PROBIOTIC PROPERTIES AND SAFETY PROFILING OF *Lactobacillus plantarum* ISOLATED FROM SPONTANEOUSLY FERMENTED MILK, *Amabere Amaruranu*

Mercy M. Katiku[1*], Joseph W. Matofari[1], John Masani Nduko[1]
[1]Department of Dairy and Food Science and Technology, Egerton University, P.O Box 536-20115, Egerton, Kenya.
Corresponding author
*mwikalim30@gmail.com; *Tel No. +254701922176*

ABSTRACT

The aim of this study was to assess the probiotic potential and safety profile of a *Lactobacillus plantarum* isolate. The probiotic properties tested on *Lactobacillus plantarum* already isolated in a previous study included temperature, pH tolerance and 0.4% phenol tolerance. For safety evaluation of the isolate, antagonistic activity was tested against selected pathogenic strains, while antibiotic susceptibility was examined against commonly used antibiotics and hemolytic activity was done using lamb blood agar. *Lactobacillus plantarum* isolate growth was measured in cfu/ml which was transformed into $\log_{10}$. The isolate had an optimal growth at 37°C and 30°C while decrease in growth was observed at 20°C and 45°C. The survival of the microbial isolate on acidic media was affected by the acidic pH (2.0 – 3.5) compared with the control pH (pH 6.5), although the highest growth was observed at pH 3.0 and pH 3.5 compared to pH 2.0 and pH 2.5. 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). It was highly sensitive to azithromycin (ZD> 21 mm) and resistant to nalidixic acid (ZDI< 15 mm).The isolate also exhibited γ-haemolytic activity hence safe for use as a starter culture and was identified as a Lactobacillus plantarum strain Eger202111 based on 16S rRNA gene sequencing. 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