



ALGAE

What is algae?

Algae are unicellular or multicellular organisms that photosynthesize, but lack the features such as leaves, roots, seeds and flowers of the 'higher' vascular plants (mosses, flowering plants, liverwort etc). Algae have a wide ranging classification, falling within several groups from plants through to protists (single celled organisms) and even bacteria (blue-green algae). They can commonly be found in aquatic—both freshwater and marine—environments, but can be found in damp terrestrial environments or even dry environments where they can live in symbiosis with fungus as lichen! Many algae species move themselves through the water column, while others float, attach themselves to objects in water or are terrestrial. Algae form an important part of many ecosystems and have a vast variety of body shapes, biochemistries and life cycles.

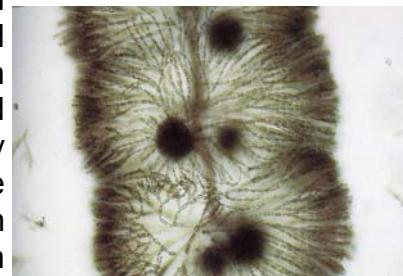


Photo: Jason Sonneman

Batrachospermum - red algae
(not all are red!)

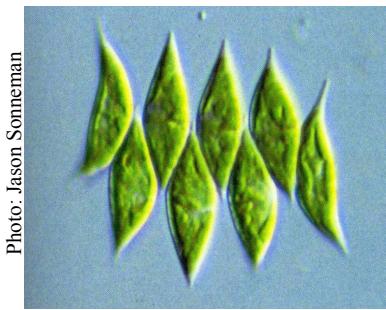


Photo: Jason Sonneman

Scenedesmus - green algae

Shades of Algae

Algae have cells called chloroplasts that take light energy from the sun and convert it into chemical energy that the organism can use. These chloroplasts can be anywhere from yellow to brown, blue-green to bright green and red; therefore algae can come in a variety of colours. It is unknown how many species of algae occur in Australia but here are over 3000 species that have been reported so far. Most of these are too small to see with the naked eye and a magnifying glass or a microscope is needed.

Why is algae important?

Algae play a vital role in the aquatic ecosystem. They provide food and shelter for other organisms and are important in the process of absorbing nutrients and toxins. They are also critical in fixing carbon and creating atmospheric and dissolved aquatic oxygen.

Algae are also economically important, being utilised in a number of ways: source of beta-carotene, glycerol, alginates; a food source for fish and other farmed animals; an important human food source; fertiliser; pollution control agents; and as a fuel source—oil from algae can be used to create biodiesel! Phycologists are still being surprised with new species when they sample a new area. Unfortunately, algal habitats are being destroyed or altered faster than new species are being discovered!



Photo: Jason Sonneman

Cladophora - filamentous green algae



A Closer Look at a Few Different Types of Algae

Diatoms - are delicate, single-celled organisms with cell walls made of silica making them almost look like little glass houses. They are free floating or attached to objects or other algae in the waterway. They can be found in almost all water types. They can be pennate (pen-shaped) or centric (like a cylinder). Pennate are the most common.

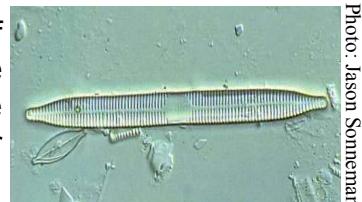


Photo: Jason Sonneman
A diatom called *Fragillaria*

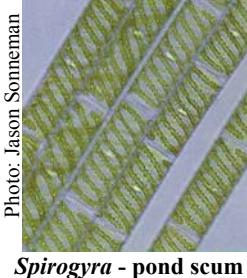


Photo: Jason Sonneman
Spirogyra - pond scum

Green Algae (Chlorophytes) - This is the most common type of algae (2000 species in Australia alone) and is the culprit for common pond scum. While commonly green, not all green algae is green! Have you ever observed a bird bath that has filled with a red algae? Well, that is actually a type of green algae! Incorporated into the green algae group are **desmids**. Desmids are only found in freshwater, are recognized by their precise symmetry and are quite beautiful to look at under a microscope.

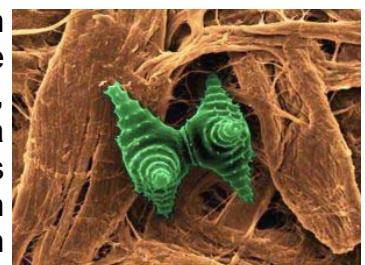


Photo: Jason Sonneman
Desmid

Dinoflagellates (Dinophyta)- These algae get their name from the flagella (hair-like projection used for locomotion) they possess. The cell wall of many dinoflagellates is divided into plates of cellulose like a suit of armour. Dinoflagellates are the organisms responsible for the toxic 'red tides' that are quite frequent along sections of the North American coast.

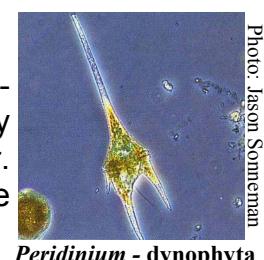


Photo: Jason Sonneman
Peridinium - dinophyta

Blue-Green Algae (Cyanobacteria) -What makes this particular type of algae unique is that it is actually a *bacteria* that has the ability to photosynthesize. It is one of the most commonly known types of algae, probably due to the toxic conditions some species can create when they bloom. An *algal bloom* occurs when algae flourish to such an extent that they dominate the water column, often discolouring the water or creating a scum on the surface. Blue-green algal blooms tend to occur in water that is nutrient rich, warm and calm. Blue-green algae often out-competes other types of algae in these conditions because of its ability to regulate its position in the water column.

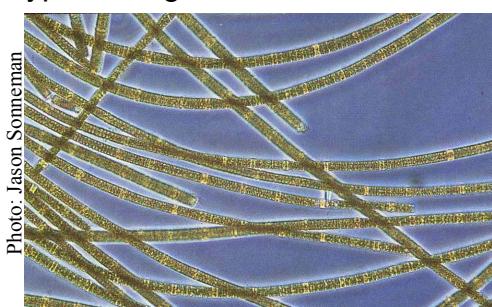


Photo: Jason Sonneman
Cyanobacteria - Nodularia

Blue-green algal blooms can be quite hazardous to humans and animals due to the toxins some species produce. A variety of toxins may be produced depending on the species present and can have varied effects from skin and eye irritation, through to liver damage, and even death.

Well mixed waters may help reduce the risk of blue-green algae blooms as will the management of nutrient inputs into waterways through changing land use practices. Algal toxins breakdown over time; if the affected waterbody isn't used for human consumption or watering stock, one option is to let it run its course!