Proceedings of the

YSCMR 2022

VIRTUAL INTERNATIONAL CONFERENCE 2022

YOUNG SCIENTISTS' CONFERENCE ON MULTIDISCIPLINARY RESEARCH

November 10, 2022

ORGANIZED BY THE YOUNG SCIENTISTS' ASSOCIATION, NATIONAL INSTITUTE OF FUNDAMENTAL STUDIES, SRI LANKA



NIFS-YSA

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ISSN 2815-0260



Proceedings of the Young Scientists' Conference on Multidisciplinary Research-2022 Young Scientists' Association, National Institute of Fundamental Studies, Sri Lanka weam - 2022 10th November 2022

> Paper ID: CMT-089

Bioactive metabolite of endophytic fungus from Manihot esculenta

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Fungi are among the most important organisms in the world because of their very important roles in ecosystem functions and power on humans and human-related activities. Since the discovery of penicillin, natural product discovery from fungi has added considerable attention and force. Plant endophytic fungi have been recognized as an important source of natural products with potential applications in industries. In this paper, the chemistry and bioactivity of endophytic fungi in leaves of *Manihot esculenta* were investigated to find the possible application in health and agriculture. Triple sterilized leaf segments of *M. esculenta* were placed on Potato Dextrose Agar (PDA) medium and incubated at room temperature to obtain endophytic fungi. The identification of endophyte is in progress. The pure culture of endophyte was fermented in 12 L of Potato Dextrose Broth (PDB) medium. The medium was filtered and the filtrate was extracted with ethyl acetate (EtOAc) and residual mycelium was extracted using EtOAc and methanol (MeOH). The combined EtOAc extract was chromatographed over silica gel (n-hexane-EtOAc-MeOH) followed by PTLC to give 5methylmellein (1), 6-O-methylreticulol (2), 7-hydroxy-5-methylmellein (3) and saccharonol B (4). With availability of compounds, only 1 was screened for antifungal activity against Cladosporium cladosporioides, phytotoxicity (lettuce seed germination assay), antioxidant activity using DPPH, brine shrimp toxicity (Artemia salina) and enzyme inhibitory assays on, α -glucosidase, acetylcholinesterase and lipase. Compound **1** showed brine shrimp lethality at LC₅₀- 10.11 mg l⁻¹ and strong antioxidant activity against DPPH at IC₅₀- 0.23 mg l^{-1} . It displayed the shoot inhibition of lettuce seedlings at IC50- 82.53 ppm while root inhibition of lettuce seedlings at IC50- 137.47 ppm. The mild acetylcholinesterase enzyme inhibitory activity was observed at IC₅₀- 815.32 mg l

¹ and the antifungal activity against *C. cladosporioedes* was observed. Therefore, endophytic fungus from *M. esculenta* can be considered a potential source for the isolation of new therapeutic agents.

Keywords: Antifungal, antioxidant, cytotxicity, Manihot esculenta, phytotoxicity