Paeophyta Encyclopedia Article

Paeophyta

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Paeophyta

Also known as brown algae, Paeophyta (or Phaeophyta) are photosynthetic **protists**, belonging to the Chromista Kingdom (i.e., "with color"), a kingdom closely related neither to plants nor to other algae. This kingdom includes microscopic life forms such as **diatoms**, colorless mildews, giant kelps, and sargassum. Most Chromista are photosynthetic, including Paeophyta, but they also make other pigments not found in plants, including a modified **chlorophyll** with a different molecular shape from that synthesized by plants. Paeophytes also make high levels of carotenoids, in special fucoxanthin, which give them their golden and brown colors. Unlike plants, they do not store energy as glucose and starch, but as laminarin, a polymer formed by glucose and a six-carbon sugar alkaloid termed mannitol. Most paeophytes reproduce through sexual alternation of generations, with some species presenting a dominant diploid phase (such as kelps) and others isomorphic phases (i.e., each generation being very similar to each other).

Paeophyta comprises several genera, including the largest species among the Chromista, although many species are microscopic brown algae, which grow on underwater rock or coral surfaces, or on vegetation, forming encrustations or filamentous networks, such as those commonly found in and around underwater giant kelp forests. Giant kelps form dense sea forests such as those found in the tidepools nearby Monterrey, California, with long and strong stalks up to 50-60 meters (197 feet) high, fixed at the sea bottom through brushy holdfasts. From the stalks grow flat blades termed lamina that capture sunlight and make **photosynthesis**. Some **kelp** have flotation bladders that sustain their photosynthetic blades near the water surface, for better exposition to solar energy. Paeophytes grow in coastal marine cold and temperate water, with a few species growing in freshwaters as well. Many are intertidal species, and are exposed to open air during low tide, such as Fucus (rockweed). Some Paeophytes, such as *Sargassum natans* and *Sargassum fluitans* are pelagic species (i.e., free-floating species), due to their gas-filled vesicles. They form floating ecosystems in the western North Atlantic sea that support more than 50 different species of fish and several species of crabs, as well as invertebrates, such as gastropods, polychaetes, anemones, sea-spiders, etc.