Encyclopedia of Earth

Aquatic plants

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Article Topics: **Botany, Algae, Limnology *and* Marine ecology**
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Last Updated: August 28, 2008

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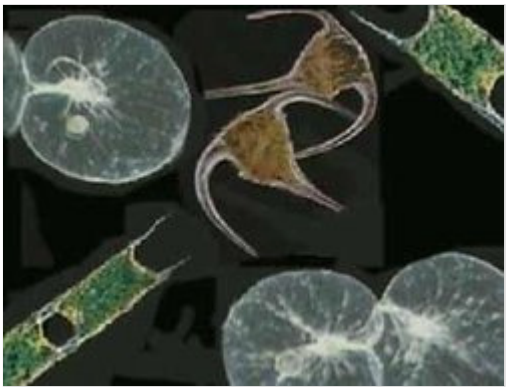
Introduction

Aquatic plants grow in shallow to deep water zones. The three main types of aquatic plants are (1) single-celled phytoplankton, (2) periphyton (algae growing attached to substrates) and (3) multicellular macrophytes. Phytoplankton includes several groups of algae (e.g., green algae, golden brown algae, euglenophytes, dinoflagelates, and diatoms) and one group of photosynthetic bacteria (Cyanobacteria). Planktonic algae may be either benthic (attached to a substrate) or planktonic (floating in the water column). There are large numbers of phytoplankton (> 400 species) in many bodies of freshwater; phytoplankton are most common in habitats with high nutrient levels.



Phytoplankton. (Source: NASA Earth Science Gallery)

Periphyton. (Source: USGS)

Periphyton may grow attached to other plants (ephytic periphyton) or on rocks and other substrate (epibenthic periphyton). Typically, periphyton is made up of a diatoms, a variety of filamentous algae (including *Spirogyra*, *Anabanea*, *Oscillatoria*, *Lyngbya*, *Pithophora* spp), and cyanobacteria. The abundance or pheriphyton also increases with increase in nutrient content. Periphyton can be an important source of food for herbivores.

Aquatic multicellular macrophytes include macroalgae (the green algae in the family Characeae), non-vascular plants (e.g., mosses), or vascular plants (the flowering plants). Aquatic macrophytes may be classified as emergent (e.g., cattails), free-floating (e.g. water lilies), or submerged macrophytes.

Characteristics of Aquatic Vascular Plants

Differences between terrestrial and aquatic habitats lead to big differences in the characteristics of aquatic and terrestrial vascular plants. The high density of water makes aquatic organisms more buoyant, so aquatic plants invest less resources in support tissues than terrestrial plants. Because aquatic plants are surrounded by water, water loss is not a problem. Thus, submerged plants lack the structural and protective structures produced by terrestrial plants. For example, submerged aquatic plants lack a well develop waxy cuticle layer to prevent desiccation. Because submerged plants are capable absorbing water, nutrients, and dissolved gases directly through their leaves, xylem (the part of the plant responsible for carrying water and nutrients from the roots to the leaves) is reduced or absent. Leaves of submerged aquatic vegetation lack stomata, the pores in the leaves through which terrestrial plants exchange gases such as carbon dioxide and water vapor with the environment. In terrestrial plants roots play an important role in the absorption of water and nutrients. Roots are often reduced (or lacking) in submerged aquatic vegetation and their only function is to anchor the plant to the ground.

Aquatic macrophytes. (Source: Minnesota Pollution Control Agency)

Further Reading

- Canada's Aquatic Environments

Citation

McGinley, Mark (Lead Author); Harold Ornes (Contributing Author); Daniel Robert Taub (Topic Editor). 2008. "Aquatic plants." In: Encyclopedia of Earth. Eds. Cutler J. Cleveland (Washington, D.C.: Environmental Information Coalition, National Council for Science and the Environment). [First published in the Encyclopedia of Earth February 26, 2007; Last revised August 28, 2008; Retrieved February 10, 2009]. <http://www.eoearth.org/article/Aquatic_plants>

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