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# Trends in Biotechnology of Polyextremophiles

# Potentiality of Polyextremophilic Organisms in Bioremediation of Aromatic Hydrocarbons and Persistent Organic Pollutants: A Biotechnological Approach



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**Abstract** Polyextremophiles are organisms that have adapted themselves to survive within habitats having different physicochemical conditions at extreme levels. They live in particular growing conditions that reduce contamination as well as competition among other microorganisms. Various strategies have been tailored by them to strive in the stressful environment and low nutrient conditions. These organisms are especially capable of uptaking various persistent organic substances as a source of carbon and energy, even with their less availability because of their hydrophobic nature. A number of extracellular enzymes such as peroxidase, laccase, cellulase, xylanase, pectinase, and protease are synthesized by these organisms, which biodegrade/biotransform petroleum and other aromatic hydrocarbons, persistent organic substances, and other xenobiotic compounds. The low functional specificity and efficient redox activity of peroxidase, laccase, and other enzymatic machineries enable the oxidation of various aromatic hydrocarbons and other persistent organic pollutants. The whole-cell polyextremophilic organisms, their extremozymes,

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