

Abstract No: BP-01

Bioactive compounds in *Dioscorea alata* L. (Raja ala) tuber cooking water collected under two common cooking methods

H. M. R. Amarasekara and S. R. Wickramarachchi*

Department of Chemistry, Faculty of Science, University of Kelaniya, Sri Lanka
suranga@kln.ac.lk*

Nutritional compounds in yams may leach out to the cooking water under most traditional domestic cooking. Finding alternative uses of these waste waters without discarding, will maximize the health benefits of these yams. This study aimed to quantify the bioactive compounds in the cooking water collected during boiling of *Dioscorea alata* L. tubers under two domestic cooking methods. Raja ala yams were diced and boiled in water using conventional boiling (CB) in a closed stainless-steel pot for 45 minutes and using pressure cooking (PC) in a pressure cooker type autoclave for an overall period of 30 minutes. The cooking water of both methods was collected, filtered, and concentrated by evaporating at 70°C to obtain the solid crude product. Aqueous solutions of the crude product (30 mg/mL) of CB (Crude-CB) and PC (Crude-PC) were prepared and subjected to qualitative phytochemical analysis. Further, they were assayed for total phenolic content (TPC), total flavonoid content (TFC), and total anthocyanin content (TAC). Antioxidant activity of each crude product was determined using 2,2-diphenyl-1-picrylhydrazyl (DPPH) assay and total antioxidant activity (TAA) was determined using the phosphomolybdenum assay. A correlation between the antioxidant activity and TPC, TFC and TAC of the samples was developed using the Pearson's correlation method. Phytochemical screening of crude-CB and crude-PC samples showed the presence of alkaloids, flavonoids, phenols, saponin, tannins and coumarins and an absence of proteins, thus indicating the presence of nutritional compounds in cooking water collected under both cooking methods. Crude-CB (14.713 ± 1.039 mg GAE/g FW) showed a significantly higher TPC than that of crude-PC (9.848 ± 0.548 mg GAE/g FW) whereas the TFC of crude-PC was higher than crude-CB suggesting that the leaching out of phenolic compounds including flavonoids are significantly affected by the cooking method. Both methods, however, showed no significant difference in TAC extraction implying that the loss of anthocyanins from the yam is similar when either of the two cooking methods are employed. IC_{50} values of crude-CB (209.014 ± 10.428 µg/ml) and crude-PC (371.615 ± 8.982 µg/ml) samples showed moderate activity in the cooking water. TAA of crude CB and PC samples were 0.917 ± 0.016 and 0.707 ± 0.002 mg GAE/mg FW respectively. Antioxidant assays showed higher activity in CB samples over the PC, suggesting that a higher amount of compounds with antioxidant activity have been leached out under the CB method than PC method. The strong correlation observed between TPC versus DPPH activity (IC_{50} value) ($r = -0.856$) and TAA ($r = 0.811$) of the samples confirms that the phenolic compounds that have leached out into the cooking water possess antioxidant activity. Finally, it can be concluded from the overall results that although the leaching out of phenolics and antioxidants into cooking water is inevitable under both cooking methods, a greater loss takes place under CB than the PC method.

Keywords: Antioxidants, Boiling, *Dioscorea alata* L., Phenolics, Pressure cooking