

Nanochemistry and Nanobiotechnology.

Fungal Degradation of 2,4,6-Trinitrotoluene (TNT)

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Nitroaromatic, polycyclic and polychlorinated compounds of dibenzo-dioxin group are characterized by special toxicity among organic toxicants [1].

The goal of the performed works was selection of highly active cultures capable of assimilating organic toxicants among microscopic fungi and their application for remediation of soils contaminated with TNT. Strains-destroyers of 2,4,6-TNT have been revealed as a result of screening collection strains of microscopic fungi isolated from the territories adjacent to the military grounds of Georgia and industrial waste water.

In order to establish the mechanism of TNT conversion, the products of (1-¹⁴C)- TNT bioconversion by microscopic fungi – *Mucor* sp. T1-1, *Trichoderma* sp. N2-6 and *Aspergillus niger* N2-2 have been studied. It has been established that the carbon carcass of TNT utilized by mentioned strains undergoes biotransformation. Radioactive fractions of organic acids and partially aminoacids have been isolated from culture liquid.. Radioactive fraction of organic acids (70-90%) and partially aminoacids (10-30%) have been isolated from culture liquid. Carbon atoms of 1-¹⁴C-TNT utilized and converted by microscopic fungi mainly participate in synthesis of organic acids. Radioactive label of 1-¹⁴C-TNT is mostly found in fumaric acid. It is known that fumaric acid is one of the products of biotransformation of benzene and is easily converted into succinic acid.

As a result of obtained data analysis it might be concluded that TNT is completely neutralized under the action of microscopic fungi and atoms of this toxic compound are involved in metabolic process of these microorganisms [2].

1. Yateem A., Balba M. T., Al-Awadhi H, El-Nawawy A. S. White-rot fungi and their role in remediating oil-contaminated soil. // Environment Int -1998.- 24.-p.181-187
2. Samkeun Lee, Sun-Young Lee and Kwang-Soo Shin. Biodegradation of 2,4,6-Trinitrotoluene by White-Rot Fungus.// Mycobiology. Mar 2009; 37(1): 17–20