

EXPLORING METAL RESISTANT MICROBES OF ARMENIAN MINING AREAS IN ORDER TO FIND NEW MEANS FOR BIOREMEDIATION

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A plethora of different types of heavy metals are used and emanated through various human activities including mining, agriculture, urbanization and industrialization, which inevitably leads to environmental contamination problems. The diverse bacterial groups have developed abilities to deal with the toxic levels of heavy metals and could be prospective tools for bioremediation of contaminated environments. The main goals of the presented work were the determination of the heavy metal resistant microbes in the Armenian mines and tailings based on cultivation approaches, selection of the high heavy metal resistant strains and the study of their ability to detoxify and accumulate toxic metal ions.

A total of 40 mesophilic, acidophilic and alkaliphilic metal-tolerant bacteria were isolated from the samples of the Sotck gold mine, Shamlugh, Kapan, Kajaran copper mines, Akhtala and Artsvanik tailings. Based on 16S rDNA sequence analyses the isolates were identified as members of *Arthrobacter*, *Algoriphagus*, *Bacillus*, *Brevibacillus*, *Comamonas*, *Geobacillus*, *Micrococcus*, *Methylobacterium*, *Pseudomonas*, *Rheinheimera*, *Sinomonas* and *Stenotrophomonas* genera. Tolerance towards Cu(II), Cd(II), Zn(II), Ni(II), Co(II), Mo(II) and Cr(VI) was studied, and it was found that all strains are highly resistant to Mo(II), Cu(II) and Ni(II), and sensitive to Cd(II) and Zn(II). *Bacillus* strains also exhibited high resistance towards Cr(VI) and showed toxic chromium reduction ability up to 50% of chromium from the growth medium.

The study of the heavy metal bioaccumulation ability of the strains showed that *B. subtilis* AG4, *B. thermoruber* AG1 and *B. megaterium* AA1 could be consider as high bioaccumulators of Cu (around 70%) and Cd (around 90%).

The newly isolated metal tolerant strains could have potential in biotechnology and bioremediation.

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