20-3 Plantlike Protists: Unicellular Algae

20-3 Plantlike Protists: Unicellular Algae

Plantlike protists contain chlorophyll and carry out photosynthesis.

Plantlike protists are commonly called “algae.”

Algae are sometimes classified with the plants.

20-3 Plantlike Protists: Unicellular Algae

The four phyla of unicellular algae are:

- euglenophytes
- chrysophytes
- diatoms
- dinoflagellates

Chlorophyll and Accessory Pigments

What is the function of chlorophyll and accessory pigments in algae?

Chlorophyll and accessory pigments allow algae to harvest and use the energy from sunlight.

One trait used to classify algae is the type of photosynthetic pigments they contain.

Some algae have evolved different forms of chlorophyll—*a, b*, and *c*—that absorb different wavelengths of light.

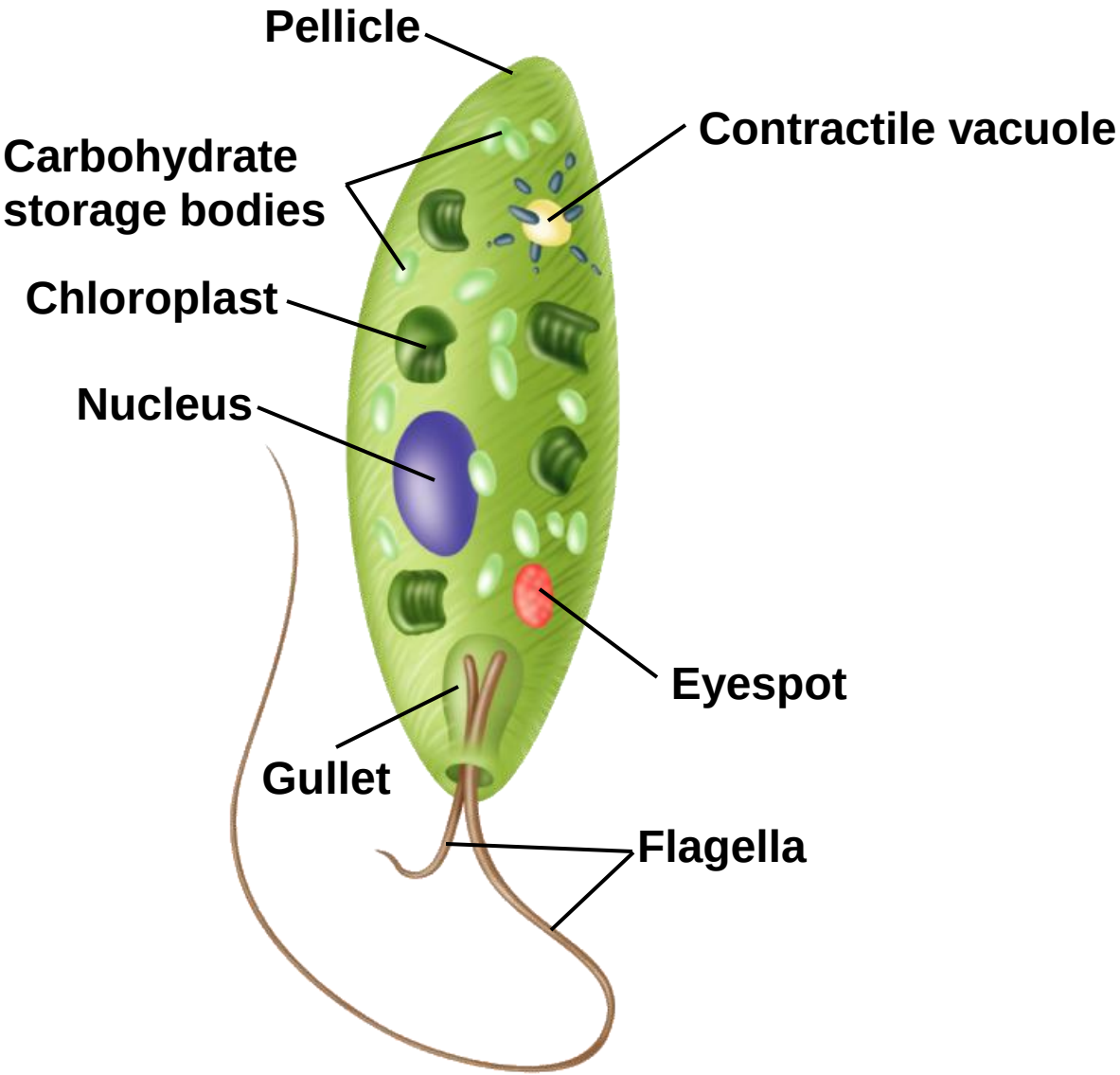
Accessory pigments absorb light at different wavelengths than chlorophyll, giving algae a variety of colors.

