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In vitro antioxidant, cytotoxic, and phytotoxic potential of some Sri Lankan medicinal plants

D. Pasqual[1], W.W.M.T.R. Wekadapola[1], J. Kalinga[1], U. Siriwardhane[1], N.P. Piyasena[1], N.K.B. Adikaram[1], J.M.N. Marikkar[1], L. Jayasinghe[1*]

[1]*National Institute of Fundamental Studies, Kandy, Sri Lanka*

[*]*ulbj2003@yahoo.com*

This study aims to determine the antioxidant potential, cytotoxicity, and phytotoxicity of medicinally important *Alpinia calcarata* rhizome ('Araththa'), *Sida alnifolia* leaves ('Babila') and *Tinospora cordifolia* stem ('Rasakinda'). Firstly, these plants were collected, cleaned, air-dried, and ground into fine powders. They were extracted into methanol by sonication and evaporated to dryness. The crude extracts were tested for antioxidant activity by the 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging assay, phytotoxicity by the lettuce seed germination assay, and cytotoxicity by brine shrimp lethality assay. The results of the DPPH radical scavenging assay showed that *A. calcarata* exhibited a strong antioxidant potential with an IC_{50} of 34.53 mg L^{-1} followed by *T. cordifolia* (IC_{50} 130.47 mg L^{-1}) and *S. alnifolia* (179.23 mg L^{-1}) compared to positive control ascorbic acid IC_{50} 1.90 ± 0.01 mg L^{-1}. For the brine shrimp lethality assay positive control $K_2Cr_2O_7$ showed LC_{50} of 34.40 ± 0.30 mg L^{-1} whereas *A. calcarata* and *T. cordifolia* resulted in moderate cytotoxicity with LC_{50} of 249.99 mg L^{-1} and 275.57 mg L^{-1} respectively. The root elongation inhibition resulted in the lettuce seed assay can be aligned as *T. cordifolia* (IC_{50} 172.46 mg L^{-1}), *A. calcarata* (IC_{50} 635.02 mg L^{-1}) and *S. alnifolia* (IC_{50} 1322.83 mg L^{-1}). Whereas, their shoot elongation inhibition can be aligned as *S. alnifolia* (IC_{50} 193.35 mg L^{-1}), *A. calcarata* (IC_{50} 420.17 mg L^{-1}), and *T. cordifolia* (IC_{50} 1317.52 mg L^{-1}). However, none of them showed strong root or shoot elongation inhibition potentials as positive control; abscisic acid which resulted IC_{50} 1.46 ± 0.19 mg L^{-1} and 1.85 ± 0.31 mg L^{-1} for root and shoot elongation inhibitions respectively. Based on these findings, it can be concluded that *A. calcarata* rhizome extract contains a remarkable antioxidant potential and moderate cytotoxicity similar to *T. cordifoli. T. cordifolia* and *S. alnifolia* extracts have moderate phytotoxicity against root and shoot elongation respectively.

Keywords: *Alpinia calcarata, DPPH, Sida alnifolia, Tinospora cordifolia*