Unlocking the Power of Extremophiles: A Strategy to Eliminate Pollutants Applying Bioremediation

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ABSTRACT

Extremophiles are microorganisms that can survive and adopt to harsh environment with a variety of environmental conditions including extremes in temperature, salinity, nutrition supply and pressure. They are highly suited for use in bioremediation applications because they produce a wide variety of enzymes that can break down complex organic molecules and are functional even in extreme environmental conditions. The usage of extremophilic microorganisms and their metabolic pathways has been the focus of scientific efforts to improve the conversion of biomass into different chemical compounds and to develop biomonitoring and bioremediation strategies to combat environmental pollution. For example extremozyme laccase from Marinobacter hydrocarbonoclasticus has been successfully used in hydrocarbons bioremediation. There is an urgent need to creat efficient treatment methods due to growing concerns about the significant impact of numerous hazardous toxic contaminants on the environment and public health. Anthropogenic activity induced contaminants of soils, sediments and water is a matter of global concern. The current paper emphasized the importance of these micro-organisms in contributing to a sustainable future by enhancing the degradation of pollutants such as hydrocarbons, heavy metals and industrial waste in areas with extreme temperatures, acidic or alkaline conditions and high salinity.

Keywords: Extrmophiles, Toxic contaminants, Environment, Pollutants bioremediation, Metabolic pathway.

How to Cite

Beenu Solanki, Shikha Mandloi, Deepti Sankat, “Unlocking the Power of Extremophiles: A Strategy to Eliminate Pollutants Applying Bioremediation”, *AIJR Abstracts*, p. 44, Mar. 2025.

DOI: 10.21467/abstracts.177 ISBN: 978-81-984081-3-6 (eBook), 978-81-984081-9-8 (Paperback)