

THE POTENTIAL OF BIOPROSPECTING FOR NOVEL EXTREMOPHILES FROM KENYAN ECOSYSTEMS

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Abstract

Extreme environments provide microorganisms containing robust enzymes. Such microorganisms that flourish in extremes of temperature, pressure, acidity or alkalinity are sources of extremophilic enzymes that are required by many industrial processes. Bioprospecting for such enzymes involves culturing and isolation of novel extremophiles from these habitats. Kenya is highly endowed with diverse ecosystems. Some of the ecosystems that could be sources of extremophiles are the Gregorian Rift valley biogeographical lakes. These lakes exhibit distinctive physiochemical properties such as acidic and alkaline conditions. Such Lakes include; L. Nakuru, L. Bogoria, L. Magadi which are alkaline lakes. These habitats could be rich sources of alkalophilic enzymes. Whereas Olkaria hot vents and the Lake Bogoria geysers, hot springs and Vents could be potential sources of thermophilic and sulfurous thermoacidophilic enzymes. On the other hand, Mt Kenya, which is the second highest mountain in Africa and among the uniquely snow-capped mountain on the equator, may be a potential source for psychrophilic enzymes. Such enzymes could withstand thawing and freezing temperatures, a phenomenon exhibited in these habitats. This is can be an ideal characteristic for some industrial enzymes. This paper outlines the various aspects of bioprospecting and the need for exploration of novel extremophilic enzymes in selected Kenyan habitats. It also discusses the potential of such habitats as rich sources of these enzymes. Finally, the benefits and the dangers of such expeditions are outlined.