

Aquatic plants - algae and seagrasses



Aquatic plants (including algae and seagrasses) live and grow in or on water. These plants are a very productive food source for animals, and they provide a shelter for small animals that are the food source of many juvenile fish. They stabilise sediments and help to keep oxygen and nutrient levels in balance. The presence of a great diversity of algae in a river indicates that it is healthy. The growth of algae is affected by water salinity levels, temperatures, light conditions, available nutrients, water movement and the degree of sedimentation.

Microscopic algae (microalgae)

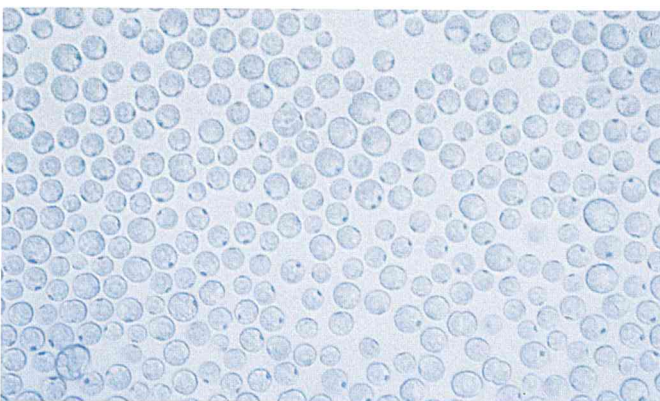
There are three main groups of microscopic algae (according to their habitat requirements). Planktonic algae (phytoplankton) float in the water column, taking the nutrients needed for growth from the water. Epiphytic algae attach to other plants. Benthic microalgae are found in sediments.

The most common species of microscopic algae found in the river are diatoms. They are a type of phytoplankton.

Freshwater species of algae are mostly restricted to the upper estuary, but can be found in the lower estuary in winter. Marine species are confined to the lower estuary,



Spirogyra chlorophyte



Chlamydomonas chlorophyte

except during summer-autumn when they move into the upper estuary as salinities increase.

When conditions such as salinity, temperature, light and nutrient levels are right, microscopic algae can grow extremely fast to create an algal 'bloom'. The river experiences occasional blooms of microscopic algae such as diatoms, dinoflagellates, chlorophytes and cryptophytes. The blooms can appear as fluffy growths on other macroalgae or as brown, red or green colourations in the water. The chlorophyte *Chlamydomonas* blooms in October from the upper reaches of the Swan to Perth Water. A diatom bloom commonly occurs in the lower reaches around Melville Water in the spring, associated with salt water moving up river. Dinoflagellate blooms occur in late summer and autumn in the middle and upper parts of the upper estuary. A diatom, *Melosira moniliformis*, occurs in this area in spring, appearing as a growth on macroalgae or on rocks or jetty piles. Fortunately, while some varieties of microalgae are toxic, most toxic forms will not survive in the estuary's saline waters.

Macroscopic algae (macroalgae)

Over sixty-five species of macroscopic (large) algae have been identified in the Swan River estuary. They either float freely in the water column, grow on other large water plants or are attached to a substrate such as sand, rocks, logs, branches or jetty pylons. Many macroalgae die off in winter due to decreased salinity and increased turbidity. In summer they re-grow from spores. With increasing distance upstream fewer different kinds of macroalgae are found. Many species nearer the estuary mouth are strictly marine in nature. During spring, large accumulations of macroalgae can occur, mainly in the warm shallows of Peppermint Grove and Mosman Bay and along the Canning River foreshores.

Seagrasses

Seagrasses are flowering plants, so they prefer clear water and sand or mud for their root systems. The most common type of seagrass is *Halophila ovalis* (paddle weed), which grows in clear waters up to three metres deep. *Zostera*, another species of seagrass, is restricted to the lower reaches of the Swan River.

Seagrass roots anchor the sediments, stabilising the floor of the estuary and providing a home for molluscs, worms and other invertebrates. Some burrowing fish like estuarine cobbler excavate burrows for laying eggs and brooding. Some fish species use the seagrass meadows as shelter, and feed on the algae and invertebrates found among the leaves. Some fish lay eggs on them. The decaying leaves of seagrass provide a large amount of organic matter for aquatic animals – they are a major food source for a variety of invertebrates.

Cyanobacteria: blue greens

Cyanobacteria, or blue greens, are primitive single-celled organisms that have no cell nucleus and are related to bacteria. The microscopic cells form colonies or threadlike chains (filaments). Like plants, they use light energy for photosynthesis. Blue greens were among the first forms of life on earth. They dominated the earth for millions of years, producing carbohydrates from solar energy and releasing oxygen which made the evolution of higher life

forms possible. Cyanobacteria were responsible for the blooms that have caused costly environmental problems in the eastern states in the Murray-Darling river system. Many of our local wetlands, rivers and estuaries have experienced cyanobacterial blooms.

When they bloom they discolour the water blue-green, khaki, or green. During calm weather, a scum may form on the surface that looks like green or bright blue paint and sometimes like jelly. Several species produce potent toxins that are only dangerous to humans under certain conditions, and this is not fully understood. Potentially toxic blue-green blooms of *Anabaena* and *Microcystis* have been found in the Canning River in 1993 and 1994. A toxic bloom of *Microcystis aeruginosa* occurred in the Swan estuary in February 2000.

Further reading:

Algal blooms, Water facts No 6, Water and Rivers Commission, 1998.



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Nuisance phytoplankton, blue-greens and plant species	Comments
1. <i>Heterosigma</i> phytoplankton	Slimy layer – nuisance warnings and potential to kill fish
2. <i>Scrippsiella</i> , <i>Gyrodinium</i> dinoflagellate phytoplankton	Red tide – nuisance warnings, some adhere to the body
3. <i>Rhizoclonium</i> macroalgae	Unaesthetic appearance and temporary loss of recreational amenity
4. <i>Anabaena</i> blue-green phytoplankton	Blue-green – unsafe for recreation, prevalent in the upper Canning River
5. <i>Microcystis</i> blue-green phytoplankton	Blue-green – unsafe for recreation, prevalent in the upper Canning River
6. <i>Anabaenopsis</i> blue-green phytoplankton	Blue-green – unsafe for recreation, prevalent in the upper Canning River
7. <i>Hydrocotyle</i> plant	Introduced – gazetted noxious plant, occasional outbreaks in the Canning River
8. <i>Salvinia</i> plant	Introduced – gazetted noxious fern-like plant, most common in the Canning River

Common nuisance phytoplankton, blue-greens and plant species found in the Swan-Canning system.