Pyrrophyta Encyclopedia Article

Pyrrophyta

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Pyrrophyta

Approximately 2000 species of Pyrrophyta (from the Greek *pyrrhos,* meaning flames, and *phyton,* meaning plant) are known at present. Pyrrophyta have been identified in fossil deposits around the globe, from arctic to tropical seas, as well as in hypersaline waters, freshwater, and river deltas. Pyrrophyta are mostly unicellular microorganic **Protists** divided by botanists in two phyla, **dinoflagellates** and criptomonads.

The taxonomic classification of Pyrrophyta is disputed by some zoologists who consider them members of the **Protozoa** kingdom. Cryptomonads for instance, are considered red-brownish algae of Cryptomonadida Order by botanists, and protozoans of Cryptophycea Class by zoologists. This controversy is due to the unusual characteristics of these two phyla, sharing features with both plants and animals. For instance, most species swim freely because of the spiraling agitation of two flagella, and have multiple cell walls with two valves. Some Pyrrophyta are photosynthetic species, however, whereas others are not. They come in a variety of shapes and sizes and the photosynthetic species have golden-brown or yellowish-green chloroplasts. They can synthesize both types of **chlorophyll**, type a and type c, and contain high levels of carotenoids (yellow pigments). Some Pyrrophyta, such as *Gymnodium* and *Gonyaulax* are dinoflagellates responsible for red tides and secrete neurotoxins that cause massive fish death. If these toxins are airborne in a closed room, or if they get in contact with the skin, they may contaminate humans and cause temporary or more severe neurological disorders. Some species such as the *Ceratium* can deplete water from oxygen, also leading to massive fish death, a phenomenon known as black tide.

Photosynthetic Pyrrophyta are autotrophs, whereas the non-photosynthetic ones may be heterotrophs, existing as **parasites** in fish and aquatic invertebrates as well. Some autothrophic species also feed on other dinoflagellates and unicellular organisms, by engulfing them. Symbiotic species (zooxanthellae) are also known, which live in sponges, jellyfish, anemones, growing coral reefs, etc, where they supply carbon to their hosts. Cryptomonads themselves are the evolutionary result of endosymbiosis, and are chimeric species that evolved from ancestral red algae and a non-photosynthetic host that retained the red alga **nucleus** under the form of a bead-like nucleomorph chromosome. The highly condensed chromosome of this Pyrrophyta consists of three different bead-like nucleomorphic units.