Molecular identification and selected nutritional and bio-active properties of Swayanjatha: a traditional food grain in Sri Lanka

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Swayanjatha is a traditional grain indigenous to Sri Lanka. To date, its molecular identification, nutritional and bio-active properties have been largely unexplored. The present study aimed to perform molecular analysis and evaluation of selected nutritional and bio-active properties of Swayanjatha. The molecular analysis was performed using the conventional Polymerase Chain Reaction (PCR) method. Nutritional properties of whole grains (n = 3) of Swayanjatha were performed to determine moisture, crude protein, crude fat, crude ash, crude fiber, and total carbohydrate content. Antioxidant potential was assessed through total phenolic content (TPC) and DPPH (2,2-diphenyl-1-picrylhydrazyl) radical scavenging activity, while anti-inflammatory properties were evaluated via nitric oxide and superoxide radical scavenging activities using 70% ethanolic extracts for whole grains using high-throughput screening methodologies (n = 3 each). PCR analysis revealed the absence of the rice endosperm-specific prolamin gene, indicating that Swayanjatha might not belong to the genus *Oryza*. The mean moisture, crude protein, crude fat, crude ash, crude fiber and total carbohydrate contents were 10.95 ± 0.24, 12.66 ± 0.09, 3.6 ± 0.10, 1.74 ± 0.00, 1.60 ± 0.12 and 80.44 ± 0.68% respectively. The TPC was 20.60 ± 0.48 mg gallic acid equivalents (GAE)/g of extract. DPPH radical scavenging activity demonstrated a dose-dependent response with an IC_{50} value of 129.72 ± 0.68 µg/mL [19.88 ± 0.47 mg Trolox equivalents (TEs)/g of extract]. Nitric oxide scavenging activity at concentrations of 0.25, 0.5, and 1.0 mg/mL was 38.72 ± 0.02, 40.80 ± 0.23, and 50.15 ± 0.31% respectively. Superoxide radical scavenging activity was 9.07 ± 0.82% at 2 mg/mL and 56.15 ± 0.87% at 4 mg/mL. It is concluded that further molecular analyses are warranted to elucidate its phylogenetic classification and Swayanjatha possesses desirable nutritional attributes along with notable antioxidant and anti-inflammatory properties.

Keywords: *Swayanjatha, Traditional food grain, Molecular identification, Nutritional properties, Bio-active properties*