ABSTRACTS

9TH INTERNATIONAL CONFERENCE OF SABARAGAMUWA UNIVERSITY OF SRI LANKA

AND

4TH CHINA - SRI LANKA COMMUNICATION AND COOPERATION FORUM

"Advancing Multidisciplinary Approaches for a Sustainable and Resilient Future"

6 - 8 December 2023

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Centre for Research and Knowledge Dissemination

Sabaragamuwa University of Sri Lanka

ICSUSL 2023

9th International Conference of Sabaragamuwa University of Sri Lanka
https://www.icsusl.sab.ac.lk

Organized by the Centre for Research and Knowledge Dissemination (CRKD) of the Sabaragamuwa University of Sri Lanka
6 - 8 December, 2023

ISSN 2815-0341

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Editor-in-Chief : Prof. H.S.R. Rosairo

Published by : Sabaragamuwa University of Sri Lanka
Contact : chair@icsusl.sab.ac.lk

Unveiling the Probiotic Properties of Lactic Acid Bacteria Inhabiting Tender Coconut Water

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This research delves into the unexplored potential of tender coconut water as a rich source of probiotics, with a focus on identifying promising probiotic lactic acid bacteria (LAB). By employing biochemical screening techniques, four potential LAB strains were isolated: *Lactiplantibacillus plantarum* CWJ3, *Lacticaseibacillus paracasei* CWKu14, *Lacticaseibacillus rhamnosus* CWKu12, and *Lacticaseibacillus casei* CWM15. These strains were comprehensively assessed to evaluate their resilience under various conditions: $_{p}$H (2, 3, and 6.5), bile (0.3% and 0.5%), phenol (0.4% and 0.6%), salt (3% and 6%) concentrations, and temperatures (20°C, 37°C, 45°C, and 60°C). Further, resistance to lysozyme (100 mg L^{-1}), artificial saliva juice (0.3% α-amylase, at $_{p}$H 6.9), simulated gastric juice (0.3% pepsin, at $_{p}$H 2), and simulated intestinal juice (0.3% Ox-gall and 0.1% pancreatin at $_{p}$H 7) were determined. Their antibiotic susceptibility was tested against ten antibiotics at 100 ppm, and cell surface hydrophobicity, auto-aggregation, co-aggregation with selected pathogens, antibacterial activity, hemolytic activity, and DNase activity, also were evaluated. The statistical analysis demonstrated the survival of all four strains even in demanding circumstances, with *Lactiplantibacillus plantarum* CWJ3 displaying the greatest resilience. Optimum growth occurred at 37°C, while none of the strains survived at 60°C. A $_{p}$H of 6.5 was optimal for their growth, and *Lactiplantibacillus plantarum* CWJ3 stood out as the only strain capable of withstanding $_{p}$H 2 after 2 hours. *Lacticaseibacillus rhamnosus* CWKu12 and *Lacticaseibacillus casei* CWM15 showed the highest percentage of auto-aggregation and co-aggregation while *Lacticaseibacillus rhamnosus* CWKu12 and *Lactiplantibacillus plantarum* CWJ3 exhibited high cell surface hydrophobicity. The strains displayed susceptibility to Clarithromycin, Erythromycin, and Azithromycin, but resistance to Cefuroxime and Streptomycin antibiotics. All four strains inhibited various food-borne pathogens, showcasing their potential as probiotics. Moreover, they displayed no hemolytic or DNase activity. Remarkably, *Lactiplantibacillus plantarum* CWJ3 excelled in challenging environments, making it a noteworthy contender for a probiotic role.

Keywords: Lactic acid bacteria, Probiotics, Tender coconut water, Tolerance