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DETERMINATION OF PHENOLIC CONTENT AND ANTIOXIDANT POTENTIAL OF A NUTRIENT SUPPLEMENT DEVELOPED USING SELECTED LOCAL GRAIN VARIETIES IN SRI LANKA

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Antioxidant properties of food products are significantly important due to their potential health benefits. This study investigates the antioxidant properties of an extruded composite flour mixture made of selected local grain varieties in Sri Lanka. The mixture was prepared by combining kalu heenati rice (*Oryza sativa*), black gram (*Vigna mungo*), green gram (*Vigna radiata*), meneri (*Panicum miliaceum*), black sesame (*Sesamum indicum*), black seeds (*Nigella sativa*) and cinnamon in statistically designed ratios to create a balanced nutritional profile. Several antioxidant assays were employed in triplicate to evaluate the antioxidant activity of the composite flour mixture, including total phenolic content (TPC), and radical scavenging activity using 2,2-diphenyl-1-picrylhydrazyl (DPPH), 2,2'-azino-bis (3-ethylbenzothiazoline-6-sulphonic acid) (ABTS) radicals and ferric reducing antioxidant power assay (FRAP). The results indicated that the TPC of the flour formulation was 0.45 ± 0.1 mg gallic acid equivalent /g dry weight. DPPH, ABTS, and FRAP assays revealed that the grain extract had antioxidant activities of 0.67 ± 0.3, 0.92 ± 0.1, and 0.72 ± 0.1 in mg trolox equivalent per gram dry weight (mg, TEAC/g dw) respectively. These values were significantly higher than that of a leading extruded composite flour mixture in the market ($p < 0.05$). The TPC of the market sample was 0.19 ± 0.2 mg gallic acid equivalent /g dw. DPPH, ABTS, and FRAP assays of this sample exhibited antioxidant activities of 0.50 ± 0.1, 0.74 ± 0.3, 0.59 ± 0.1 TEAC/g dw, respectively. These findings highlight the potential health benefits of the flour mixture as part of a balanced diet to enhance antioxidant defence. In conclusion, the presence of phenolic compounds, along with effective radical scavenging activity, contribute to the overall antioxidant potential of the composite flour mixture. Further investigations into the specific bioactive compounds of the flour mixture would provide valuable insights into the development of functional food products with enhanced antioxidant properties.

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