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The Study of the Microbiome of Cheeses from Different Regions of Armenia and the Use of Lactic Acid Bacteria Isolated from Hem in Cheese Making

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ABSTRACT

Selecting fermenting microbial strains with both industrial and probiotic properties is essential for the development of new functional foods. Therefore, the search for and discovery of such strains remain crucial. The aim of this study was to investigate the probiotic and industrial properties of lactic acid bacteria isolated from cheeses for their application in cheesemaking. The growth rate of lactic acid bacteria, as well as the effects of metal ions and vitamins on their growth, were studied photometrically. Acid production was measured potentiometrically, proteolytic activity was assessed using polyacrylamide gel electrophoresis, and antibiotic resistance was determined using the well-diffusion method. The anti-yeast activity of the strains was assessed using the double-layer agar diffusion method. It was demonstrated that the *Lactobacillus delbrueckii* subs. *lactis* Ch 3.4 strain exhibited proteolytic activity, while the *Lacticaseibacillus rhamnosus* Ch 7.1 strain displayed lipolytic activity. Both strains were capable of fermenting a wide range of carbohydrates, making them valuable fermenting microorganisms for production. The effects of metal ions (Ca^{2+} and Mg^{2+} 10 mM final concentration of each) and vitamins (C- 130 μg/ml, B6- 80 μg/ml, B12- 2 μg/ml) are strain-dependent and vary depending on the test organism. The two strains studied do not exhibit anti-yeast activity. They are mostly sensitive to antibiotics and show no cytotoxic effects. These findings highlight the potential of these lactic acid bacteria strains as promising candidates for industrial and probiotic applications in cheesemaking and other functional food development.

Keywords: lactic acid bacteria, functional food, probiotic properties, antagonistic activity, Ca and Mg ions, vitamins

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