

Abstract No: MP-06

Influence of domestic cooking on the levels of bioactive compounds and antioxidant activity in green leafy vegetables

H. G. N. Dewangani and B. M. Jayawardena*

Department of Chemistry, University of Kelaniya, Sri Lanka
bimali@kln.ac.lk*

Green leafy vegetables (GLVs) are a rich source of natural antioxidants and polyphenols. These phytochemicals play an important role in the daily diet in Sri Lanka. Most GLVs are cooked prior to consumption to make GLVs more palatable and digestible. However, cooking alters the physical and chemical properties of GLVs and it may affect the levels of nutrients and bioactive compounds. In traditional meal preparations locals add scraped coconut and spices in the preparation of GLVs. Here, the effects of boiling and cooking of Asiatic pennywort (*Centella asiatica*), Manioc leaves (*Manihot esculenta*), Amaranthus (*Alternanthera sessilis*), and Sesbania (*Sesbania grandiflora*) were explored by measuring antioxidant activity (AO) and total phenolic content (TPC) of raw, boiled (6 min) and cooked ($80 \pm 10^\circ\text{C}$ for 8 min) GLVs according to the Sri Lankan domestic cooking style. Total phenolic content (TPC) and antioxidant (AO) activity of GLVs were evaluated using the Folin–Ciocalteu method and diphenyl-1-picryl-hydrazyl (DPPH) radical scavenging assay respectively. The results revealed that raw *Manihot esculenta* had the highest AO activity (0.076 ± 0.001 mg/mL) and TPC content (61.14 ± 0.04 mg GAE/g) among all the GLVs analyzed ($p < 0.001$), but shows a significant reduction ($p < 0.001$) with boiling (AO: 0.149 ± 0.001 mg/mL, TPC: 25.04 ± 0.03 mg GAE/g) and cooking treatment (AO: 0.267 ± 0.001 mg/mL, TPC: 31.95 ± 0.04 mg GAE/g). The radical scavenging activities of both raw and boiled GLVs were in the order of *Manihot esculenta* > *Alternanthera sessilis* > *Centella asiatica* > *Sesbania grandiflora*. Boiling and cooking treatments significantly reduced the TPC and AO content ($p < 0.001$). This study revealed that a 6 min boiling treatment significantly decreased ($p < 0.001$) the TPC of all GLVs studied. The AO activity of amaranthus and *Centella* was significantly improved by boiling, whereas it decreased for manioc and sesbania samples ($P < 0.001$). However, boiling caused a greater loss of AO and TPC than did cooking with scrapped coconut. The present findings suggest that the Sri Lankan style of cooking with scrapped coconut may be a better cooking method of choice to improve the health-promoting properties of GLVs by conserving the bioavailability of antioxidants and dietary polyphenols of the four leafy vegetables investigated in this study.

Keywords: Antioxidant activity, Green leafy vegetables, total phenolic content, DPPH, radical scavenging capacity

Acknowledgment

This work was supported by the Accelerating Higher Education Expansion and Development (AHEAD) Operation of the Ministry of Higher Education funded by the World Bank.