Effects of Different Cooking Methods on Antioxidant Activity of Selected Underutilized Tuber Crops of Sri Lanka

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This study was carried out to investigate the effect of cooking on antioxidant activity of five underutilized tuber crops of Sri Lanka namely, *Dioscorea alata* (raja ala), *D.esculenta* (kukulala), *Amorphophallus paeoniifolius* (kidaran), *D. alata* (kondol), *D. alata* (hingurala) The two cooking methods tested in the study were frying and boiling. Selected tubers were peeled, cut into strips of 0.5 W x 4 L x 0.5 H cm separately. Then the strips were cooked separately either by boiling in water until soft or fried in coconut oil until golden brown and crispy for 15 minutes. Uncooked strips from each tuber variety served as controls. Methanolic extracts were prepared for boiled, fried and fresh tuber strips by shaking (780 rpm) shade dried finely powdered samples (20 g) with 30 ml of methanol. Total ascorbic acid content of each extract was measured by Iodometric titration method and total antioxidant activity was measured by 2,2-diphenyl-1-picrylhydrazyl (DPPH) and 2,2'-azino-bis(3-ethylbenzothiazoline-6-sulphonic acid) (ABTS) radical scavenging assays. Each experiment was conducted as 3 replicates. Results indicated that total ascorbic acid content of boiled yam extracts were significantly lower ($p < 0.05$) than the control and fried tubers. Raw yam extracts of all five varieties had higher ascorbic acid and antioxidant contents than cooked tuber extracts. The **DPPH** and ABTS radical scavenging capacity of boiled yam extracts were significantly lower ($p < 0.05$) than fried tubers. Amongst five varieties, highest radical scavenging capacity was shown by *Amorphophallus paeoniifolius* raw yam extract and lowest value was obtained for *D. alata* (hingurala) boiled yam extract ($p < 0.05$). IC_{50} values (concentration for 50% inhibition of DPPH) and ABTS·discoloration percentage of each variety was 85.2±2.7 µg $m1^{-1}$, 86±1% and 910.8±11.8 μg $m1^{-1}$, 9.57±1.89% respectively. Antioxidant activities of all cooked tubers are lower than the raw tubers. For all tubers boiling in water had lower antioxidant activity.

Keywords: Tuber Crops, Effects of cooking methods, Antioxidant activity, **DPPH** and ABTS assay