

## ABSTRACT

The study aimed to determine the probiotic and safety properties of a bacterial strain isolated from Kenyan traditionally fermented milk called Amabere amaruranu. Probiotic characteristics of the isolate were assessed based on its ability to survive artificial simulated conditions of the digestive tract including temperature sensitivity, low pH and phenol tolerance, and antagonistic activity against human bacterial (*Staphylococcus aureus*, *Escherichia coli*, and *Salmonella enterica* Typhimurium) and fungal (*Candida albicans*) pathogens. Safety analysis was based on hemolytic activity and antibiotic susceptibility against most common antibiotics namely: nalidixic acid, ampicillin, azithromycin, ciprofloxacin, tetracycline, gentamicin, and chloramphenicol using zone of diameter of inhibition (ZDI). The isolate survived and grew in low pH (2.0–3.5), tolerated 0.4% phenol, and survived temperature ranges of 20°C, 30°C, and 37°C but showed partially reduced growth at 45°C. It exhibited strong antagonism against all pathogens (ZDI>20 mm). Antagonism was strongest towards *S. enterica* serovar Typhimurium (ZDI = 59 mm) and lowest towards *E. coli* (ZDI = 33 mm). The isolate was sensitive to azithromycin (ZDI = 31± 2.08), chloramphenicol (ZDI = 26 ±2.34 mm), gentamycin (ZDI = 26 ±1.41mm), and tetracycline (ZDI = 32 ±1.73 mm), resistant to nalidixic acid (ZDI = 0.0 ±0.00 mm), while susceptibility towards ampicillin and ciprofloxacin was intermediate. The isolate also exhibited  $\gamma$ -hemolytic activity and was identified as a *Levilactobacillus brevis* strain based on 16S rRNA gene sequencing. The isolate exhibited probiotic potential and was safe, affirming its potential application as a probiotic in the formulation of functional foods