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Antioxidant and antimicrobial activity of flower and leaf extracts of *Calotropis gigante*

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Calotropis gigantea is latex bearing medicinal plant belonging to the family Apocynaceae. Two forms of *C. gigantea*; white-flowered form and purple-flowered form can be found native to Sri Lanka. The objectives of the current study were to investigate the antioxidant activity and antimicrobial activity of methanolic extracts of the leaves and flowers of both white-flowered and purple-flowered forms of *C. gigantea*. The antioxidant assay was carried out by DPPH free radical scavenging method. The antimicrobial assay was determined by an antimicrobial susceptibility test against E-coli, *Staphylococcus aureus*, and *Candida albican*s. The flower extracts possessed significant antioxidant activity (Inhibition percentage is 90.58 ± 0.57) compared with the positive control Ascorbic acid (Inhibition percentage is 97.47 ± 0.08) While the purple-flowered form showed a lower IC_{50} value (820.20 ppm) than the white-flowered form (875.13 ppm). *C. gigantea* showed a significantly higher zone of inhibition against *Candida albicans* (14.76 ± 0.72 mm) followed by E-coli (14.01 ± 0.50 mm) and *Staphylococcus aureus* (13.24 ± 0.75 mm). The findings of the study suggest that the *C. gigantea* is an important medicinal plant which should be further investigated for its antioxidant and antimicrobial potential.

Keywords:
Calotropis gigantea, Antioxidant, Antimicrobial

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Development and validation of a multi residue method for analysis of pesticide residues in fruits and vegetables with liquid chromatography tandem mass spectroscopic (LC-MS/MS) detection

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Fruit and vegetables are an important part of the diet of humans, and pesticides are used to control pests and weeds in agriculture. Since pesticide contamination in commodities which are used for human consumption above the tolerance limit can lead to serious health problems, it is crucial to understand the extent of contamination in fruit and vegetables. During this study, three commodities were taken to validate a method for multi-residue analysis: cucumber, lime, and mixed fruit jam, which belong to three categories such as those with high water content, high acid content with high-water content, and high sugar content with low water content, respectively for the residues of 6 pesticides. A modified quick, easy, efficient, cheap, rugged, and safe (QuEChERS) method was used for the preparation of samples followed by LC-MS/MS technique in electron spray ionization (ESI) mode with positive polarity for the analysis. Multiple-reaction monitoring (MRM), which measures the qualifier to quantifier mass fragment ratios, was utilized to verify the specificity for each pesticide using MS/MS detection. The accuracies were assured through percentage recoveries until the laboratory participates in the proficiency testing program. The regression analysis has shown coefficient values greater than 0.995 obtained with six calibration levels tested to achieve acceptable linearities. The pesticides, tolfenpyrad, difenoconazole, hexythiazox, bitertanol, propargite, and flufenoxuron have shown recoveries between 70% and

120% for all the spiking concentration levels, 8 ppb, 40 ppb and 80 ppb. The precision of the method was assured by relative standard deviation values (RSD) obtained below 20% for all the pesticides. The limit of detection (LOD) and the limit of quantification (LOQ) of the method were 0.001 and 0.005 mg/kg respectively, and the method was found to be robust over different matrices. Hence, the method can be regarded as accurate and reproducible for the analysis of pesticide residues in a wide range of fruit and vegetables.

Key words:
LC-MS/MS, Modified QuEChERS, Method validation, Fruit and Vegetables

Abstract No: 2023_17

Quantitative analysis of curcumin content of turmeric (*Curcuma longa* L.) grown in four locations of Sri Lanka by HPLC analysis

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The objective of this study is quantification of curcumin content in turmeric from four distinct locations in Sri Lanka. *Curcuma longa* L. belongs to the Zingiberaceae family. Curcumin, a bright orange-yellow color pigment of turmeric consists of a mixture of three curcuminoids namely- curcumin, demethoxycurcumin, and bisdemethoxycurcumin.. Curcumin was isolated and purified through preparative TLC followed by HPLC analysis to determine the purity of curcumin. Purified curcumin was used as a standard for HPLC analysis. Also purified standard was compared with curcumin analytical standard (Fluka /Assay 97%) and confirmed as curcumin. The Soxhlet extraction of each sample was investigated using an HPLC method. HPLC analysis was performed on a C18 column using 2% glacial acetic acid (GAA), and 100% acetonitrile with UV Spectroscopy detection at 425 nm. Further, moisture content and oil content were analyzed for each sample. The average moisture content and oil content of the dried turmeric samples were recorded as 30.5 and 34.2 respectively. The curcumin content of the four authentic samples was 1.49 ± 0.25^{d}, 4.25 ± 0.23^{a}, 2.26 ± 0.21^{c} and 2.96 ± 0.22^{b}. There was a significant difference between location and curcumin content at alpha 0.0001. The highest curcumin content was reported in Ingiriya are making 4.25 ± 0.23^{a}. According to the study, the curcumin content of turmeric samples collected from Kalutara, Ingiriya, Kuliyapitiya, and Meepe has changed significantly with their geographical locations. Likewise, further studies can be carried out for commercial samples of turmeric as well. Curcumin extracted from turmeric can be utilized to manufacture gel capsules and other nutraceuticals as value-added products.

Keywords:
Curcumin, Curcuminoids, Preparative Thin Layer Chromatography, Glacial acetic acid (GAA).