Euglenophytes

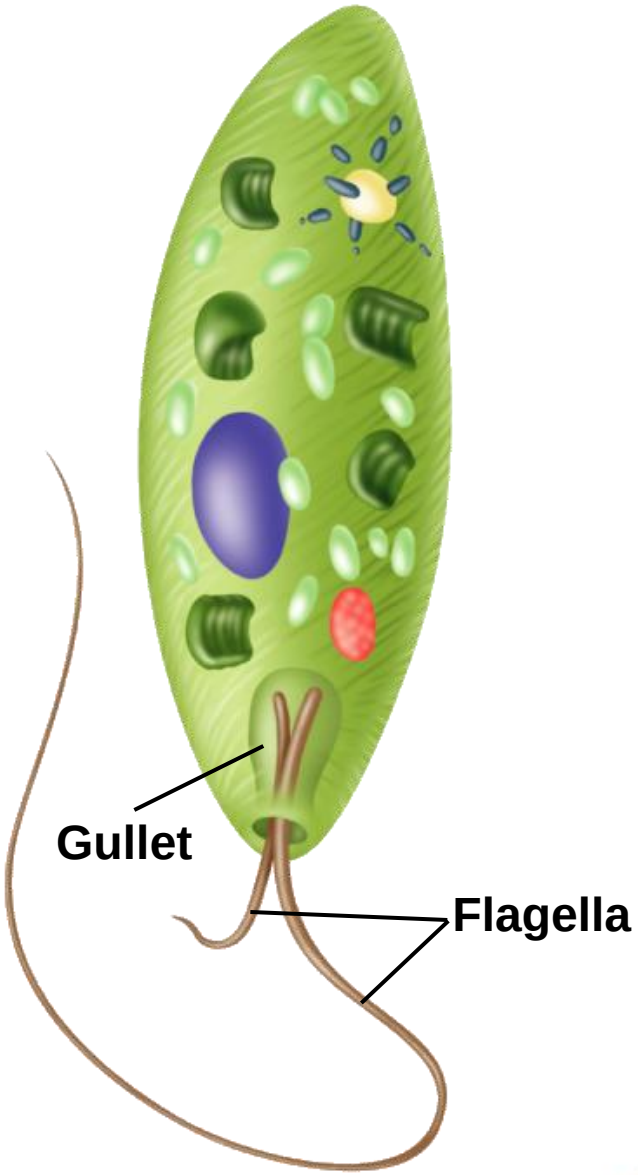
What are the distinguishing features of the euglenophytes?

Euglenophytes are plantlike protists that have two flagella but no cell wall.

