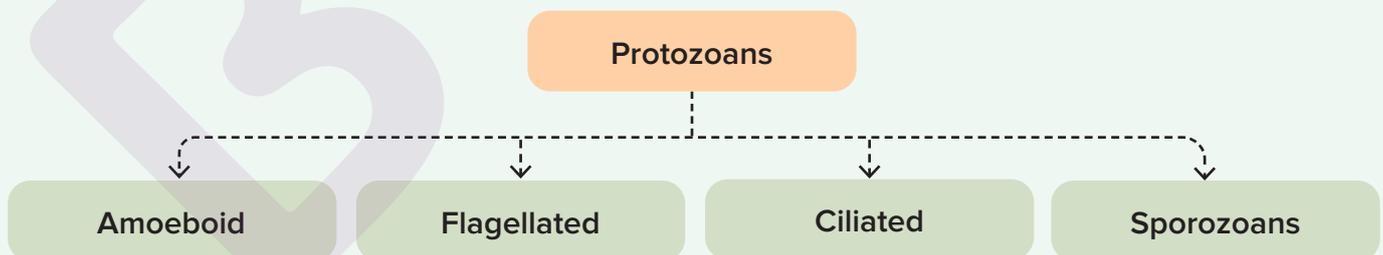
- It forms **plasmodium** under suitable conditions. Here, plasmodium is the type of body which is made up of multinucleated protoplasmic mass.
- They **do not have a cell wall** and are **multinucleated**.
- They grow and spread over several feet and **form spores** during unfavourable conditions.



Acellular Slime Moulds

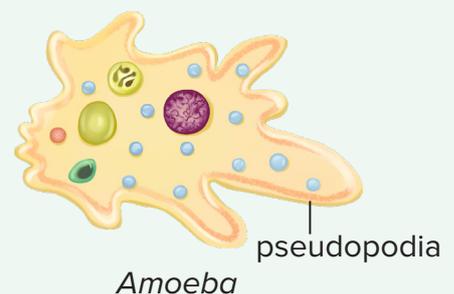
Animal-like Protists

- They are **unicellular**.
- They are mostly **heterotrophs**.
 - Holozoic
 - Parasitic
- They may or may not possess **structures for locomotion**.
- They are classified as follows based on the locomotory structures:



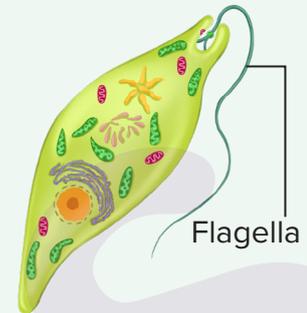
Amoeboid Protozoans

- They live in **freshwater, seawater, or moist soil**.
- They show **amoeboid movement** (pseudopodia).
- The marine forms have **silica shells** on their surface.
- Some are **parasites**.
- Examples: *Amoeba*, *Entamoeba histolytica*



Flagellated Protozoans

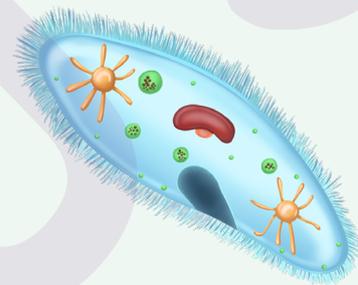
- They are **free-living** or **parasitic**.
- They are **flagellated**.
- They are **marine** and **freshwater** organisms.
- They may cause diseases such as sleeping sickness.
- Specifications of sleeping sickness are as follows:
 - Caused by *Trypanosoma brucei*
 - Transmitted by the Tsetse fly
 - Alters neuronal function



Euglena

Ciliated Protozoans

- They are **aquatic**.
- **Cilia** helps in **locomotion** and **feeding**.
- **Digestion** takes place in **food vacuoles**.
- Waste material is excreted through the **anal pore**.
- Examples: *Paramecium*, *Vorticella*.



Paramecium

Sporozoans

- They are **parasites** of animals that **cause diseases**.
- There is an **absence** of **flagella**, **cilia**, or **pseudopodia**.
- They show **gliding movements**.
- They may have more than one host.
- Example: *Plasmodium* (malarial parasite)



Plasmodium



Summary Sheet

