



Remediation of Pb-Resistant Bacteria to Pb Polluted Soil

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ABSTRACT

To show the remediation of Pb-resistant bacteria to Pb polluted soil, several indices including microbial counts, soil enzyme activity, microbial community diversity and soil Pb concentration were investigated. Two Pb-resistant bacteria were filtrated and identified by previous study as *Bacillus pumilus* and *Pseudomonas aeruginosa* (GeneBank Accession No. FJ402988 and GU017676) and inoculated to soil planted with cabbages. Soil with different Pb application rates were incubated for a period of 0, 12, 24, 36, 48 days in greenhouse. Results indicated the count of bacteria in 1000 mg/kg Pb treated soil greatly affected by inoculating Pb-resistant bacteria, which was raised about 237% and 347% compared with control. Soil urease and invertase were intensified 37.9% and 65.6% after inoculation compared with control. Phosphatase activity was inhibited by inoculation of *Bacillus pumilus*. Catalase activity was intensified about 64.2% in 24 days incubation but decrease in the following days. Microbial community diversity analyzed by polymerase chain reaction-denaturing gradient gel electrophoresis (PCR-DGGE) also proved that the samples inoculated with Pb-resistant bacteria exhibited more bands and intensity in DGGE patterns compared with uninoculated ones. For Pb-resistant bacteria inoculated samples, the reduction of Pb concentration in rhizospheric soil was 15 mg/kg at least and 42 mg/kg at most, and *Pseudomonas aeruginosa* showed a better tolerance to high Pb concentration and stronger remediation ability. It was concluded that remediation of Pb polluted soil can be promoted by the two Pb-resistant bacteria.

KEYWORDS

Pb Pollution, Pb-Resistant Bacteria, Microbial Community Diversity, PCR-DGGE, Enzyme Activity

Cite this paper

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