MICRO-ORGANISMS (mostly!)

SCUMBOOK!

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scum (skm)
n.
1. A layer of dirt, froth, or impurities etc. forming at the top of liquid, esp. in boiling or fermentation
2. (foll. by of) the most worthless part of something
3. (colloq.) a worthless person or group

Scum doesn't have very nice connotations according to the Australian Concise Oxford Dictionary (1997) definition. In general, that is the reaction people have when you mention a scum formed by algae and aquatic plants in our waterways. People think of smelly, decomposing stuff in a swamp, fish deaths, creatures from the black lagoon... but do scums really deserve this bad press?

Scums and algal blooms are certainly hot topics at the moment with a number of toxic algal blooms in the Swan River dominated by the dinoflagellate, *Karlodinium micrum*, resulting in odours and fish deaths. Blooms like this get lots of media coverage which reinforces the common perception that scums are bad. Alas, many people see scums or any prolific growth of algae or aquatic plants as undesirable - a problem to be removed.

Many of the blooms that we perceive as problems are harmless native species that have undergone prolific growth through the introduction of excess nutrients e.g. fertilisers from agricultural properties or suburban gardens. In fact, only a few algae such as *Karlodinium*, pose a serious health risk. Dinoflagellates, the group to which *Karlodinium* belongs, are a diverse and fascinating group. Species range from harmless, unicellular algae that swim around using little flagella that whip through the water and fuel a healthy food chain, to those that are able to produce light known as bioluminescence, to others that produce saxitoxin, a neurotoxin 100,000 times more potent than cocaine. In this case it is vital to know which species – literally the difference between life and death.

Spirogyra bloom at Swan Lake, Bayswater. A natural bloom - *Spirogyra* rarely causes problems although at this site the bloom has probably been promoted by extra nutrients from suburban gardens. Photo: Wassele Hosja.

Myriophyllum, an angiosperm (flowering plant) and *Chara*, an alga. Photo: Suzi Wild.

Most algae and aquatic plants inhabit their natural environment and exhibit a normal cycle of growth and decay, sometimes forming "blooms" in spring and summer. The algae and plants form an integral part of the wetland or estuarine ecology and provide vital functions to the ecosystem. For example, they provide a food source, habitat and nursery for animals, stabilise and aerate sediments, trap particles, and filter nutrients and pollutants from the water.

The diversity of plant life in wetlands and estuaries is profuse. It includes tiny singular cells that to the naked eye only serve to colour the water, slightly larger filaments that might float as a scum on the water, large forms that are readily identifiable as filamentous algae, and more typical plants with stems, leaves and roots. These plants often grow together in communities, disguising their individual forms.

Sometimes the difference between algae and aquatic plants is not so clear. Consider the alga *Chara* and the angiosperm *Myriophyllum*, both have a long stem with whorls of "leaves" at intervals along the stem, looking something liked an elongated bottlebrush. But *Chara*

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is an algae and doesn't really have any leaves at all – it just looks like it has leaves. This is a case of convergent evolution, where the best design for survival has been achieved by two very different types of plants, such that they look similar! Charophytes are thought to be an evolutionary link to the development of higher plants. They are very beneficial to wetlands filtering the water, so where charophytes occur the water is often crystal clear.

So how is the average person visiting a lake or river to know whether the waterway is healthy or toxic?

Scumbook! is a new book developed by the Department of Environment, the Swan River Trust, Murdoch University and the Water Corporation of Western Australia to help people do just that. Often identification books are very technical requiring some knowledge of botany. Scumbook! is designed to help people without any previous knowledge, identify plants and algae and distinguish them from other substances in a wetland or estuary. The book is set out in four sections (Aquatic Plants, Macroalgae, Scums and Water Colour) which can be rapidly accessed by a simple key at the beginning of the book. The "Stick Test" requires the reader to pull the plant, algae or substance out of the wetland with a stick (no getting wet or touching toxic substances) and by comparing its appearance on the stick with photographs, the reader is directed to one of the four sections. A further key at the beginning of each section enables identification of the plant. Bright symbols on the photographic page (eg Toxic: skull and crossbones) indicate whether the plant is harmful or healthy, and what role it plays in the ecology of the wetland. The book is restricted to plants found in the open water, not weeds and emergent plants in the fringing vegetation, but it also includes common substances in the water (eg tannin, iron bacteria, oil films, foam).

Scumbook! provides a user-friendly resource for practitioners in the aquatic environment and the wider community, and aims to promote a better understanding of the diversity of algae and aquatic plants and the role that they play in the natural ecology of our waterways.

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Scumbook! costs $30.00 and is available from Murdoch University bookshop (ph: (08) 9360 2540).