

Screening the Radical Scavenging Activities of the Solvent Extracts from Brown Marine Algae: *Padina commersonii*

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Abstract

Padina commersonii is a marine brown macroalgae commonly found in Sri Lankan water. It is showing remarkable therapeutic potential due to comprising of a rich source of natural products. This study aimed to evaluate antioxidant activity in terms of the radical scavenging activity of *P. commersonii*. In this study, freeze-dried *P. commersonii* was subjected to three hours of sonication in 80% methanol. By precipitating with ethanol, the de- polysaccharide fraction of methanolic crude was isolated. The de- polysaccharide fraction in the methanolic extract was then fractionated by liquid-liquid partitioning into hexane, chloroform, ethyl acetate, and water. The existing phytochemicals and the bioactivities of the separated fractions were analyzed. The highest Total polyphenolic content (TPC) was observed in the Ethyl acetate fraction (7.44 ± 0.29 mg GAE/g). Radical scavenging activities including 2,2-diphenyl-1-picrylhydrazyl (DPPH), hydroxyl, and alkyl were performed to investigate the antioxidant activities. Ethyl acetate fraction exhibited the lowest IC₅₀ values for DPPH (0.71 ± 0.03 mg/ml), alkyl (0.017 ± 0.001 mg/ml), and hydroxyl radicals (0.25 ± 0.01 mg/ml) while proving superior radical scavenging performance in comparison to other fractions. Ethyl acetate fraction was further fractionated through a reverse phase Octadecyltrimethoxysilane (ODS) open column followed by the Thin Layer Chromatography (TLC) studies. Resulted in four fractions which were evaluated for radical scavenging activity and the lowest IC₅₀ values for DPPH (0.014 ± 0.001 mg/ml), alkyl (0.010 ± 0.001 mg/ml), and hydroxyl radicals (0.100 ± 0.003 mg/ml) were found in fraction-2 (F2). Collectively, the findings have showed that free radical scavenging activity has a positive correlation with the TPC of the ethyl acetate fraction. Furthermore, the F2 fraction was collected as the best fraction with antioxidant activity and required further purification to isolate and characterize the polyphenolic compounds which are responsible for the antioxidant activity. This research might be effective to find possible lead compounds from *P. commersonii* for drug discovery as well as for the development of future therapeutic medication.

Keywords: *Padina commersonii*, Brown algae, Antioxidant activity, Radical scavenging activity, Polyphenols