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Evaluation of Antioxidant Activity of Selected Seaweeds in Southern Province, Sri Lanka

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Background: Seaweeds are marine macro-algae known for their rich content of bioactive compounds, including antioxidants. Although *Ulva lactuca* and *Sargassum filifolium* have been previously studied in Sri Lanka, their antioxidant potential remains underexplored using the specific assay methods employed in this study.

Objective: This study investigates the antioxidant activity of *Ulva lactuca* (green algae) and *Sargassum filifolium* (brown algae) using two complementary assays. DPPH radical scavenging and reducing power (RP) to evaluate the efficacy of different solvent extractions

Methods: The crude extraction from each dried seaweed sample were obtained using sequential cold maceration was performed using hexane, ethyl acetate, and methanol. Extract concentrations ranged from 0.25 mg/ml to 2.0 mg/ml. Absorbance was measured at 517 nm for DPPH and 700 nm for RP assays. Each experiment was conducted in triplicate, and IC₅₀ values were calculated using nonlinear regression (p < 0.05), with ascorbic acid serving as the reference standard.

Results: In the DPPH assay, *Ulva lactuca* methanol extract (IC₅₀ = 0.020 mg/ml) showed the highest radical scavenging activity, followed by *Sargassum filifolium* ethyl acetate extract (IC₅₀ = 0.025 mg/ml), both significantly outperforming ascorbic acid (IC₅₀ = 6.180 mg/ml). Moderate activity was observed in *Ulva lactuca* hexane (0.704 mg/ml) and ethyl acetate (1.024 mg/ml), and in *Sargassum filifolium* hexane (0.080 mg/ml) and methanol (0.272 mg/ml). In the RP assay, *Ulva lactuca* hexane extract (IC₅₀ = 0.221 mg/ml) exhibited the strongest reducing power, followed by *Sargassum filifolium* ethyl acetate (0.293 mg/ml), both superior to ascorbic acid (1.182 mg/ml). Other extracts showed comparable activity: *Ulva lactuca* ethyl acetate (0.474 mg/ml), methanol (0.387 mg/ml); *Sargassum filifolium* hexane (0.507 mg/ml), methanol (0.380 mg/ml).

Conclusion: This study highlights the solvent-dependent extraction of antioxidant compounds, with methanol and ethyl acetate favoring polar bio-actives and hexane retaining non-polar compounds with strong reducing power. The findings underscore the novel antioxidant potential of *Ulva lactuca* and *Sargassum filifolium* from Southern Sri Lanka, supporting their application in different industries.

Keywords: DPPH assay, IC₅₀ value, RP assay