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Screening of Antibacterial Properties of Bacteriocins from *Bacillus* Species Isolated from Fermented Food

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Abstract

The preservation of food with chemicals to maintain food quality and enhance food safety dates back to the 20th century. Despite its extensive use, there has been increasing consumer demands for more natural and minimally processed food due to several reasons, including association of some chemical preservatives with cancer. This has augmented research on novel and natural food preservation techniques. Bacteriocins from LAB have been widely investigated as alternatives. Lately, bacteriocins from *Bacillus* spp. have been proven to have additional benefits compared to those produced by LAB. The aim of this study was to investigate the potential production of bacteriocins by *Bacillus* spp. for use as food bio-preservatives. *Bacillus* spp. were isolated from fermented food and presumptively identified using morphological and biochemical tests. The isolates were further confirmed by 16S rRNA sequencing. Bacteriocins were extracted by precipitation with ammonium sulphate and antimicrobial activity was determined with the disc diffusion and broth microdilution assays. A total of 8 bacteriocins with antimicrobial potential were extracted from various *Bacillus* spp., including *B. subtilis*, *B. amyloliquefaciens*, and *B. licheniformis*. The highest inhibition by the extracts occurred against *Escherichia coli* and *Listeria innocua*. In general, both Gram positive and Gram-negative microorganism were susceptible to the bacteriocins. The lowest MIC 2560AU/ml was recorded against *Salmonella typhi*. The results of this study show potential application of bacteriocins from fermented food as biopreservatives. Further analysis are required to purify and characterize the bacteriocins to ensure their safe and effective use in a food system.

Biography: Talent Ngurube

Talent Ngurube was born and raised in a traditional household in Zimbabwe and is a mother of one. Talent Ngurube attended high school where she tried to make most of her time and participate in as many extracurricular activities as possible. At high school she played chess and was a member of Girl child network organization. She took part in STEM and Intellectual property rights workshops. She earned a Bachelor of Technology Honours degree in Biotechnology from Harare Institute of Technology in Zimbabwe in 2016. Her Capstone Design project was titled, Evaluation of the Antibacterial Activity of Phytochemicals in *Combretum molle* against methicillin-resistant *Staphylococcus aureus* specie. In 2016 Talent Ngurube received an award as the Best Student in Medical Biotechnology at Harare Institute of Technology.