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Evaluation of biological potentials of *Achyranthes aspera L.*, *Santalum album L.* and *Withania somnifera L.*

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Plants have been the major source of drugs to treat different kinds of diseases like cancers and diabetes in traditional medicine. *Achyranthes aspera*, *Santalum album* L and, *Withania somnifera* are commonly used medicinal plants in Sri Lanka. This study evaluates the biological activities of outlined plants. Plants were collected from the Central province of Sri Lanka. The leaves were air-dried, ground, and extracted with 100% methanol by sonicating for 30 minutes. The plant extracts were assessed for antioxidant activity using 2,2-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging assay, Ferric Reducing Antioxidant Power (FRAP) assay, enzyme inhibitory activity against α-amylase, brine shrimp lethality assay and phototoxicity against germination of lettuce seeds. All the bioassays were conducted within the concentration range of 31.25-1000 mg L^{-1}. Among the plant extracts, *A. aspera* demonstrated the highest DPPH radical scavenging ability (IC_{50} = 194.84 ± 7.004 mg L^{-1}), followed by *S. album* (IC_{50} = 199.93 ± 2.27 mg L^{-1}) and *W. somnifera* (IC_{50} = 927.13 ± 10.9 mg L^{-1}). However, the values obtained were higher than the positive control ascorbic acid IC_{50} value (1.97 ± 0.06 mg L^{-1}). In the FRAP assay, all the extracts showed lower FRAP values compared to the positive control; trolox (12.07 ± 0.30 µmol dm^{-3} of $FeSO_4$/g). In the brine shrimp lethality assay, only *S. album* showed lethality with an LC_{50} value of 509.281 ± 0.89 mg L^{-1} which was higher than the positive control $K_2Cr_2O_7$ (LC_{50} 35.16 mg L^{-1}). None of the plant extracts showed α-amylase inhibitory activity and phytotoxicity within the tested concentration range. In conclusion, *A. aspera* exhibited the highest antioxidant activity in the DPPH assay, though less potent than ascorbic acid. All extracts showed lower ferric-reducing power and α-amylase inhibitory activity. Only *S. album* demonstrated cytotoxicity in the brine shrimp assay, albeit weaker than the positive control.

Keywords*: α-Amylase, cytotoxicity, DPPH, FRAP, phytotoxicity*