

IN VITRO ANTIOXIDANT, CYTOTOXIC, PHYTOTOXIC AND α -AMYLASE INHIBITORY POTENTIAL OF FOUR SRI LANKAN MEDICINAL PLANTS

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Plants are rich in secondary metabolites that have many physiological effects. This study determined the bioactivities of four widely distributed plants in Sri Lanka. Leaves of *Canna indica* (Cannaceae/Buthsarana), *Muntingia calabura* (Muntingiaceae/Jam), *Piper betle* (Piperaceae/Nagawalli) and *Pongamia pinnata* (Leguminosae/ Karada) were collected from Kandy, Sri Lanka. They were shade-dried, ground and extracted into methanol by sonication. The antioxidant potential of crude extracts was determined by 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging and ferric reducing antioxidant power (FRAP) assays, antidiabetic activity by α -amylase inhibitory assay, cytotoxicity by brine shrimp lethality assay and phytotoxicity by the lettuce seed germination assay. The results revealed that *M. calabura* has a strong antioxidant potential (IC_{50} 6.84 ± 0.12 mg/L) compared to the positive control, ascorbic acid (IC_{50} 1.97 ± 0.06 mg/L). The IC_{50} values of *C. indica*, *P. betle* and *P. pinnata* were 1085.72 ± 100.5 mg/L, 49.86 ± 3.15 mg/L and 182.92 ± 21.34 mg/L respectively. When compared to the positive control, Trolox (12.07 ± 0.30 $\mu\text{mol/dm}^3$ FeSO_4/g), none of the crude extracts resulted in high FRAP values ranging between $0.2 - 1.8$ $\mu\text{mol/dm}^3$ FeSO_4/g . In α -amylase inhibitory assay, leaves of *M. calabura* resulted in an IC_{50} of 84.43 ± 2.32 mg/L with no significant difference with positive control, acarbose (IC_{50} 45.99 ± 3.97 mg/L). The IC_{50} values of *P. betle* and *P. pinnata* were 796.00 ± 43.67 mg/L and 1394.94 ± 101.23 mg/L, while no activity was detected for *C. indica*. In the brine shrimp lethality assay, *M. calabura*, *P. betle*, and *P. pinnata* showed LC_{50} of 540.01 ± 6.76 mg/L, 856 ± 14.72 mg/L and 771.04 ± 8.55 mg/L, respectively, while *C. indica* resulted in 0% lethality. Whereas the positive control, $\text{K}_2\text{Cr}_2\text{O}_7$, resulted in LC_{50} 35.16 ± 4.22 mg/L. In the phytotoxicity assay, the IC_{50} for root inhibition of *M. calabura*, *C. indica*, *P. betle* and *P. pinnata* were 319.21 ± 10.35 mg/L, 63.9 ± 4.30 mg/L, 70.98 ± 1.42 mg/L and 297.59 ± 8.97 mg/L respectively. The IC_{50} of shoot inhibitions were 704.72 ± 9.92 mg/L, 265.09 ± 12.57 mg/L, 178.13 ± 8.87 mg/L and 470.78 ± 14.62 mg/L respectively. The positive control, abscisic acid, had a root inhibition of 0.29 ± 0.03 mg/L and shoot inhibition of 0.25 ± 0.01 mg/L. These results revealed that *M. calabura* crude extract has strong antioxidant and antidiabetic activity, and *C. indica* leaves have strong root inhibition potential.

Keywords: Anti-diabetic activity, Antioxidant activity, *Canna indica*, *Muntingia calabura*, Phytotoxicity