

Extremophiles as a Source of Important Bioactive Molecule: Extremolytes

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ABSTRACT

Extremophiles are organisms that are able to survive in very extreme environment. Extremophiles are an important source of bioactive molecules such as extremozymes, extremolytes and other metabolites. Extremolytes are one of the high value bioactive molecule that has high economic industrial potential. Extremolytes are small, low molecular weight organic molecules. They accumulated within cells during stressful conditions such as high salinity, high temperature, high radiation and other extreme conditions. They are accumulated in a cell upto 25% of a dry weight of a cell. Extremolytes includes some polyol compounds such as ectoine and hydroxyectoine, carbohydrates, heterosides, amino acids and their derivatives. They are known as protective molecules. They protect cells and biomolecules from any damage caused by extreme conditions. They stabilize macromolecules by forming a layer of water for protection. Many health care products such as mouth, nasal and throat spray, eye drops and salve, as well as some commercial cosmetics possess ectoine and/or glycoin as an active ingredient. Ectoine is useful in skin care and protein free stabilizer. Extremolytes from Radiophiles have role in protection against UV radiations. Therefore, they are used in cosmetic and pharmaceutical industries. Extremolytes have also important role in alleviating neurodegenerative and aging related disorders. Several extremolytes are used in new formulations to increase the stability of viral vectors. Many more extremophiles await exploration, and thus there are likely even more new types of extremolytes to be found that could be used in cosmetics and for various medical purposes.

Keywords: Extremolytes, Polyols, Cosmetics, Pharmaceuticals

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