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Transformation of 2,4,6-trinitrotoluene into toxic hydroxylamino derivatives by Lactobacilli

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Abstract

Lactobacilli isolated from different ecological niches were capable of partial nitroreduction of 2,4,6-trinitrotoluene (TNT) to hydroxylaminodinitrotoluenes (HADNT) at a high rate (up to 9.3 nmol/(min mg dry biomass)). For the most active (with respect to the reaction rate) strains, Lactobacillus fermentum BS3601 and Lactobacillus plantarum BS3604, the extent of transformation comprised 95-97%. An inverse correlation was found between the ability to transform TNT and the resistance of bacteria to its toxic action. The inhibitory effects of TNT and HADNT on the activities of glucose-6-phosphate dehydrogenase (G-6-PDH) and glyceral-dehyd--3-phosphate dehydrogenase (GAPDH) in cell extracts of lactobacilli were revealed. © 1999 MAHK "Hayka/Interperiodica".

Keywords

2,4,6-trinitrotoluene, Biotransformation, Lactobacilli, Toxicity