Euglena

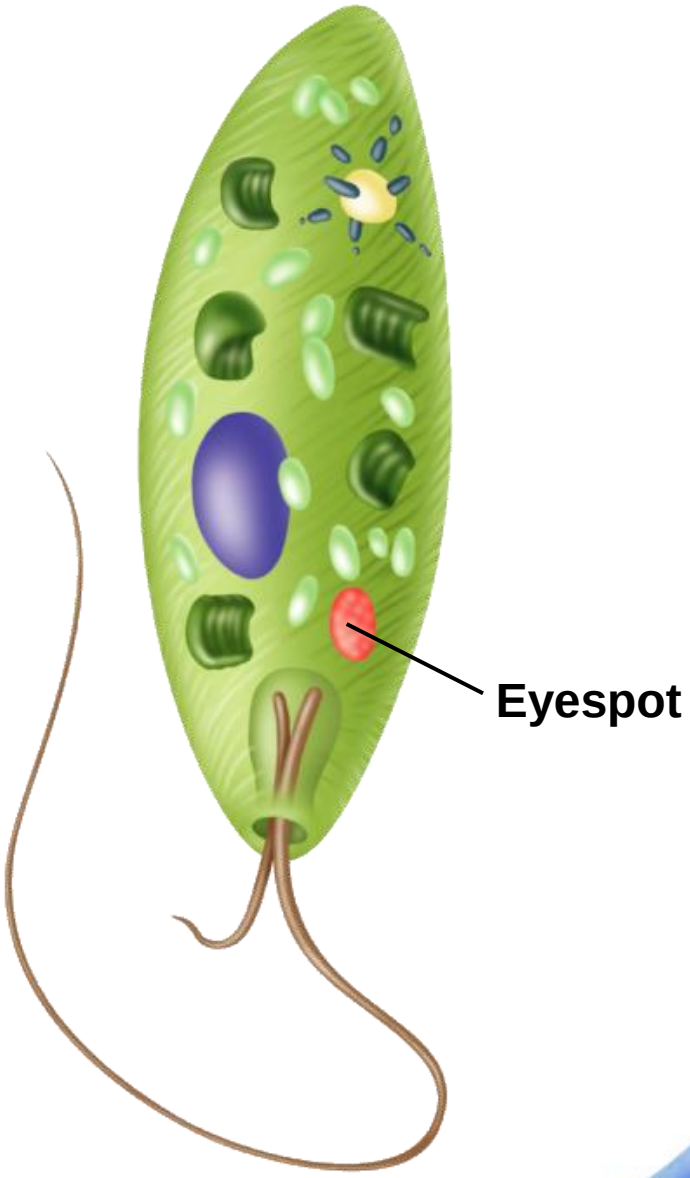


Two flagella emerge from a gullet in the cell. The longer of the flagella spins so it pulls the organism rapidly through the water.

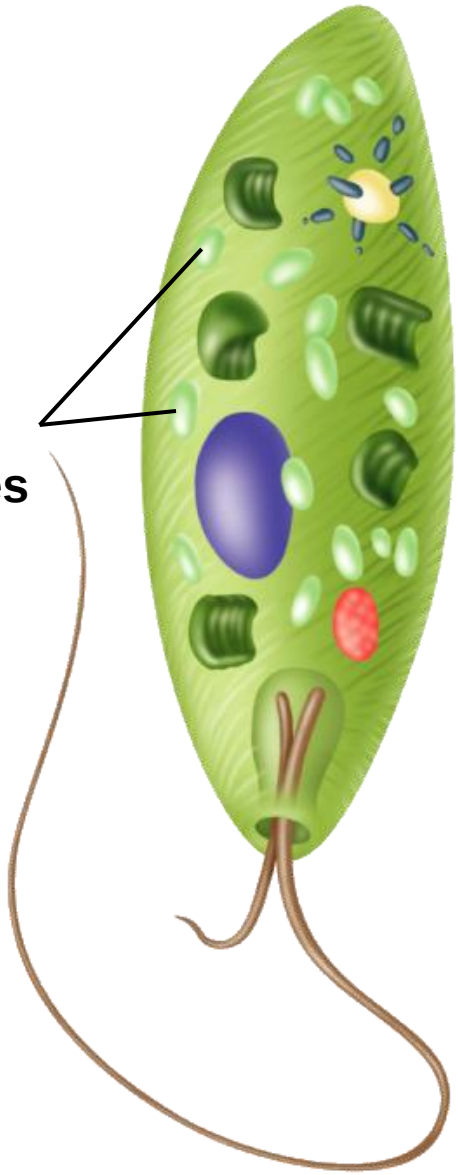


Near the gullet is a reddish pigment known as the **eyespot**, which helps find sunlight to power photosynthesis.

Euglenas can also live as heterotrophs.

