

PP 9

A comparative study on the antioxidant activity of raw and roasted seeds of *Vigna mungo* (black gram) cultivated in Sri Lanka

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Background: Bioactive compounds in plant foods have gained considerable interest in recent years for their ability to scavenge free radicals and to protect from oxidative stress. *Vigna mungo* (Black gram) is one of the common pulses in Sri Lanka which is commonly consumed after roasting in food preparations.

Objective: The present study was designed to evaluate the effect of roasting on the antioxidant activity of black gram cultivated in Sri Lanka.

Method: Whole seeds of a *Vigna mungo* cultivar known as Anuradha, were collected from Field Crops Research and Development Institute, Mahalluppallama. Distilled water extracts (20%) of raw and roasted black gram was analyzed in triplicates for Total Phenolic Content (TPC), Total Flavonoid Content (TFC), and antioxidant potential using DPPH free radical scavenging and nitric oxide scavenging. Finally, t-test was performed to find the significance level. Thin layer chromatography was performed to separate different phenolics by using gallic acid and quercetin as standards.

Results: DPPH scavenging activity of raw seed sample ($21.4 \pm 1.2 \mu\text{g/mL}$) was significantly higher ($p=0.025$) than the roasted seed sample ($13.1 \pm 0.3 \mu\text{g/mL}$). The nitric oxide scavenging activity for raw and roasted seed samples were $4.3 \pm 0.03 \text{ GAE/g}$ and $3.1 \pm 0.3 \text{ mg GAE/g}$ respectively. TPC of the raw sample was $2.5 \pm 0.05 \text{ mg GAE/g}$ and for the roasted sample it was $2.1 \pm 0.08 \text{ mg GAE/g}$. TFC for raw and roasted sample were $1.2 \pm 0.09 \text{ mg QE/g}$ and $0.2 \pm 0.01 \text{ mg QE/g}$ respectively. All the assays showed a significant difference ($p < 0.05$) between raw and roasted samples. Thin layer chromatography results indicated that gallic acid and quercetin concentration in water extract was comparatively low.

Conclusion: The present study revealed that TPC, TFC and total antioxidant potential of water extract of *Vigna mungo* is significantly reduced when black gram is roasted.