

Nephelium lappaceum L. peels as a source of phytochemicals with antioxidant and α -amylase inhibitory activities

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Nephelium lappaceum L. (Rambutan) is a popular seasonal fruit native to Southeast Asia, enriched in varieties of phytochemicals including vitamins and secondary metabolites. This fruit is consumed fresh, canned, or as a processed food, but unfortunately its consumption results in production of vast amounts of waste from its seeds and peels which eventually create mosquito breeding grounds. Therefore, this study was conducted to investigate the potential of utilizing fruit waste (peels) of Sri Lankan variety of rambutan, Malwana special as a source of phytochemicals with antioxidant and α -amylase inhibitory activities. Phytochemicals of dried rambutan peels were first extracted into methanol by Soxhelt extraction. Then the crude extract was sequentially partitioned in hexane, dichloromethane (DCM) and methanol (30%). Total phenolic content (TPC) and total flavonoid content (TFC) of methanol extracts of rambutan peels and its fractions were determined using Folin-Ciocalteu and aluminium chloride method, respectively. Among the fractions, the highest TPC of 141.73 ± 18.66 mg gallic acid equivalents/g dried weight was found to be in aqueous methanol fraction and the DCM and aqueous methanol fractions were rich in flavonoids with TFC of 136.41 ± 32.25 , and 110.67 ± 1.43 mg quercetin equivalents/g dried weight, respectively. Further, the radical scavenging properties of all the fractions were investigated using 1,1-diphenyl-2-picryl-hydrazyl (DPPH) free radical scavenging assay and their correlations with phenolics and flavonoids were analyzed using Pearson's correlation. The methanol extract of peels ($IC_{50} = 9.70 \pm 0.50$ $\mu\text{g/mL}$) and its aqueous methanol fraction ($IC_{50} = 12.04 \pm 0.80$ $\mu\text{g/mL}$) showed higher DPPH radical scavenging activity than that of the control, butylated hydroxytoluene ($IC_{50} = 13.92 \pm 1.19$ $\mu\text{g/mL}$). Strong positive correlations were observed between the antioxidant activity and the TPC and TFC with Pearson's correlation coefficients of 0.9018 and 0.8493, respectively. Interestingly, it was also found out that the *in vitro* α -amylase inhibitory activity of the aqueous methanol fraction of the peels ($IC_{50} = 75.17 \pm 3.40$ $\mu\text{g/mL}$) was significantly higher than the standard drug acarbose ($IC_{50} = 171.5 \pm 8.50$ $\mu\text{g/mL}$). Results revealed that the peels of Sri Lankan variety of rambutan, Malwana special is a potential source of phytochemicals with antioxidants and α -amylase inhibitory properties.

Keywords: Antioxidant, DPPH, Phenolics, Flavonoids, α -amylase

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