

ABSTRACT

The aim of this study was to assess the probiotic potential and safety profile of a *Lactobacillus plantarum* strain isolated from Kenyan spontaneously fermented milk, Amabere amaruranu. The *Lactobacillus plantarum* isolate was tested for temperature sensitivity (at 15°C, 30°C, 37°C, and 45°C), pH tolerance (at 2.0, 2.5, 3.0, 3.5, and 6.5 as control), and 0.4% phenol tolerance to observe its survival in the gastrointestinal tract of humans. For safety evaluation of the isolate, antagonistic activity was tested against pathogenic strains of *Staphylococcus aureus*, *Escherichia coli*, *Salmonella enterica* serovar Typhi, and *Candida albicans*, while antibiotic susceptibility pattern was examined using nalidixic acid, ampicillin, azithromycin, ciprofloxacin, tetracycline, gentamicin, and chloramphenicol antibiotic discs and haemolytic activity was done using lamb blood agar. *Lactobacillus plantarum* isolate had an optimal growth at 37°C, it also demonstrated low pH tolerance (2.0–3.5). It was able to maintain its viability (~100%) after exposure to 0.4% phenol. The selected isolate showed inhibition (antagonistic activity) against the pathogens with *S. typhi* having the largest (ZDI = 31.0 ± 1.73 mm) zone of diameter inhibition (ZDI) and *Candida albicans* having the least (ZDI = 18.0 ± 0.76 mm). *Lactobacillus plantarum* isolate was sensitive to Azithromycin, tetracycline and chloramphenicol and was intermediately sensitive to gentamycin, while it was resistant to nalidixic acid, ampicillin, and ciprofloxacin. The isolate also exhibited γ -haemolytic activity hence safe for use as a starter culture. The selected isolate can be used as a starter culture and a probiotic since it had excellent probiotic properties.

Key words: *Lactobacillus plantarum*, probiotics, antibiotic susceptibility, antagonistic activity, Lactic acid bacteria, Amabere amaruranu.