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YSCMR 2025

YOUNG SCIENTISTS' CONFERENCE ON MULTIDISCIPLINARY RESEARCH- NIFS

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_118

Antioxidant and antidiabetic activities of hot water extracts of unripe *Musa paradisiaca* and *Doona macrophylla* Thwaites

U.I. Hettiarachchi[1,2,3], H.A.K.D. Premasiri[1], M.T. Napagoda[3], K.G. Nelum P. Piyasena[1*], N.K.B. Adikaram[1], L. Jayasinghe[1]

[1]*National Institute of Fundamental Studies, Kandy, Sri Lanka*
[2]*Genetics and Molecular Biology Unit, Faculty of Applied Sciences, University of Sri Jayewardenepura, Sri Lanka*
[3]*Department of Biochemistry, Faculty of Medicine, University of Ruhuna, Sri Lanka*

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

Musa paradisiaca (ash plantain), a member of the Musaceae family, has been utilized as a food source and in traditional medicinal practices across various cultures. *Doona macrophylla* Thwaites (maha beraliya) is an endemic flowering plant to Sri Lanka. This study primarily aims to evaluate the biological activities of the edible parts of *M. paradisiaca* and *D. macrophylla*, as current literature offers limited data on their bioactivity when consumed in forms consistent with traditional dietary practices. The fresh edible parts of *M. paradisiaca* and the dried seeds of *D. macrophylla* were washed, cut, or ground, then boiled with hot water at 100 °C for 15 minutes in a hot water bath and freeze-dried. The antioxidant properties of crude extracts were determined by *2,2-diphenyl-1-picrylhydrazyl* (DPPH) radical scavenging and Ferric Reducing Antioxidant Power (FRAP) assays. The assays were conducted in a concentration range of 31.25 – 1000 mg L^{-1}. According to the DPPH assay results, *M. paradisiaca* peel (IC_{50} 29.928±11.431 mg L^{-1}) and *D. macrophylla* (IC_{50} 32.88±2.98 mg L^{-1}) showed strong antioxidant activity, while *M. paradisiaca* fruit (IC_{50} 1542.10±131.63 mg L^{-1}) had weak antioxidant activity compared to the positive control, ascorbic acid (IC_{50} 7.90×10^{-3}±0.10 mg L^{-1}). In the FRAP assay, all the crude extracts: *M. paradisiaca* peel ($7.64\pm0.11\times10^{3}$ µmol Fe^{2+}/g), fruit ($5.32\pm0.17\times10^{3}$ µmol Fe^{2+}/g), inflorescence ($6.54\pm0.19\times10^{3}$ µmol Fe^{2+}/g), and *D. macrophylla* ($7.00\pm0.10\times10^{3}$ µmol Fe^{2+}/g) exhibited bioactivity compared to the positive control, Trolox ($17.68\pm0.51\times10^{3}$ µmol Fe^{2+}/g). The antidiabetic potential was evaluated using the α-amylase inhibition assay at 1000 mg L^{-1}. The highest percentage inhibition was observed in *M. paradisiaca* fruit (69.09±3.07%), while *M. paradisiaca* peel (67.96±7.81%) and *D. macrophylla* (64.41±3.72%) exhibited bioactivity compared to acarbose (57.51±4.33%). In conclusion, *M. paradisiaca* peel showed strong, and fruit showed weak antioxidant potential as evidenced by DPPH and FRAP assays. All crude extracts showed inhibition potential against the α-amylase enzyme at 1000 mg L^{-1}.

Keywords: *α-amylase inhibition, bioactivities, DPPH, food, frap*