

Effect of pH and time on the accumulation of heavy metals in Gram-negative bacteria

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Abstract. The release of heavy metals into our environment is very important and causes an environmental pollution problem. Contamination of the aquatic environment by toxic heavy metals is a serious pollution problem because they can reach water-courses either naturally through a variety of geochemical processes or by direct discharge of municipal, agricultural and industrial wastewater. The bioremediation of heavy metals using microorganisms has received a great deal of attention in recent years because their potential application in industry. Microorganisms uptake metal either actively (bioaccumulation) and passively (biosorption). Some bacteria have developed chromosomally or extra-chromosomally controlled detoxification mechanisms to overcome the detrimental effects of heavy metals. In the present work, we have studied resistance to heavy metals and the capacity of a Gram-negative bacteria to accumulate lead and zinc. Results obtained indicated that the bacterial strain exhibited high Minimal Inhibitory Concentration (MIC) values for metal ions tested ranging from 75 mg/l to 500 mg/l and it was able to accumulate more than 90% of lead and zinc during the active growth cycle. Effect of pH and time on heavy metal removal was also studied properly.

Keywords: Gram-negative bacteria, heavy metals, bioaccumulation.