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Bioremediation Potentials of Some Indigenous Microorganisms Isolated from Auto Mechanic Workshops on Irrigation Water Used in Lokoja Kogi State of Nigeria

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Abstract : Three (3) indigenous bacteria species (Bacillus spp, Acinectobacter spp and Moraxella spp) previously isolated from contaminated soil of some auto mechanic workshops were used for bioremediation studies on some irrigation water used at Sarkin-noma Fadama farms located in Lokoja Kogi State, Nigeria. This was done in order to investigate their bioremediation potentials using a simple pour plate method. The physicochemical parameters and heavy metal analysis (using AAS iCE 3000) of the irrigation water were performed before and after inoculation of the isolated organisms. Nitrate and phosphate concentration were found to be 10.56mg/L and 12.63mg/L prior to inoculation while iron and zinc were 0.9569mg/L and 0.2245mg/L respectively. Other physicochemical parameters were also observed to be high prior to inoculation. After the bioremediation test (inoculation with the isolated organisms), a nitrate and phosphate content of 2.53mg/L and 2.61mg/L were recorded respectively, iron and zinc gave 0.1694mg/L and 0.0174mg/L concentrations while other physicochemical parameters measured were also found to be lower in their respective values. The implication of this present study is that a number of carefully isolated indigenous bacteria species are capable of reducing the amount of heavy metal concentrations in water. Also, non-metallic contaminants like nitrate and phosphate are susceptible to bioremediation in the presence of such efficient system.

Keywords : bioremediation, heavy metals, physicochemical parameters, Bacillus spp, Acinectobacter spp and Moraxella spp, AAS, spectrometer 3000
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