NIFS NIFS-YSA

Scientia et Innovatio: Vision to Venture

YSCMR 2025

Proceedings of the

YOUNG SCIENTISTS' CONFERENCE ON MULTIDISCIPLINARY RESEARCH

VIRTUAL INTERNATIONAL CONFERENCE

2025

Organized by
The Young Scientists' Association
National Institute of Fundamental Studies, Sri Lanka.

ISSN 2815-0260
Proceedings of the Young Scientists' Conference on Multidisciplinary Research-2025
Young Scientists' Association, National Institute of Fundamental Studies, Sri Lanka
27th November 2025

Paper ID: CMT_35

Bioactivity assessment of methanolic extract of *Murraya paniculata* and *Alpinia calcarata* plant leaves: Antioxidant, Cytotoxic, and Phytotoxic potential

R.H.V.C. Herath[1,2], H.A.K.D. Premasiri[1], K.G. Nelum Piyasena[1*], D.S. Jayaweera[1], N.K.B. Adikaram[1], L. Jayasinghe[1]

[1]*National Institute of Fundamental Studies, Kandy, Sri Lanka*
[2]*University of Ruhuna, Matara, Sri Lanka*

[*] *nelum.pi@nifs.ac.lk*

Traditional medicinal plants are valuable sources of bioactive compounds with potential therapeutic and environmental applications. This study investigated the antioxidant, cytotoxic, and phytotoxic properties of methanolic leaf extracts from *Murraya paniculata (*Etteriya*)* and *Alpinia calcarata* (Araththa). *A. calcarata* and *M. paniculata* plants were selected due to their use in traditional Sri Lankan medicine for treating wounds, digestive disorders, and respiratory issues, suggesting the presence of bioactive compounds. This study provides insights into the bioactivity of these two plant species, adding to the limited data on their antioxidant and cytotoxic properties. Antioxidant capacity was assessed using the 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging assay and the Ferric Reducing Antioxidant Power (FRAP) assay. In the DPPH assay, *A. calcarata* exhibited stronger radical scavenging activity (IC_{50} = 68.58 ± 5.76 µg/mL) than *M. paniculata* (IC_{50} = 132.16 ± 10.45 µg/mL), although both were less potent than the positive control, ascorbic acid (IC_{50} = 7.90 ± 0.10 µg/mL). The differences observed between the two extracts were statistically significant ($p < 0.05$). FRAP values further supported the antioxidant potential, with *A. calcarata* and *M. paniculata* demonstrating values of 671.77 ± 21.25 and 578.46 ± 6.22 µmol Fe^{2+}/g, respectively, compared to Trolox (17679.67 ± 505.58 µmol Fe^{2+}/g). Cytotoxicity, evaluated via the brine shrimp lethality assay, indicated moderate toxicity, with LC_{50} values of 199.14 ± 17.51 µg/mL for *A. calcarata* and 168.17 ± 8.52 µg/mL for *M. paniculata* compared to the positive control potassium dichromate (LC_{50} = 7.97 ± 0.97 mg L^{-1}). Phytotoxicity analysis revealed no inhibitory effects on lettuce seed (*Lactuca sativa*) germination. Notably, *A. calcarata* extract appeared to promote seedling growth, indicating potential plant growth-stimulating properties. These findings suggest that both *M. paniculata* and *A. calcarata* possess notable antioxidant activity and moderate cytotoxic potential, supporting their relevance in pharmaceutical research. Additionally, the observed growth-promoting effects of *A. calcarata* warrant further investigation for possible agricultural applications. Continued studies are recommended to isolate and characterize the specific bioactive constituents responsible for these effects.

Keywords: *Bioactivity, DPPH, FRAP, lettuce seed germination*