

VIABILITY OF PROBIOTIC BACTERIA INHABITING TENDER COCONUT WATER UNDER ARTIFICIAL SALIVA AND SIMULATED GASTROINTESTINAL JUICE CONDITIONS

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Probiotics are live microbes that promote human health, with potential benefits. Tender coconut water is an unexplored promising source of probiotics. This study aimed to identify probiotic strains from tender coconut water that can survive under human gastrointestinal conditions. Tender coconut samples from seven districts in Sri Lanka were collected and used for isolation. After biochemical screening, four probiotic strains were identified up to species level by 16S rRNA gene sequencing: *Lactiplantibacillus plantarum* CWJ3, *Lacticaseibacillus paracasei* CWKu14, *Lacticaseibacillus rhamnosus* CWKu12, and *Lacticaseibacillus casei* CWM15. The tolerance of these strains under artificial saliva juice (ASJ) with 0.3% α -amylase at pH 6.9, simulated gastric juice (SGJ) with 0.3% porcine stomach mucosa pepsin at pH 2, and simulated intestinal juice (SIJ) with 0.3% Ox-gall, and 0.1% pancreatin at pH 7 was analyzed. To assess their survival rates, overnight cultures of each bacterial strain incubated in deMan, Rogosa, and Sharpe (MRS) broth at 37 °C were used. Washed cells were used to prepare a 10⁹ CFU mL⁻¹ suspension. Each strain was then suspended in ASJ for 5 minutes, SGJ for 120 minutes, and SIJ for 120 minutes at 37 °C in sequence, followed by an evaluation of the survival rate. All four strains survived under these gastrointestinal conditions. The results indicated no significant difference ($p > 0.05$) in survival under ASJ among the four strains, with an average survival rate of 96%. However, significant differences ($p < 0.05$) were observed in survival under SGJ and SIJ. Notably, *L. plantarum* CWJ3 exhibited the highest tolerance rate in SGJ (70.69%) and SIJ (74.59%) conditions. The findings of this study provide valuable insights into the survival potential of probiotic strains under gastrointestinal conditions. Further research in this area may contribute to developing functional beverages using tender coconut water to improve gut health and overall well-being.

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