

Anti-oxidant activity and phytochemical profile of Solanaceae species in Sri Lanka

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Plant-based drugs are gaining importance due to their high potency and fewer side effects. Therefore, there is a growing interest in natural products as an alternative to conventional medications for disease treatment. In the past year, several drugs have been developed using isolated plant species, such as plant stems, roots, and fruits. This research aims to investigate the phytochemical profile and antioxidant activity of the leaves from four different *Solanaceae* species (*S. torvum*, *S. violaceum*, *S. melongena*, *S. virginianum*) extracted using water and methanol. These methanol water leaves extract have shown significant medical value with reports suggesting anti-tumor and anti-cancer effects. DNA barcoding using the matK locus was assessed for routine specimen identification. However, polymorphism in the matK locus is not diverse enough to set the species limit of the genotype within *S. melongena*. And *Thiththathibbatu* (*S. violaceum*) and *Walthibbatu* (*S. pubesens*) had a similar haplotype as well. Qualitative analysis was conducted to detect phytochemicals, such as alkaloids and, flavonoids, using standard methods. Folin-ciocalteau method, aluminum chloride colorimetric method, and phosphor-molybdenum assay were employed to determine Total Phenol Content, Total Flavonoid Content, and Total Antioxidant Capacity respectively. The antibacterial activity was evaluated using the well diffusion technique against *Escherichia coli* (*E. coli*) and *Staphylococcus aureus* (*S. aureus*). Free radical scavenging activity of water and methanol extracts was determined using DPPH (2,2-Diphenyl-1-picrylhydrazyl). Correlation coefficient was calculated using TPC, TAC, and TFC data based on water and methanol samples separately. Significant differences were determined by performing t-test. Analysis in data beyond anti-bacterial activity against *E. coli* and *S. aureus* was carried out by ANOVA. Methanol extract of *S. viginianum* exhibited the highest antibacterial activity against *S. aureus*. In conclusion, methanol is more effective for extracting active phytochemicals from *Solanaceae* species. However, only a few of these species are currently cultivated locally and have yet to enter the international market.

Key words: Anti-oxidant activity, Flavonoid, IC50 value, matK, Phenolic compounds

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