Characterization of Five Selected Seaweed Species in Sri Lanka: Proximate Composition, Antimicrobial and Antioxidant Activities

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The present study aimed to characterize the proximate composition, antimicrobial and antioxidant activities of five seaweed species namely, *Kappaphucus alvarezii* (Dotty dotty), *Sargassum wightii* (Gulf weed), *Turbinaria ornata* (Crowded sea bell), *Caulerpa peltata* (Saucer algae) and *Caulerpa lentillifera* (Sea grapes), which were collected from different areas in Jaffna district in Sri Lanka. After cleaning and washing, the samples were dried at 55 ℃ and ground to a powder. Proximate composition was measured in dried seaweed powder. The antioxidant activities were determined in water extracts of seaweed powder using three different assays: Total Phenolic Content (TPC), Ferric Reducing Antioxidant Power (FRAP) assay and 2, 2- diphenyl-1-picrylhydrazyl (DPPH) radical scavenging activity. Crude methanol and crude water extracts of seaweeds were examined for antimicrobial properties against four selected pathogens (*Escherichia coli, Pseudomonas aeruginosa, Staphylococcus aureus* and *Candida albicans*). The proximate composition and antioxidant properties varied significantly ($P<0.05$) among seaweed species. The two green seaweeds, i.e., *C. peltata and C. lentillifera* had the highest ($P<0.05$) protein, fat and gross energy contents while the other three seaweeds had significantly ($P<0.05$) high ash contents. The water extracts of brown seaweed, *S. wightii* showed the highest ($P<0.05$) TPC and FRAP, whereas red seaweed, *K. alvarezii* had the highest ($P<0.05$) DPPH radical scavenging activity. Methanol extracts of the five seaweed species showed antimicrobial activity against four pathogens tested, whereas the crude water extracts of two seaweed species tested (*K. alvarezii* and *T. ornata*) showed antimicrobial activity only against *P. aeruginosa*. Present results showed that the five selected Sri Lankan seaweeds contain high nutritional value, antioxidant and antimicrobial properties and, have a potential to be used as a food or food additive that can help to reduce malnutrition and non-communicable oxidative stress-related diseases.

Keywords: Antimicrobial activity, Antioxidant activity, Extracts, Proximate composition, Seaweeds

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