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Isolation and identification of a Lactobacillus sp. from dairy products as a novel selenium reducing probiotic

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Background and Aims: Selenium (Se) is a micronutrient metalloid with extensive applications. Among the different selenium compounds, the red elemental selenium showed lower in vivo and in vitro toxicity. In the other hands, some bacteria can produce the elemental Se by reducing the higher oxidation state of this element. Among the bacteria some Lactobacillus sp. plays an important role in food biotechnology and they were generally recognized as safe. In this study, a potent Se reducing Lactobacillus sp. has been isolated from dairy products and identified by various biochemical test and 16s rDNA analysis method.
Methods: Samples of dairy products were serially diluted in sterile Nacl (0.9%) and spread onto MRS agar supplemented with SeO2 (1.26 mM). The plates were incubated at 37◦C for 48h. The red colony was selected for more purification by multiple subculturing. The phenotypic and physiological characterization of the isolate was carried out by the methods described in Bergey's manual of systematic bacteriology and 16S rDNA sequence analysis. A large fragment of the 16S rDNA gene was amplified using universal primers (27F and 1492R). Sequence similarity searches were done with the BLAST database (National Center for Biotechnology Information).
Results: The isolated strain can intra-cellulary convert the Se4+ ions to red elemental Se0. The morphological studies showed that the isolated strain is a rod-shaped and gram-positive Based on the biochemical tests the isolated bacterium was inferred to be a strain of the Lactobacillus family. The BLAST results confirmed the biochemical test.
Conclusions: We screened and identified a potent Lactobacillus sp in reducing the Se4+ ions which can be used as a new probiotic for using the combined benefit of the elemental Se and lactobacillus species in future studies.

Keywords: Lactobacillus sp; Elemental selenium; Dairy products; 16S rDNA analysis