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DETERMINATION OF NUTRITIONAL AND FUNCTIONAL PROPERTIES OF SRI LANKAN TRADITIONAL FERMENTED RICE

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Abstract: This study analyzed the nutritional and functional properties of Sri Lankan traditional fermented rice (Diya Bath), focusing on the impact of fermentation duration (8, 12, and 16 hours) on the proximate composition of three rice varieties: Red Rice (RR), Fragrant Rice (FR), and Raw Nadu (RN). The proximate analysis revealed specific trends. Ash content exhibited minor fluctuations, with FR increasing from 0.45% to 0.46%, while RN and RR showed marginal changes from 0.42% to 0.365% and 0.39% to 0.358%, respectively. Protein content was relatively stable, ranging from 2.1% to 2.5% across all varieties, with RN consistently exhibiting slightly higher levels. Crude fat content increased in FR and RN, reaching 11.3% and 13.2%, respectively, while RR decreased to 10.7%. Moisture content showed a significant decline across fermentation durations, with reductions from 29.8% (FR), 30.1% (RN), and 27.0% (RR) at 8 hours to 19.0%, 18.2%, and 19.9%, respectively, at 16 hours. Microbiological analysis highlighted RN as the most effective substrate for lactic acid fermentation, achieving the highest lactic acid bacteria (LAB) growth (7.3×10^7 cfu/g after 16 hours), while FR was the least suitable (5.3×10^7 cfu/g at 16 hours). ANOVA results confirmed significant variations in moisture content across the fermentation durations ($p < 0.001$), with the highest moisture content recorded at 8 hours, followed by 12 and 16 hours. Fermentation duration influences the proximate composition and microbial activity of rice varieties. RN rice is ideal for lactic acid fermentation, with potential for optimizing production. Future research should explore biochemical processes to improve the nutritional and functional qualities of fermented rice.

Keywords: Fermented rice, Fermentation duration, Lactic acid fermentation, Proximate analysis.