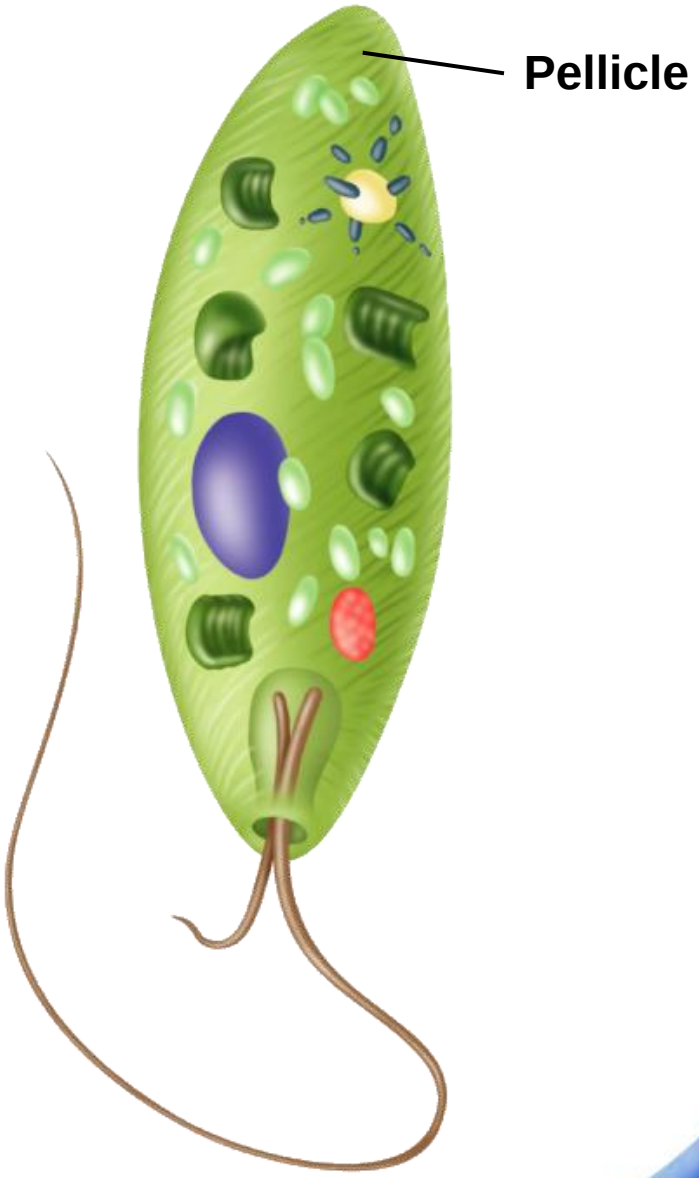


Euglenas store carbohydrates in small storage bodies.



Euglenas do not have cell walls. Instead, they have an intricate cell membrane called a **pellicle**.

The pellicle folds into ridges, each supported by microtubules.



Euglenas reproduce asexually by binary fission.

Chrysophytes

What are the distinguishing features of the chrysophytes?

Members of the phylum Chrysophyta are a diverse group of plantlike protists that have gold-colored chloroplasts.

The cell walls of some chrysophytes contain the carbohydrate pectin rather than cellulose, and others contain both.

Chrysophytes store food in the form of oil rather than starch.

They reproduce both asexually and sexually.

Most are solitary, but some form threadlike colonies.

Diatoms

What are the distinguishing features of the diatoms?

Diatoms produce thin, delicate cell walls rich in silicon (Si)—the main component of glass.

The walls are shaped like the two sides of a petri dish or flat pillbox, with one side fitted snugly into the other.

Dinoflagellates

What are the distinguishing features of the dinoflagellates?

About half of the dinoflagellates are photosynthetic; the other half live as heterotrophs.

Dinoflagellates have two flagella that fit in grooves between two thick plates of cellulose that protect the cell.

Most dinoflagellates reproduce asexually by binary fission.

Many dinoflagellates are luminescent. When they are agitated, they give off light.

Ecology of Unicellular Algae

Plantlike protists are important to freshwater and marine ecosystems because they make up the base of the food chain in many aquatic ecosystems.

Phytoplankton constitute the population of small, photosynthetic organisms found near the surface of the ocean.

Phytoplankton carry out half of Earth's photosynthesis. In addition, they provide nourishment for many organisms.

Algal Blooms

Many protists are vital in recycling sewage and other wastes.

When waste is excessive, algae may grow into enormous masses known as blooms, which deplete water of nutrients.

Their decomposition robs water of oxygen, killing fish and invertebrate life.

20-3 Section QUIZ

Continue to:

Section QUIZ

- or -

Click to Launch:

ExamView® QuickTake

20-3 Section QUIZ

1 The function of accessory pigments in various groups of algae is to

a. absorb red and violet light.

b. carry out photosynthesis in the absence of chlorophyll.

A c. increase the range of wavelengths used for photosynthesis.

d. carry out photosynthesis when sunlight is not available.

2 Which of the following describes structures found in euglenophytes?

A a. chloroplasts but no cell walls

b. chloroplasts and cell walls

c. cell walls but no chloroplasts

d. no cell walls or chloroplasts

3 Plantlike protists with gold-colored chloroplasts are the

a. euglenophytes.

b. diatoms.

A c. chrysophytes.

d. dinoflagellates.

4 The base of most marine food chains is made up of

a. zooplankton.

b. euglenophytes.

A c. phytoplankton.

d. chrysophytes.

5 The effect of algal “blooms” on other organisms is that they

A

a. poison consumers that eat filter-feeders such as clams.

b. serve as an important food source for fish and crustaceans.

c. decompose dead and decaying organisms.

d. convert inorganic molecules into energy-rich food molecules.

END OF SECTION