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

FS

ISSN 2815-0260



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

> Paper ID: CMT-105

Bioactivity of different crude extracts of Salicornia brachiata

<u>H.M.N.P. Herath</u>¹, M.N.F. Ifadha², D. Perera², N.K.B. Adikaram¹, L. Jayasinghe^{1*} ¹National Institute of Fundamental Studies, Kandy, Sri Lanka

²Department of Bioprocess Technology, Rajarata University of Sri Lanka, Mihintale, Sri Lanka

*lalith.ja@nifs.ac.lk

Salicornia brachiata is a halophytic herb which can be found primarily in salt marshes. It is commercially grown for food, feed, oil seed, pharmaceutical, and nutraceutical purposes in many regions of the world. Chemically, a wide variety of secondary metabolites of economic interest have been previously reported in many Salicornia species worldwide. We screened the bioactivity of extracts of a locally available Salicornia brachiata: air-dried and powdered shoots sequentially extracted into nhexane (NH/S/Hs), ethyl acetate (NH/S/Es), and methanol (NH/S/Ms) and roots extracted into the same types of solvents respectively (NH/S/Hr, NH/S/Er, and NH/S/Mr). The extracts were evaluated for antioxidant activity (using 1,1-diphenyl-2picrylhydrazyl [DPPH]), total phenolic content (TPC) (using Folin-Ciocalteau reagent), cytotoxicity (using the brine shrimp lethality assay), antifungal-activity (against *Cladosporium cladosporioides*), and phytotoxicity (against *Lactuca sativa*). NH/S/HS showed very low antioxidant properties (DPPH, 861 mg l⁻¹), contained very low TPC $(7.14 \pm 4.91 \text{ mg GAE/g})$ and mildly toxic $(100 < \text{LC50} \le 500 \text{ µg ml}^{-1})$. NH/S/Hr displayed low anti-oxidant (DPPH, IC₅₀ 523 ± 2 mg l⁻¹) properties and, highly toxic $(LC_{50} \le 12 \ \mu g \ ml^{-1})$. NH/S/Es displayed strong antioxidant properties (DPPH, IC₅₀ 137 $\pm 4 \text{ mg l}^{-1}$; contained high TPC (32.12 $\pm 7.04 \text{ mg GAE/g}$), however, displayed higher toxicity (LC₅₀ > 0 µg ml⁻¹). NH/S/Er moderate antioxidant (DPPH, IC₅₀ 173 $\pm 29 \text{ mg l}^{-1}$ ¹) and inhibited C. cladosporioides. NH/S/Ms showed law antioxidant properties (DPPH, IC₅₀ 412 \pm 112 mg 1⁻¹), but displayed low toxicity (500 < LC₅₀ μ g ml⁻¹). NH/S/Mr is moderate antioxidant (DPPH, IC₅₀ 175 \pm 30 mg 1⁻¹); contain high TPC $(29.00 \pm 15.81 \text{ mg GAE/g})$; moderately toxic $(12 < LC_{50} \le 100 \ \mu g \text{ ml}^{-1})$ and showed antifungal activity. The S. brachiata extracts were negative for phytotoxicity in root and shoot inhibition. S. brachiata extracts examined here are potential sources for developing safe antioxidants.

Keywords: Antioxidant, antifungal, cytotoxicity, phytotoxicity, total phenolic content

Acknowledgement: Asian Development Bank (through Science and Technology Human Resource Development Project, Ministry of Education) [ADB STHRDP] is acknowledged for financial support