Isolation and Characterization of Lactic Acid Bacteria Isolated from Nypa fruticans Wurmb. Sap (Tuba): A Potential Antimicrobial and Antioxidant

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Nypa fruticans Wurmb. is a coastal plant widely sourced by communities as thatching material, wine, and vinegar. Several literature supports its use in sourcing renewable energy and fermentation, but is limited on bacterial isolation for therapeutics. In this study, Lactic Acid Bacteria (LAB) strains from tuba were isolated, characterized, and their bioactivity was determined. After 48 hours of anaerobic incubation of the 3-day old sap in de Man, Rogosa, Sharpe Agar, selected isolates were phenotypically characterized and confirmed for LAB presence molecularly. Using Agar-Overlay Assay, antimicrobial property of LAB was determined against E. coli BIOTECH 6148 and S. aureus BIOTECH 1583 with zone diameters ranging from 19.06 to 28.69 mm. Antimicrobial properties of cell-free supernatants (CFS) from LAB subcultures were determined using a Resazurin Microtitre CFS minimum inhibitory concentration which were 82.50 ng/μL against E. coli and 123.75 ng/μL against S. aureus. CFS exhibited a mean DPPH scavenging capacity ranging 33.05% ± 0.07 to 48.70% ± 0.04 which are significantly higher than DPPH values for a-tocopherol ($P < 0.05$). DNA protection from oxidative stress was determined by comparing retention of untreated Lambda DNA and treated with CFS against Hydroxyl radicals. There was a higher retention of CFS-treated DNA (21.16 ng) than the untreated DNA (7.11 ng) indicating DNA protection ($P < 0.05$). This study presents the potential of LAB and its CFS as an antimicrobial and antioxidant. This extends the utility of N. fruticans for enhancing immunity by introduction of sap-thriving probiotics. Keywords: Nypa fruticans, Lactic Acid Bacteria, Antimicrobial, Antioxidant

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