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Metabolites profiling and antimicrobial activities in roots and leaves of neptunia oleracea

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Abstract

Neptunia oleracea (N. oleracea) or known as water mimosa is a local aquatic plant that has been widely used in food recipes. Besides the taste, it is reported to have therapeutic values in reducing diseases such as diabetes mellitus, inflammation and fever. However, the justification of N. oleracea practice have not been extensively supported by published studies hence, the aim of this research is to identify the metabolites of leaves and roots of N. oleracea, investigate the antioxidant and antimicrobial activity in the leaves of N. oleracea. The leaves and roots of N. oleracea were separated and extracted using methanol as solvent. Qualitative studies were done using Thin Layer Chromatography (TLC) and Nuclear Magnetic Resonance (NMR) analysis. Meanwhile phytochemical screenings were carried out in identification of reducing sugar, alkaloids, glycosides, flavonoids, protein, terpenoids, phytosterols, and tannins in the samples. Investigation of antimicrobial activity of leaves of N. oleracea with concentration of 10mg/ml, 50mg/ml and 100 mg/ml was done against Staphylococcus aureus, Escherichia coli, Pseudomonas aeruginosa and Candida albicans to provide insights of this study. TLC results shows the leaves and roots of N. oleracea extracted constituted of polar compounds and phytochemical screening reveals presence of flavonoids in leaves and roots extract of N. oleracea while tannins and alkaloids only found the in leaves extract of N. oleracea. NMR spectroscopy showed presence of compound at aliphatic and sugar region for both leaves and roots extract of N. oleracea while presence of peak at the aromatic region only seen in leaves extract of N. oleracea. Antimicrobial study reveals significance ($p < 0.05$) activity against C. albicans only in leaves. Presence of certain metabolites in N. oleracea may contributes to its antimicrobial and antioxidant activities that beneficial in managing and preventing development of diseases. © 2020, Advanced Scientific Research. All rights reserved.

Author Keywords

Antimicrobial Activity; N. Oleracea; NMR; Phytochemical Screening; TLC

Index Keywords

alkaloid, flavonoid, glycoside, neptunia oleracea extract, phytosterol, plant extract, protein, sugar, tannin, tannin derivative, terpenoid, unclassified drug; agar diffusion, antimicrobial activity, Article, Candida albicans, controlled study, data analysis, disk diffusion, drug screening, Escherichia coli, information processing, infrared spectroscopy, Klebsiella pneumoniae, medicinal plant, metabolic fingerprinting, metabolite, minimum inhibitory concentration, neptunia oleracea, nonhuman, nuclear magnetic resonance spectroscopy, plant leaf, plant root, proton nuclear magnetic resonance, Staphylococcus aureus, thin layer chromatography, zone of inhibition

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