Department of biology

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((Plant groups))

Stage (2)

Fifth lecture

Euglenophyta

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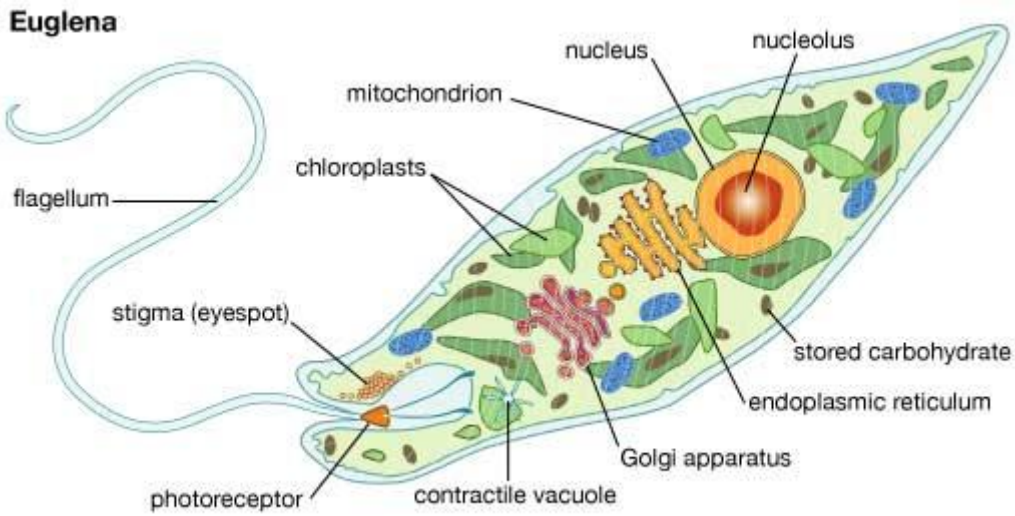
Euglenophyta

A unicellular algae with a circular or pointed end. At the front of the body, a flask-shaped swelling is noted, which is characterized by a widened basal part called the reservoir, and a flagellum protrudes from the base of the reservoir, extending outside the apical structure. The plastid is multicellular and appears in different shapes depending on the type of alga. The nucleus is single, large, in the middle of the cytoplasm or located in the posterior third of the cell. It reproduces vegetatively by longitudinal fission.

Environment and presence

- This division includes about 30 genera and 450 species, usually found in fresh waters.
- Few of them are found in salt water and are usually observed in small ponds rich in organic matter. They may be found on wet mud in river estuaries. Some of the spore-bearing genera grow on the remains of Plants, on the bodies of some crustaceans, or inside the intestines of some amphibians.



General characteristics of Euglenophyta

1) Most of the genera are unicellular motile, some are non-motile or in the form of groups, and a few are in the form of colonies.

2) Plastids are of different shapes, discoid, lamellar, ribbon, star, or lenticular.

3) Pigments include chlorophyll a and b, carotene, and multiple xanthophylls.

4) The cells lack the presence of a cellulose cell wall and are surrounded by the plasma membrane.

5) Stored food consists of polysaccharide compounds stored in granules called paramylum granules, which are in the form of straight chains of glucose.

6) Stored in the cytoplasm or in plastids. Cells contain one, two or three feathery flagella that usually protrude from the base of the reservoir at the front of the cell.

Appearance

A unicellular algae with a circular or pointed end. At the. front of the body, a flask-like swelling is noted, distinguished by a widened basal portion called the reservoir and a canal called the pharynx. A flagellum protrudes from the base of the reservoir and extends beyond the infundibulum. Plastids are numerous and appear in various shapes. The nucleus is large and lies in the middle of the cytoplasm, sometimes located in the posterior third of the cell and is fixed in position. Paramyelium granules appear in disc- or rod-shaped shapes in the cytoplasm. The cell is surrounded by a plasma membrane, beneath which lie bands with ridges

and grooves that overlap each other. These bands, along with the plasma membrane, are called periplasts, composed mainly of proteins, in addition to a small percentage of lipids and carbohydrates.

Periplasts are flexible, allowing the algae to change shape during movement.

The periplast consists Plastids are surrounded by a two-layer membrane and an outer layer of endoplasmic reticulum.

Photosynthetic plates (thylakoids): Each plate consists of 62 discs, usually 3 discs per plate.

Stored food granules appear in the cytoplasm in various shapes and sizes. They are insoluble carbohydrates similar to starch.

At the front of the cell is a flask-shaped swelling, the basal part of which is widened, representing the

reservoir and the pharyngeal canal. At the base of the swelling is the eyespot, which is large and located outside the plastids. It consists of a group of up to 20 lipid droplets containing the pigment carotene B, which gives it its reddish-orange color. Each droplet is surrounded by its own membrane. These droplets appear in the form of a convex lens and are involved in responses to light stimuli. They are believed to be sites for light reception and control of cell movement, such as phototropism. They are also believed to be responsible for steering the flagellum.

The cell contains mitochondria, which are elongated structures, and the Golgi apparatus.

The cell contains two flagella, one of which is short and does not protrude beyond the reservoir channel.

The other flagellum is long and aids in the movement

of the algae. It may be longer than the length of the algae's body and has two rows of hairs. Mastigonema is a Pantanematic type.

Nutrition

Nutrition varies in Euglena. It may be autotrophic or heterotrophic. Some have the ability to grow in the dark when an organic carbon source is available. Others may have an animal nutrition by ingesting food particles through the reservoir, as in the colorless genus ***Peranema***.

It feeds in three ways:

1. Plant nutrition through photosynthesis.

2. Animal nutrition through the ingestion of solid objects such as bacteria.

3. Absorbing dissolved organic matter by membrane diffusion.

The Movement

Is accomplished by flagella. The cell may contain one, two, or three flagella. The flagella are usually of the tensile type and may contain one or two rows of filaments. Movement occurs in a manner similar to that of motile green algae.

Reproduction

By longitudinal fission, simple binary vegetative reproduction is achieved. The moss performs this type of reproduction under suitable conditions. It begins by splitting lengthwise from the front of the moss, extending to the back. At the same time, the nucleus divides by simple binary fission. Each half of the nucleus moves toward half of the cell, and each split grows to produce a new cell.

Cyst formation

The moss resorts to these cysts in unfavorable conditions. The moss begins to lose its flagellum and secrete a thick gelatinous sheath around itself, enabling it to resist unfavorable conditions. When conditions improve, the internal contents divide into several units: 2, 4, or 8. Each unit, when released, can grow into a new moss. Sexual reproduction is not specifically known in these algae.