

Isolation and Molecular Identification of Phenol Tolerating Bacteria from Petroleum Contaminated Sites

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Abstract : Context: This research was conducted to isolate and identify phenol-tolerant bacteria from petroleum-contaminated sites in the northwestern part of Nigeria. Research Aim: The aim of this study was to identify bacteria with the ability to tolerate different phenol concentrations. Methodology: Samples were obtained from different petroleum-contaminated sites, and bacteria were cultured, followed by morphological, microscopic, and molecular identification. Isolates were grown on phenol-tolerant nutrient agar. The tolerant ability of the isolates was observed at 500 mg/L, 1000 mg/L, and 1500 mg/L concentrations of phenol. Findings: Two bacteria species (NWPk and NWPkD) were obtained. The total viable counts of phenol-utilizing bacteria from NWPk and NWPkD were 2.71×10^7 and 4.0×10^6 cfu/g, respectively. The NWPk showed its capacity to tolerate phenol at 2.3×10^7 , 2.5×10^7 , and 1.0×10^7 cfu/g of 500, 1000, and 1500 mg/L of phenol concentration, respectively, while NWPkD tolerance ability was 1.5×10^7 , 3.8×10^7 and 1.0×10^7 cfu/g of 500, 1000 and 1500 mg/L of phenol respectively. The isolates were identified as Citrobacter and Acinetobacter species, respectively, based on 16S rRNA gene sequence analysis. Conclusion: The study found that these isolates showed the ability to withstand and survive high phenol concentrations in the environment.

Keywords : phenol tolerance, bacteria, petroleum contaminated sites, 16S rRNA

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