



Phytochemical Screening and In-vitro Antioxidant Properties of *Xylocarpus granatum* Leaves from Sri Lankan Mangrove Ecosystems

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One of the true mangrove species *Xylocarpus granatum* is found in the Northern, northeastern and Southern part of Sri Lanka. Previous studies have focused on its seeds and bark. This study emphasizes antioxidizing properties and qualitative phytochemical properties of *X. granatum* leaves. Matured healthy leaves were air-dried for three weeks and extracted twice using methylene chloride and twice again using methanol and the combined crude extracts were sequentially partitioned by solvent polarity into distilled water, n-butanol (N-BuOH), 85% aqueous methanol (85% aq.MeOH), and n-hexane fractions. Antioxidant property was assessed by the 2,2-diphenyl-1-picrylhydrazyl (DPPH) assay. The ascorbic acid standard control achieved the highest performance with a Radical Scavenging Activity (RSA) of 89.02%. Among the extract preparations, the methanol fraction exhibited the strongest antioxidant potency with an RSA of 81.06%, followed by the crude extract at 74.64% and the 85% methanol fraction at 72.61%. The n-hexane and butanol fractions exhibited the lowest relative antioxidant potential with moderate RSAs of 68.26% and 65.27%, respectively. These results indicate that the polar solvent fractions, particularly methanol, possess a strong capacity to donate hydrogen or electrons, effectively neutralizing free radicals. Additionally, qualitative phytochemical screening was performed across the crude extract and its fractions to detect the presence of bioactive secondary metabolites. By mapping the antioxidant capacity and qualitative phytochemical profile of these specific leaf fractions, this study revealed a rich presence of lipophilic and sugar-conjugated secondary metabolites. The extract tested strongly positive for saponins (stable foam formation), steroidal rings via Salkowski's test (reddish-brown interface), and steroidal nuclei via Liebermann's test. Additionally, the presence of cardiac glycosides was distinguished by the brown interphase ring formed in the Keller-Kilani test, while a positive indication for terpenoids in *X. granatum* leaves play a vital role as polar radical scavenging antioxidants and bioactive compounds for future pharmacological innovations.

Keywords: *Xylocarpus granatum*, Bioactive compounds, Antioxidants, Phytochemical screening