International Journal of Microbiology 2017 vol.2017

Assessment of Resistance and Bioremediation Ability of Lactobacillus Strains to Lead and Cadmium

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Abstract

© 2017 Anna V. Kirillova et al. Cadmium (Cd) and lead (Pb) are heavy metals, important environmental pollutants, and potent toxicants to organism. Lactic acid bacteria (LAB) have been reported to remove Cd and Pb from solutions and therefore represent a useful tool for decontamination of food and beverages from heavy metals. Heavy metal ion binding by LAB was reported as metabolism-independent surface process. In this work ten Lactobacillus strains were investigated with respect to hydrophobicity, Lewis acid-base, and electrostatic properties of their outer cell surface in order to characteriz e their Cd and Pb removal capacity. Seven L. plantarum and L. fermentum strains were shown to remove Cd from culture medium. The metabolism-dependent accumulation mechanism of Cd removal was proposed based on extended character of Cd binding and lack of correlation between any of the surface characteristics and Cd removal. The results of this study should be considered when selecting probiotic strains for people at risk of Cd exposure.

http://dx.doi.org/10.1155/2017/9869145

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