

EFFECT OF IN-VITRO DIGESTION ON ANTIOXIDANT PROPERTIES OF PROCESSED COWPEA AND MUNG BEANS

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Cowpea (*Vigna unguiculata*) and mung beans (*Vigna radiata*) are two types of legumes which are commonly consumed in Sri Lanka, due to their nutritional quality and health benefits. Antioxidants are one of the valuable bioactive compounds found in legumes. However, bioactive properties including antioxidant activity may be altered by digestion and processing. The present study investigated the effect of *in-vitro* digestion on antioxidant capacity of raw, germinated and boiled cowpea and mung beans. The total phenolic content (TPC) and total flavonoid content (TFC) in experimental samples were determined using Folin-ciocalteu method and Aluminium chloride colorimetric method, respectively. The antioxidant activity was determined using DPPH (2,2-diphenyl-1-picrylhydrazyl), ABTS (3-ethylbenzothiazoline-6-sulphonic acid) and FRAP (Ferric reducing antioxidant power) assays. The digested cowpea showed significantly ($p < 0.05$) high phenolics ($13.80 \pm 0.28 \text{ mgGAEg}^{-1}$) and flavonoids ($1.34 \pm 0.02 \text{ mgCEg}^{-1}$) than the undigested cowpea, which had $7.55 \pm 0.28 \text{ mgGAEg}^{-1}$ of phenolics and $0.77 \pm 0.02 \text{ mgCEg}^{-1}$ of flavonoids. Compared to the undigested mung beans (TFC- $0.72 \pm 0.02 \text{ mgCEg}^{-1}$, ABTS- $842 \pm 7.69 \text{ } \mu\text{mol.g}^{-1}$), the digested mung beans were shown significant ($p < 0.05$) increase in flavonoid content ($1.26 \pm 0.02 \text{ mgCEg}^{-1}$) and antioxidant activity (ABTS- $1225.3 \pm 7.69 \text{ } \mu\text{mol.g}^{-1}$). Among processing methods, boiling significantly ($p < 0.05$) reduced the phenolics ($6.46 \pm 0.35 \text{ mgGAEg}^{-1}$ of cowpea and $8.37 \pm 0.35 \text{ mgGAEg}^{-1}$ of mung beans) compared to germinated and raw beans (cowpea- $12.17 \pm 0.35 \text{ mgGAEg}^{-1}$, $13.39 \pm 0.35 \text{ mgGAEg}^{-1}$ and mung beans- $18.95 \pm 0.35 \text{ mgGAEg}^{-1}$, $16.85 \pm 0.35 \text{ mgGAEg}^{-1}$ respectively). Boiling significantly ($p < 0.05$) lower antioxidant activity (ABTS- $880.5 \pm 9.42 \text{ } \mu\text{mol.g}^{-1}$ of cowpea, $673 \pm 9.42 \text{ } \mu\text{mol.g}^{-1}$ of mung beans) compared to germinated (cowpea- $1413.9 \pm 9.42 \text{ } \mu\text{mol.g}^{-1}$, mung beans- $1121.3 \pm 9.42 \text{ } \mu\text{mol.g}^{-1}$) and raw (cowpea- $1301.3 \pm 9.42 \text{ } \mu\text{mol.g}^{-1}$, mung beans- $1306.6 \pm 9.42 \text{ } \mu\text{mol.g}^{-1}$) samples. This study reveals that, *in-vitro* digestion increased the phenolic, flavonoid content and antioxidant activity in both cowpea and mung bean samples.

Keywords: Boiled, Flavonoids, Germinated, Legumes, Phenolic, Raw