Abstract

Due to natural processes and human activity extremely acidic habitats, whose pH does not exceed 3.0, are formed on Earth. These are especially areas affected by the acid mine drainage (AMD) and of volcanic activity. The biodiversity of these habitats is greatly reduced, but there are microorganisms that are very well adapted to such extreme conditions. These organisms are termed as acidophilic.

Cyanobacteria and algae are the only primary producers at extremely acidic sites and thus play a crucial role in these ecosystems. Although they must overcome several problems that are associated with such an environment (excess of H^+ ions, increased concentrations of heavy metals), they developed a range of ecophysiological adaptations and life strategies that allow them to inhabit it. These are mainly the ultrastructural changes in the cell membranes, special metabolic processes and the production of special substances and enzymes.

Acidophilic species are present across almost all taxonomic groups of cyanobacteria and algae.

Interest in acidophilic organisms has increased in recent decades due to their potential use in biotechnology. Knowledge of their taxonomy, ecology and ecophysiology can also be used in paleobiology and exobiology.