

EFFECT OF CONCENTRATION, TEMPERATURE, AND pH ON ENRICHING DEGREE OF THE BIOACTIVE COMPOUNDS INTO RICE

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Bioactive compounds in plants with antioxidant activities (AOAs) are important to mitigate the chronic diseases that emerge due to oxidative stress. This study aimed to find the effect of pH, concentration and temperature on enriching degree of bioactive compounds for rice with the intention of find out a dietary solution for oxidative stress. The source of bioactive compounds in this experiment was the aqueous bark extract of *Syzygium cumini* L., while the improved white rice variety (Bg 300) was subjected to the enrichment. As part of this investigation, the steeping technique was used as the enriching treatment and three concentrations of *S. cumini* extracts (1 mg mL⁻¹, 2.5 mg mL⁻¹ and 5 mg mL⁻¹) at three pH levels (4.5, 7.0, and 9.5) and three temperatures (40°C, 55°C, and 70°C) were applied to enrich the rice samples while the control was untreated. The rice samples were dried to a moisture content of around 13% and finely powdered after being steeped. Samples were then digested with α -Amylase (2 mg mL⁻¹) and extracted with 70% methanol. To gauge the AOAs of the methanolic extracts and to determine the best treatment, *in vitro* assays such as total phenolic content (TPC), ferric reducing antioxidant power (FRAP) and 2,2-Diphenyl-1-picrylhydrazyl (DPPH) radical scavenging capacity were used and analysed with three factor factorial design. The results revealed that the sample steeped in 5 mg mL⁻¹ concentration, at 55°C and pH 4.5 displayed the significant enrichment ($p < 0.05$) of TPC (0.56 ± 0.02 mg GAE g⁻¹), FRAP value (0.095 ± 0.01 mg TE g⁻¹) and inhibition pertaining to DPPH ($65.20 \pm 0.01\%$) comparative to the control treatment. In conclusion, the extent of enrichment of bioactive compounds with AOAs in rice was influenced by treatment conditions such as pH, concentration, and temperature. This could have significant implications for dietary interventions aimed at combating oxidative stress and promoting overall health of chronic patients.

Keywords: Antioxidant activity, Methanolic extracts, Oxidative stress, *Syzygium cumini*