Phytoplankton Encyclopedia Article

Phytoplankton

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Phytoplankton

Phytoplankton are microscopic, photosynthetic organisms that float in the water of the oceans and bodies of freshwater (the word phytoplankton is derived from the Greek for "drifting plants"). The most abundant organisms occurring within the phytoplankton are algae and blue-green bacteria, but this group also includes certain kinds of protists (especially protozoans) that contain symbiotic algae or bacteria.

Phytoplankton are responsible for virtually all of the primary production occurring in the oceans. Marine phytoplankton range in size from extremely small blue-green bacteria, to larger (but still microscopic) unicellular and colonial algae. Oceanic phytoplankton are grazed by tiny animals known as zooplankton (most of which are crustaceans). These are eaten in turn by larger zooplankton and small fish, which are fed upon by larger fish and baleen whales. Large predators such as bluefin tuna, sharks, squid, and toothed whales are at the top of the marine food web. Marine phytoplankton are much more productive near the shores of continents, and particularly in zones where there are persistent upwellings of deeper water. These areas have a much better nutrient supply, and this stimulates a much greater productivity of phytoplankton than occurs in the open ocean. In turn, these relatively fertile regions support a higher productivity of animals. This is why the world's most important marine fisheries are supported by the continental shelves (such as the Grand Banks and other shallow waters of northeastern North America, near-shore waters of western North and South America, and the Gulf of Mexico) and regions with persistent upwellings (such as those off the coast of Peru and elsewhere off western South America, and extensive regions of the Antarctic Ocean).

Some inland waterbodies occur in inherently fertile watersheds, and are naturally eutrophic, meaning they have a high productivity and biomass of phytoplankton (in shallow waters, larger aquatic plants may also be highly productive). So-called "cultural eutrophication" is a kind of pollution caused by nutrient inputs associated with human activities, such as the dumping of sewage waste and the runoff of fertilizer from agricultural land. Both fresh and marine waters can become eutrophic through increases in their nutrient supply, although the problem is more usually severe in freshwaters. The most conspicuous symptom of eutrophication is a large increase in the biomass of phytoplankton, which in extreme cases is known as an algal "bloom."