



Investigation of probiotics potential of *Lactobacillus plantarum* strains isolated from traditionally fermented maize and cassava.

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ABSTRACT

Background: Probiotics are beneficial microorganisms that confer health benefits to the host when consumed in adequate amounts. Traditionally fermented foods serve as important natural sources of these organisms. Indigenous fermented foods such as *ogi*, fermented corn flour, fufu and tapioca from maize and cassava harbour diverse lactic acid bacteria with potential probiotic and antimicrobial properties.

Objectives: This study was carried out to isolate and identify *Lactobacillus plantarum* from fermented maize and cassava products, and to characterize some genetic profiles of the isolated *Lactobacillus plantarum* strains using Whole Genome Sequencing

Methods and Results: Two strains of *Lactobacillus plantarum* LP1 (isolated from fermented maize) and LP2 (from fermented cassava), were characterized for key probiotic attributes using whole genome sequence. Both strains demonstrated remarkable presence of essential genes such as mucin 22, *fbp*, *dltD*, *bsh*, and *pln* genes which are associated with probiotic functionality, particularly those involved in cellular adhesion, bile salt resistance, bacteriocin production and immune regulation. Both strains possessed plantaricin associated genes (*plnA* – *plnH*) indicating bacteriocin producing potentials. Genomic analysis also identified seven prophage regions in both isolates, while CRISPR analysis showed one CRISPR array in LP1 and two CRISPR array in LP2.

Conclusion and application of results: These results indicate that *L. plantarum* strains from indigenous fermented foods possess promising probiotic and antimicrobial characteristics, suggesting their potential application in functional foods and therapeutic formulations.