

Title: Isolation of bacteriocin-producing lactic acid bacteria from minas frescal cheese with activity against foodborne pathogens

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Abstract:

Lactic acid bacteria (LAB) are a group of industrially important organisms involved in various fermentative processes. In recent years, due to their antagonistic potential against pathogenic and spoilage microorganisms, LAB have been utilized by the food industry in biopreservative processes. The antagonistic activity of LAB is attributed to competition for nutrients and is reinforced by the inhibitory effects of their metabolites, especially, bacteriocins. The objective of this study was to isolate autochthonous bacteriocin-producing LAB from frescal minas cheese with inhibitory activity against foodborne pathogens. For this, cheese samples in the beginning and in the end of shelf life were enriched in saline peptone water and pour plated onto De Man Rogosa and Sharpe agar. Inhibitory activity was detected by the antagonism assay, using *Listeria monocytogenes* ATCC 7644 and *Staphylococcus aureus* ATCC 25923 as indicator strains. Eighteen LAB isolates were selected and subjected to the spot-on-the-lawn test, Gram staining, KOH reaction and catalase production. Inhibition due to organic acid production and to bacteriophages presence was excluded. After checking the proteinaceous nature of the inhibitory substance (using Proteinase K from *Tritirachium album* and Protease XIV from *Streptomyces griseus*), five LAB isolates were selected for the well diffusion assay. *L. monocytogenes* ATCC 7644, *S. aureus* ATCC 25923, *Listeria innocua* (food isolate), *Lactobacillus sakei* 1 and *Lactobacillus sakei* ATCC 15521 were used as indicator microorganisms. Four LAB isolates showed good antagonistic activity against all the selected indicators. These results indicate that the isolated LAB may have potential for use as biopreservative cultures in dairy products. Additional studies are being conducted to confirm this assumption.

Keywords: lactic acid bacteria, bacteriocins, *Listeria monocytogenes*, *Staphylococcus aureus*

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