

Characterization of 2,4,6-Trinitrotoluene (Tnt)-Metabolizing *Bacillus Cereus* Sp TUHP2 Isolated from TNT-Polluted Soils in the Vellore District, Tamilnadu, India

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Abstract : Objective: The main objective was to evaluate the degradative properties of *Bacillus cereus* sp TUHP2 isolated from TNT-Polluted soils in the Vellore District, Tamil Nadu, India. Methods: Among the 3 bacterial genera isolated from different soil samples, one potent TNT degrading strain *Bacillus cereus* sp TUHP2 was identified. The morphological, physiological and the biochemical properties of the strain *Bacillus cereus* sp TUHP2 was confirmed by conventional methods and genotypic characterization was carried out using 16S r-DNA partial gene amplification and sequencing. The broken down by products of DNT in the extract was determined by Gas Chromatogram- Mass spectrometry (GC-MS). Supernatant samples from the broth studied at 24 h interval were analyzed by HPLC analysis and the effect on various nutritional and environmental factors were analysed and optimized for the isolate. Results: Out of three isolates one strain TUHP2 were found to have potent efficiency to degrade TNT and revealed the genus *Bacillus*. 16S rDNA gene sequence analysis showed highest homology (98%) with *Bacillus cereus* and was assigned as *Bacillus cereus* sp TUHP2. Based on the energy of the predicted models, the secondary structure predicted by MFE showed the more stable structure with a minimum energy. Products of TNT Transformation showed colour change in the medium during cultivation. TNT derivatives such as 2HADNT and 4HADNT were detected by HPLC chromatogram and 2ADNT, 4ADNT by GC/MS analysis. Conclusion: Hence this study presents the clear evidence for the biodegradation process of TNT by strain *Bacillus cereus* sp TUHP2.

Keywords : bioremediation, biodegradation, biotransformation, sequencing

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