RHODOCoccus AND ARTHROBacter STRAINS - NEW BACTERIAL DESTRUCTOR OF PYRIDINE AND ALKYLPYRIDINES

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Background: A new strains degrading pyridine and alkylpyridines was isolated from the soil contaminated by pyridine containing wastes. It has been suggested to identify the intermediate products of the biodegradation process and propose degradation schemes.

Objectives:
1. Recovery strains from soils
2. Characterization of microorganisms
3. Identification of intermediates

Methods:
Microorganisms will be isolated by enrichment
Characterization of microorganisms will be made by microbiological analyses and genetic method-sequencing of 16S rRNA
Intermediate products of the biodegradation will be determined by GC-MS and GC-GC-MS

Results:
1. On the basis of morphological, physiological, biochemical properties and sequencing of 16S rRNA there were identified as Arthrobacter sp. KM-4, Rhodococcus wratislaviensis KM-P, Rhodococcus erythropolis KM-2,4D.
2. Arthrobacter sp. KM-4 mineralize in 36 hours with the initial level of pyridine as high as 1.5 g/l, in 24 hours with the initial levels of 2-methylpyridine as high as 2 g/l, of 4-methylpyridine -1.5 g/l, of 2,6-dimethylpyridine - 3 g/l.
Rhodococcus wratislaviensis KM-P mineralize in 48 hours with the initial level of pyridine as high as 1.5 g/l.
Rhodococcus erythropolis KM-2,4D mineralize in 48 hours with the initial level of 2,4-dimethylpyridine as high as 1 g/l. 3. According to the structures of identified intermediates schemes of biodegradation were proposed.

Conclusions:
1. New strains were identified.
2. The strains are extremely efficient completely degrading pyridine and alkylpyridines.
3. Degradation schemes based on the identified products were proposed.

References:
1. F. M. Khasaeva, L. V. Modyanova, L. I. Vorobiova, P. B. Terentiev, Biodegradation of 2,4-Dimethyl Pyridine by Rodococcus sp strain, Biotechnologiya (Russ) (2008), 1, 72-78.