

Kingdom Protista

The protists are eukaryotes; their cells have a nucleus. Unicellular organisms are predominant, and even the multicellular forms lack the tissue differentiation that is seen in more complex organisms. The protists are grouped according to their mode of nutrition and other characteristics into these categories:

Algae	Protozoans	Slime Molds	Water Molds
Phylum Chlorophyta: green algae	Phylum Sarcodina: amoebas and allies	Phylum Gymnomycota: slime molds	Phylum Oomycota: water molds
Phylum Phaeophyta: brown algae	Phylum Ciliophora: ciliates		
Phylum Chrysophyta: diatoms	Phylum Zoomastigophora: zooflagellates		
Phylum Dinoflagella: dinoflagellates	Phylum Sporozoa: sporozoa		
Phylum Euglenophyta: euglenoids			
Phylum Rhodophyta: red algae			

Algae

Algae are autotrophic by photosynthesis like plants that produce the food to maintain communities of organisms in both the oceans and bodies of fresh water. All algae contain chlorophyll, but they may also contain other pigments that mask the color of the chlorophyll.

Algae are grouped according to their color (green, golden brown, brown, and red algae) and biochemical differences, such as the chemistry of the cell wall and the way they store reserve food.

Phylum Chlorophyta: Green Algae

Live in the ocean, but they are more likely found in fresh water and can even be found on land. Green algae are believed to be closely related to the first plants because both of these groups:

- (1) Have a cell wall that contains cellulose.

(2) Possess chlorophylls a and b.

(3) Store reserve food as starch inside the chloroplast. (Other types of algae store reserve food outside the chloroplast.)

Examples:

Types		Example	Chloroplast shape
Unicellular Algae	Green	<i>Chlamydomonas</i>	Single, cup-shaped chloroplast
Colonial Green Algae		<i>Volvox</i>	
Filamentous Algae	Green	<i>Spirogyra</i>	Ribbonlike
Multicellular Algae	Green	<i>Ulva</i>	

Phylum Phaeophyta: Brown Algae

Phylum Chrysophyta: Golden Brown Algae

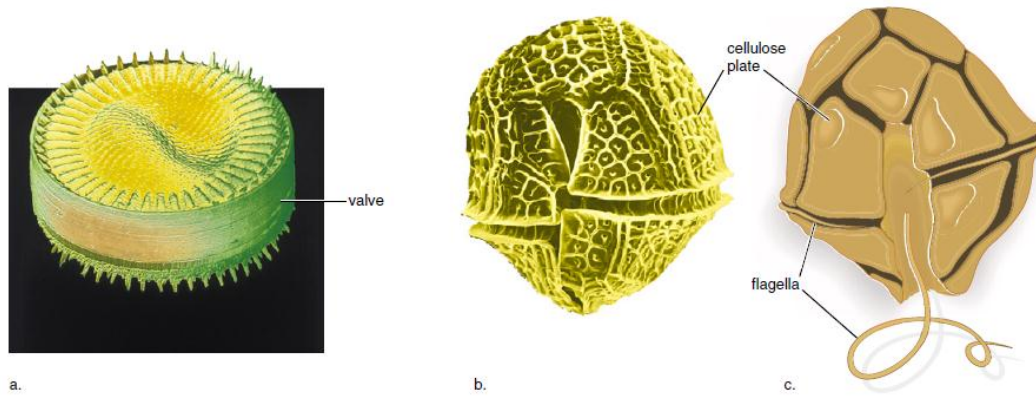
Brown and golden-brown algae have chlorophylls *a* and *c* in their chloroplasts and a type of carotenoid pigment (fucoxanthin) that gives them their color.

Brown algae range from small forms with simple filaments to large blade forms between 50 meters and 100 meters in length.

Diatoms are a type of unicellular golden-brown algae. The structure of a diatom is often compared to a box because the cell wall has two valves, with the larger valve acting as a “lid” for the smaller valve.

Phylum Dinoflagella: Dinoflagellates

Many dinoflagellates are bounded by protective cellulose plates. Most have two flagella; one is free, but the other is located in a transverse groove. The beating of the flagella causes the organism to spin. When surface waters are warm and nutrients are high, there are so many of these unicellular organisms in the ocean that they cause a condition called “**red tide.**” Toxins in red tides cause widespread fish kills.



a. Diatoms, b. Dinoflagellates

Phylum Euglenophyta: Euglenoids

Are small, freshwater unicellular organisms in which One-third of all genera have chloroplasts; the rest do not. Euglenoids have two flagella, one of which typically is much longer than the other and projects out of an anterior vase-shaped invagination. There is a contractile vacuole for ridding the body of excess water.

Phylum Rhodophyta: Red Algae

Are multicellular, but they live chiefly in warmer seawater, growing in both shallow and deep waters. Red algae are usually much smaller and more delicate than the brown algae, although they can be up to a meter long. Some forms of red algae are simple filaments, but more often they are complexly branched, with the branches having a feathery, flat, or expanded ribbonlike appearance. Example: Coralline algae.

Their economic importance: culture medium for bacteria and food preparation (agar). For making dental impressions, and base for cosmetics.

