Potential Of Edible Seaweed of The Kenyan Coast as A Micronutrient Source

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Abstract

Edible seaweed, a rich source of micronutrients, remains underutilized in Kenya despite its widespread availability at the Kenyan coast, while micronutrient deficiencies remains a major health concern. The study investigated factors influencing consumption patterns and determined micronutrient and heavy metal content of various seaweed species found in Kenya. A cross-sectional comparative design was employed where 175 seaweed farmers were interviewed in Kwale and laboratory analysis of 58 randomly collected seaweed samples from Mombasa, Kilifi, and Kwale counties was conducted. Micronutrients (vitamin A, D, B9, B12, iron, zinc, iodine) and heavy metals (mercury, lead, arsenic, cadmium) content were determined. Findings revealed a predominant demographic of female seaweed farmers aged 30-40, characterized by low income and education levels. Seaweed farming primarily aimed at commercial purposes rather than personal consumption, largely due to limited awareness of its nutritional value and concerns regarding contamination. A diverse array of edible seaweed species were identified, 11 Phaeophyceae (Sargassum, Turninaria, Dictyota, Padina, Eucheuma), 9 Chlorophyta (Ulva, Caulerpa, Eucheuma) and 8 Rhodophyta (Gracilaria, Hypnea, Soliera, Eucheuma). Significant variations were observed among different regions, phyla and species. Kilifi samples exhibited higher mean levels of vitamin B12, A, D and lead, while Kwale recorded elevated iron levels. Mombasa samples displayed higher cadmium levels. Green phyla exhibited elevated mean levels of vitamin B12, D, zinc, iodine and cadmium while red phyla was rich in vitamin B9, A, and iron. Brown phyla contained higher lead levels. Farmed Eucheuma cotonii recorded the highest levels of vitamin B12 (696.6 mg /100 g) and vitamin A (298.6 mg /100 g) whereas Ulva intestinalis recorded highest levels of iron (637.85 mg/kg). Caulerpa taxifolia had highest level of zinc (277.74 mg/kg). Although traces of lead and cadmium were detected in some species, levels remained within permissible limits. Mercury was detected in only four species, with no arsenic found. The study highlights the importance of increasing awareness and education around the nutritional value of seaweed to promote its consumption in Kenya and aid alleviation of micronutrient deficiencies. It recommends further research in processing, value addition, market integration and strategies to mitigate heavy metal contamination.

Keywords: Edible seaweed, Micronutients, Micronutient deficiencies, Kenyan coast.