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EVALUATION OF THE BACTERIOSTATIC ACTIVITY OF A POTENTIALLY PROBIOTIC LACTIC CULTURE AGAINST FOOD CONTAMINATION INDICATORS

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Probiotics are defined as “live microorganisms that, when administered in adequate amounts, confer a health benefit on the host”. These microorganisms can also contribute to the biopreservation of food, improving food safety by inhibiting spoilage and pathogenic microorganisms through the production of primary and/or secondary metabolites. The present study aimed to evaluate the minimum inhibitory activity of the potentially probiotic autochthonous Limosilactobacillus mucosae CNPC007 against important microbial indicators of food contamination. The inoculum with L. mucosae cells (I) in de Man Rogosa Sharpe broth (MRS), non-neutralized supernatant (S), or neutralized supernatant (NS), prepared with sterile NaOH (4 N) up to reach pH 7.0, were used. To determine the minimum inhibitory concentration (MIC) against the microbial indicators, the reference strains Staphylococcus aureus ATCC 25923 and Salmonella enterica subsp. enterica serovar Typhimurium ATCC 14028, as well as a clinical isolate of Escherichia coli, were used. The S and NS samples were obtained after centrifugation of the culture of L. mucosae CNPC007 containing a population around 1.2 × 108 CFU/100 ?L, for 10 minutes at 11,000 × g, 3 times. The microplate microdilution method was used to determine the MIC with 100 ?L of sterile Mueller Hinton (MH) broth distributed in the wells to perform serial dilutions. Subsequently, 100 ?L of I, S and NS were added, obtaining concentrations of 50%, 25%, 12.5%, 6.25% and 3.12%. The contamination indicator suspensions were added at a concentration of 105 CFU /100 ?L to each well. As a positive control for turbidity (T), 100 ?L of the standardized suspension of the contamination indicators added to the sterile MH broth was used. As a negative control (NC), only the sterile MH broth was used. As a positive control for antimicrobial activity (PC), 100 ?L of the standardized suspension of the contamination indicators added with 100 ?L of ciprofloxacin at a concentration of 0.3 g/100 ?L were used. The microplates were incubated for 24 h at 35 ± 2 ºC, and the MIC was determined by evaluating the turbidity of the well; S was able to inhibit the growth of all indicators at a concentration of 12.5%, NS did not show inhibitory activity and, due to limitations of the method, it was not possible to determine the MIC of I. According to the results, it is suggested that the antimicrobial activity of L. mucosae is related to the production of organic acids during the metabolization of glucose present in the MRS broth. Thus, the non-neutralized supernatant of L. mucosae CNPC007 strain grown in MRS broth demonstrated bacteriostatic capacity against the microbial contamination indicators studied in vitro and may be promising as a natural preservative for the food sector.

References

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