

Abstract

Probiotics are live microbial feed supplements, which positively affect the host animal by improving its intestinal microbial balance. Studies have shown probiotic activities of Lactococci isolated from dairy foods, which include the ability to inhibit the growth of other bacteria and the reduction of cholesterol. However, there is limited documented work on the probiotic activity in Lactococci from plant materials. The present study isolated and tested cholesterol reduction ability (in-vitro) of *Lactococcus lactis* isolates from fermented smooth pigweed (*Amaranthus hybridus*) leaves. The specific objectives were to: isolate *L. lactis* bacteria from *A. hybridus* leaves harvested at maturity (30 days), determine cholesterol reduction ability of *L. lactis* isolated from the *A. hybridus* leaves and establish whether there were any differences in the amounts of cholesterol reduced from the growth media by *L. lactis* and *Lactobacillus acidophilus* ATCC 43121 (the positive control). It further aimed at determining whether fermentation affected protein, mineral and moisture content in amaranthus leaves and the acceptability of the fermented leaves as compared to fresh boiled leaves. To achieve this, *A. hybridus* was grown at Kenya Agricultural Research Institute in Njoro. The leaves were harvested at maturity and fermented for five days. After fermentation, *L. lactis* strains were isolated and their ability to remove cholesterol from the growth medium tested. This ability was compared with that of *Lb. acidophilus* ATCC 43121. Consumer acceptability of the fermented leaves was also compared to freshly boiled leaves. The Lactococcal strains isolated reduced cholesterol level by 52 µg/ml and *Lb. acidophilus* ATCC 43121 reduced by 56 µg/ml indicating a similar reduction capability ($p < 0.05$) to that of the standard *Lb. acidophilus* ATCC 43121 probiotic. After fermentation, protein decreased from 36.07 to 16.65%, ash increased from 19.76 to 36.21% and moisture content increased from 5.44 to 6.22%, respectively. There was no significant difference ($p < 0.05$) in consumer acceptability whereby, the consumers scored 6.90 points for fermented leaves compared to av6.83 points scored by consumers for fresh boiled leaves. This study concluded that fermented amaranthus leaves dish is a potential source of probiotics as the level of cholesterol reduction by the isolated Lactococcal strains compares favourably with the reduction levels of the control *Lb. acidophilus* ATCC 43121 which is a known probiotic.