

Life under extreme conditions

P. Schönheit

Institut für Allgemeine Mikrobiologie, Christian-Albrechts-Universität Kiel, Germany

Life on our planet comprises a large variety of organisms ranging from unicellular prokaryotic microorganisms to complex multicellular eukaryotes, such as plants, animals and men. Today, most organisms are adapted to moderate physicochemical environmental conditions, such as temperatures between 10-40°C, pH values of 6-8 and low salinity (<0.2 M NaCl). Recently, many microorganisms have been isolated from “extreme” environments, which were once thought to be devoid of life. These extremophilic microbes grow e.g. at temperatures up to 120°C, at acidic pH (pH 0-2) or at high salinity (up to 5 M NaCl). This talk will mainly focus on hyperthermophiles, their habitats and adaptation of cellular components to heat. The metabolism and phylogeny will be discussed. It is assumed that hyperthermophiles represent the most ancestral living organisms, and that life likely originated under hyperthermophilic conditions in the absence of light and oxygen, with geochemically formed compounds, such as H₂, CO₂ and S, as nutrients. These conditions are assumed to be similar to those of the early earth.