

**TITLE:** *IN VITRO* EVALUATION OF POTENTIAL PROBIOTIC PROPERTIES OF *LACTOBACILLUS CASEI* V5 ISOLATED FROM VIILI

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**ABSTRACT:**

Viili is a dairy product from Nordic countries particularly popular in Finland. The most traditional viili culture consist of a symbiotic cluster of viable abundant probiotics, including lactic acid bacteria, fungus and yeasts. This study evaluated the potential probiotic characteristics of LAB isolated from viili. This isolate was identified according to the 16s rRNA sequencing and evaluated for the probiotic potential of tolerance to sodium chloride (2%, 4% and 6% w/v) and temperature 15 °C and 45 °C, antimicrobial potential, antibiotic resistance, auto-aggregation and coaggregation ability and simulated gastric and enteric conditions. A region of the 16S rRNA gene sequence of the isolated lactic acid bacterium was amplified by PCR and the highest level of similarity in the gene sequence was *Lactobacillus casei* (100%). The result showed that *L. casei* V5 presented high tolerance to the simulated gastrointestinal conditions, surviving at a rate of 58.62% after the final enteric phase. The inhibition zone diameter showed that V5 strain was sensitive to amoxicillin and clavulanic acid (35.66±1.15 mm), tetracycline (23.33±1.62 mm), cefoxitin (18.67±1.15 mm) and showed resistance to gentamicin (6.33±0.56 mm). The multilayer agar plates showed positive results, in which were verified the inhibition halos on the growth of the indicator microorganisms tested, *Escherichia coli* ATCC 25922 and *Salmonella enteritidis* ATCC 13076, around the areas corresponding to the growth of *L. casei* V5. The V5 strain had high autoaggregation percentage, reaching 24%. This result indicates a high ability to adhere to epithelial cells and mucosal surfaces. *L. casei* also coaggregated similarly with selected food-borne pathogens. Moreover, V5 strain had a capacity to grow at higher concentrations of sodium chloride (6% w/v) and at a temperature of 45 °C (6.38±0.05 log CFU/mL). The heat tolerance of *L. casei* V5 indicated it to be a strain with potential application in food manufacturing processes and formulation technologies under industrial conditions. In conclusion, this LAB strain could serve as promising probiotic candidates for the preparation of functional food products.

**Keywords:** Lactic acid bacteria, Aggregation activity, gastrointestinal survival

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