EFFECT OF PRE-TREATMENT AND COOKING TECHNIQUES ON ANTIOXIDANT CAPACITY AND TOTAL PHENOLIC CONTENT OF COMMONLY CONSUMED LEGUMES IN SRI LANKA

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It is evident that the antioxidants present in legumes can be lost due to pre-treatments and cooking techniques, thus this study was planned to compare the Antioxidant Capacity (AC) and total phenolic content (TPC) of chickpea *(Cicer arietinum),* cowpea (*Vigna unguiculata)* and green gram *(Vigna radiate)* after subjecting to combinations of pre-treatments (soaking and germination) and cooking techniques (cooking using clay pot, cooking using aluminum pot, pressure cooker and microwave oven). AC and TPC were determined using 2, 2-Azino-bis (3-ethylbenzothiazoline-6-sulfonic acid) assay and Folin-ciocaltue method respectively. Data were analyzed using two factor factorial completely randomized design. The untreated legumes were used as the control. In green gram, soaking followed by microwave cooking resulted the highest TPC (267.85 ± 4.54 mg GAE/100g DW) among the evaluated treatment combinations which was significantly low compared to control. Microwave cooking of green gram resulted the highest AC (2031.48 ± 400.45 mol TEAC/100g DW). In chickpea, germination followed by aluminum pot cooking showed the highest TPC (266.23 ± 8.75 mg GAE/100g DW) and AC (1756.7 ± 244.4 mol TEAC/100g DW). Both parameters were significantly low compared to the control. Germination of cowpea followed by clay pot cooking resulted the highest TPC (282.54 ± 17.51mg GAE/100g), non-significant to the control. Germination followed by aluminum pot cooking resulted the highest AC (1403.82 ± 149.33 mol TEAC/100g DW), significantly lower than the control. According to the results of the study, germination followed by aluminum pot cooking could be recommended to preserve antioxidants and phenolic compounds in chickpea. Germination followed by aluminum pot cooking of cowpea and microwave cooking of raw green gram could be recommended to preserve antioxidants whereas germination followed by clay pot cooking of cowpea and soaking followed by microwave cooking of green gram could be recommended to preserve phenolic compounds.

Keywords: Antioxidants, Cooking, Legumes, Phenolic compounds, Pre-treatment