Exported Abstract record(s)

Elucidation of impact of heavy metal pollution on soil bacterial growth and extracellular polymeric substances flexibility. Muniswamy David; Krishna, P. M.; Jeybalan Sangeetha ; Springer Berlin , Heidelberg , Germany , 3 Biotech , 2016 , Vol. 6 , No. 2 , pp. 172

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Metal bioaccessibility is an alarming issue in croplands of mining sites due to overloading of toxic metals. Hence, the present study is aimed to determine the overloading of toxic metal in croplands across the Tawag village, Hutti, Raichur, India. Correspondingly, to identify the soil bacterial growth, physiological oxidative stress enzyme activity and surface macromolecular functional group evolution were analysed in and around the toxic metal contaminated sites through FT-IR and FT-Raman spectrometry. The evaluated results attribute that the study area is heavily polluted with the toxic metals such as arsenic, cadmium, chromium, lead and zinc. However, biochemical and 16S rRNA gene sequence homology tree confirmed that the arsenic and cadmium-resistant isolate belongs to *Bacillus* sp. MDPMK-02 and retrieved unique Gene Bank ID KT596811 (accession number) at National Centre for Biotechnology information (NCBI), India. Additionally, sodium arsenite-amended culture media possessing reduced biomass and enhanced the activity of oxidative stress defence enzymes such as superoxide dismutase (SOD) and catalase (CAT) than cadmium chloride-amended medium and control. Subsequently, the infrared (IR) and Raman spectral analytical assessment distinguish that arsenic-treated Gram-positive isolate membrane fetched high percentage of hydration, elevation of surface polysaccharides, proteins and polyhydroxybutyric acid (PHBA) molecular specific stretch intensity compared to cadmium exposures. From these results, the study concluded that the mining wastes significantly pollute the surrounding croplands, and also *Bacillus* sp. MDPMK-02 possesses good chemosensing for cross-protection and bio-adaptation of toxic metal ions. Hence, these isolates can be compiled and implemented in environmental hazardous management techniques such as bioremediation, bioleaching and biodegradation.