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Biotransformation patterns of 2,4,6-trinitrotoluene by aerobic bacteria

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Abstract

2,4,6-Trinitrotoluene (TNT), a toxic nitroaromatic explosive, accumulates in the environment, making necessary the remediation of contaminated areas and unused materials. Although bioremediation has been utilized to detoxify TNT, the metabolic process involved in the metabolism of TNT have proven to be complex. The three aerobic bacterial strains reported here (*Pseudomonas aeruginosa*, *Bacillus* sp., and *Staphylococcus* sp.) differ in their ability to biotransform TNT and in their growth characteristics in the presence of TNT. In addition, enzymatic activities have been identified that differ in the reduction of nitro groups, cofactor preferences, and the ability to eliminate-NO₂ from the ring. The *Bacillus* sp. has the most diverse bioremediation potential owing to its growth in the presence of TNT, high level of reductive ability, and capability of removing-NO₂ from the nitroaromatic ring.

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