

Lakes and Blooms of algae

Lake Bolac is more than just a basin containing water. In a social sense it is a place of recreation and scenic beauty, and occasionally a water supply in the past. However, in a biological sense, it is habitat for a huge diversity of birds and fish, invertebrates, plants and algae. Most people only see the 'tip of the iceberg' in relation to the living things that occupy the lake: the fish and birds. The rest of the 'iceberg' are the things that fish and birds eat: invertebrates (critters, worms and bugs in the water), and what they eat: plants and algae.

Most of the time the lake is like a well-grazed paddock, with plants and algae growing and being eaten at the same rate at which they grow, so algal growth is never lush, overgrown, rank, or out-of-control. Sometimes things get out of balance and the plants and algae are not grazed at the same rate at which they grow. When algal growth becomes obvious and abundant we call this a 'bloom'.

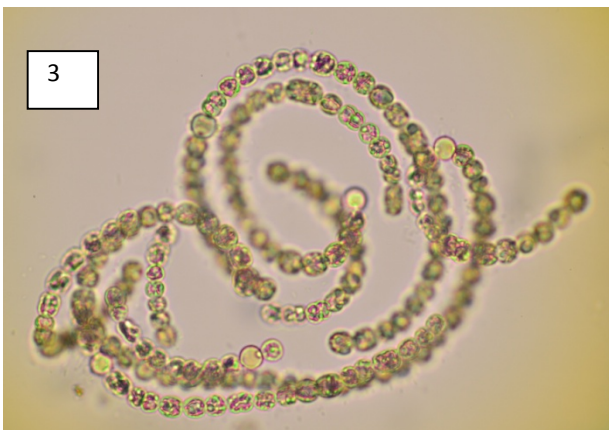
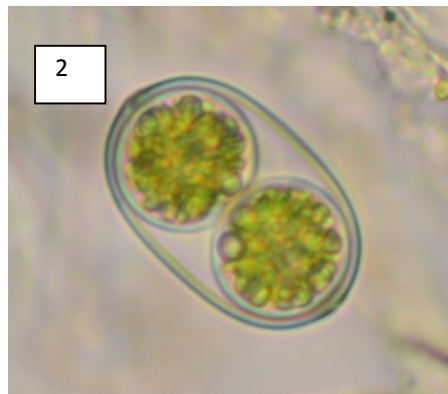
The things that control the rate of algal growth are the availability of nutrients (think of superphosphate and nitrogen on grass), sunlight, warmth, mixing and the number and species of grazers. Nutrient availability is modified by nutrient inputs (coming in from the catchment via the Fiery Creek and via run-off around the edges of the lake), nutrient uptake by plants, and the nutrients stored in the lake sediments.

The amount of light available to algae depends on the clarity (opposite of turbidity) of the water. Warm water temperatures enhance algal growth.

Wind mixes the lake and lifts nutrients from the sediments into the water, but when the water is still it favours the growth of algae that can come to the surface (like blue-green algae).

We are likely to get blooms in Lake Bolac when there are plenty of nutrients, the weather (and water) is warm and still, and blue-green algae are favoured when there is a lot of Phosphorus and less Nitrogen, and the water is somewhat murky or turbid.

Lake Bolac has a huge variety of different algae. There are many different groups of algae, some have glassy cell-walls (the Diatoms Fig. 1), others have flexible cell walls (the Euglenophytes), some are green (Chlorophytes Fig. 2), some are golden-brown (the Chrysophytes and Dinoflagellates), and some are blue-green (the Cyanobacteria Fig. 3).



Different animals eat them: blood-worms (that grow up into midges), copepods (tiny relatives of prawns), protozoa (single-celled animals Fig. 4). Fish and birds eat the animals that eat the algae.

Plants growing around the edge, and in the water provide hiding places for the animals. They also provide a physical filter between the land and water, and plants can absorb nutrients from the water and sediment too.