

Extremophiles and Biomolecules: Some Aspects and Prospects

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ABSTRACT

Extremophilic habitats are such wherein extreme conditions prevail and, in such habitats, human life becomes difficult. Such habitats include hot springs, hydrothermal vents, deep oceans, deserts, high altitude environments, brines, sodic lakes, nuclear reactors, ice sheets, toxic wastes, compost and other such habitats. Life forms exist in such habitats include Archaea, Bacteria, Eukaryotes, and others. Living organisms that colonize extremophilic habitats are classified as Thermophiles, Psychrophiles, Acidophiles, Alkaliphiles, Barophiles, Xerophiles, Halophiles, and others. The organisms that grow in such extreme habitats are called super bugs. Many such bacteria and Archaea include the species *Thermus*, *Thermococcus*, *Pyrolobus*, *Pyrococcus*, *Methanobacterium*, *Bacillus*, *Clostridium*, *Hortaea*, *Acidomyces*, and many others. Fungi living in such extreme habitats include the species of *Aspergillus*, *Emericellopsis*, *Exophilea*, *Saccharomyces*, *Wallemia*, *Rhodotorula*, *Markia*, *Chaetomium*, *Xeromyces* and others. The above mentioned examples of microbes and fungi are such examples that get evolved and survived under hostile conditions, hence named as extremophiles. Extremophiles are considered as a chemical factory and are the interesting source for innovative industrial and biotechnological products due to their ability to produce several kinds of biomolecules that have prospective application in industry, agriculture, nutrition, pharmaceuticals and many others. The biomolecules include enzymes, polyketides, peptides, alkaloids, lipids, polysaccharides and others which are employed in several processes and applications besides forming an excellent source of new catalysts. Unfortunately, less than 1% of extremophilic microbes and fungi have been cultivated in culture under laboratory conditions.

Keywords: Alkaloids, Archaea, Bacteria, Biomolecules, Catalyst, Enzymes, Extremophiles, Fungi, Industry

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