

## Antioxidant Activity of Different Varieties of Bitter Gourds (*Momordica* spp.) Cultivated in Sri Lanka

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Bitter gourd is an important functional food crop grown in low lands of Sri Lanka. It has been well recognised that people consuming diets rich in plant food are at reduced risk of developing chronic diseases, such as coronary heart disease, diabetes mellitus, cancers and neurodegenerative diseases, among others. The bioactivities present in bitter gourd are partially attributable to the antioxygenic and free radical scavenging activities. The objective of this study was to assess the total phenolic content, total antioxidant capacity (TAC) and free radical scavenging efficacy of three varieties of bitter gourd (*Momordica charantia*): *Palee*, *Matale Green* and *Thinnaweli White* and *Momordica dioica* variety *Visal* commonly known as *Thumba karawila* grown in Sri Lanka.

Bitter gourd pods were obtained from registered farm fields in Wellawaya and Grain Legume and Oil Crop Research Station, Angunakolapelessa and cultivated in *Yala* season of the year 2011. The crops were cultivated under irrigation using recommended agronomic practices of the Department of Agriculture. Water extracts of each variety were prepared and total phenolic content of extracts was determined using Folin Ciocalteu colorimetry method and expressed as mg gallic acid equivalents per gram fruit weight on wet weight basis. Free radical scavenging activity of water extract of bitter gourds was evaluated using 2, 2-diphenyl-1-picrylhydrazyl (DPPH) and TAC was also assessed.

Total phenolic content of bitter gourd varieties tested ranged between  $12.39 \pm 0.79$  and  $27.66 \pm 1.84$  mg gallic acid equivalents per 100 g fresh fruit. The highest total phenolic content was observed in *M. dioica* variety *Visal* while the lowest was observed in *Thinnaweli White*. The total phenolic content of *Palee* and *Matale Green* was intermediate and not significantly different ( $p < 0.05$ ) from each other. The concentration of extract required to scavenge 50% of DPPH radical ( $IC_{50}$  value) of bitter gourd extracts was calculated using data obtained from scavenging of DPPH radical. It was observed that the  $IC_{50}$  values of different bitter gourd varieties tested ranged from  $82.89 \pm 1.66$  to  $949.5 \pm 16.8$  mg/ml. *M. dioica* showed the highest DPPH radical scavenging efficacy ( $IC_{50} = 82.89 \pm 1.66$  mg/ml) while *Thinnaweli White* showed the lowest ( $IC_{50} = 949.5 \pm 16.8$  mg/ml). Total antioxidant capacity was determined by calculating the percentage inhibition after a lapse of 1 min. The TAC of bitter gourd varieties tested showed the following order: *M. dioica* variety *Visal* > *Palee* = *Matale Green* > *Thinnaweli White*. The total phenolic content and the  $IC_{50}$  value of all varieties tested were well correlated ( $R^2 = 0.933$ ). Furthermore, total phenolic content and TAC also showed a strong correlation ( $R^2 = 0.8937$ ).

This study showed that bitter gourd varieties tested possess strong antioxidant properties. Of the varieties tested, *M. dioica* variety *Visal* (*Thumba karawila*) possessed the highest total phenolic content and exhibited the highest DPPH radical scavenging efficacy and total antioxidant capacity while *Thinnaweli White* variety belonging to *M. charantia* showed the lowest total phenolic content, total antioxidant capacity and DPPH radical scavenging activity.