



HP-38: Isolation and identification of cadmium resistant lactic acid bacteria for application as metal removing probiotic

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Subject description: One of the useful properties of probiotic bacteria is their capacity to bind different targets, thus eliminating them through feces. It is supposed that one of these targets could be cadmium, a widespread environmental toxicant that causes various disturbances in biological systems.

Objectives: The purpose of the present study was to isolate and identify the metalresistant lactic acid bacteria from Infant faeces samples to remove cadmium in order to highlight the importance of some probiotic LAB in the detoxification of these pollutants at the level of the digestive tract or in fermented foods.

Methods: Collected sediment,samples were used to isolate the cadmium resistant bacterial colonies by spread plate technique using agar media (De Man, Rogosa and Sharpe) supplemented with cadmium at 50 mg/l. Isolates were identified by sequencing of 16S ribosomal deoxyribonucleic acid. . Metal removing probiotic was determined by using flame atomic absorption spectrophotometry (Shimadzu AA-6200).

Results and discussion: Further study was conducted using the strain E1T1 identified as *Enterococcus durans* since it showed the highest cadmium (MIC 600 mg/l) and other heavy metals resistance capacity and better probiotic properties. The selected strain had good auto-aggregation characteristic and a high surface hydrophobicity that enhanced its adhesion ability to epithelial cells Furthermore, it had excellent cadmium removal efficiencies, with rates of 65.94% after 96 hours in living cells with high cadmium accumulation efficiencies, with an estimated value of 11.47 mg Cd/g of cells (wet weight).

Conclusion: From the viability and metal removal points of view, it can be concluded that isolated metal-resistant *E. durans* E1T1 strains might be used as potential probiotic strains for removing heavy metals.

Keywords: *Enterococcus durans*, Probiotic, Heavy metal, Removal efficiency, Cadmium