Uptake of K^+,Cs^+ and Rb^+ and their influence on accumulation and reduction capacity of Cr(VI) by highly resistant Arthrobacter species

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Abstract

Some bacteria from Arthrobacter genera have great potential for bioremediation. Two strains of Arthrobacter, one isolated from Georgia, contaminated Kazreti region and second- from Columbia basalt rocks of contaminated site of the USA, exhibit resistance against high concentrations of Cr(VI) and other metallic ions. They can reduce highly toxic and carcinogenic Cr(VI) into Cr(III).

We investigated the behaviour of K^+, Cs^+ and Rb^+ on the Cr (VI) accumulation and reduction ability from Cr(VI) to Cr(III) by living *Arthrobacter oxydans* and *Arthrobacter globiformis 151 B*. Metal accumulation ability was analysed using Atomic Absorption Spectroscopy.

Discussion of Results

Potassium level inside bacterial cell reaches its maximum in the beginning of cultivation and starts to decrease after 30 minutes, as reduced Cr(III) content is increasing inside cells. Potassium ions here play the role of electrical signal conductors within bacterial biofilm, in order to respond to the "excitation stimulus" against toxic concentrations of heavy metals like Cr(VI).

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