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Integration of protein extraction with a stream of byproducts from marine macroalgae: a model forms the basis for marine bioeconomy

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Abstract

The present study describes an advanced biorefinery model for marine macroalgae that assumes significant importance in the context of marine bio-economy. The method investigated in this study integrates the extraction of crude proteins with recovery of minerals rich sap, lipids, ulvan and cellulose from fresh biomass of *Ulva lactuca*. The protein content extracted was $11 \pm 2.12\%$ on dry weight basis with recovery efficiency of $68.75 \pm 4.01\%$. The amino acid composition of crude protein fraction showed isoleucine as the most abundant amino acid with $16.51 \pm 0.03\%$ followed by histidine, arginine, tyrosine, serine, aspartic acid, threonine, phenyl alanine, leucine, alanine, lysine, glycine and glutamic acid ($0.22 \pm 0.24\%$). The digestibility of protein was as high as $85.86 \pm 5.92\%$ indicating its suitability for use in food supplements. The protein production with co-recovery of other products would not only result in effective utilisation marine macroalgal resources but also forms the basis for marine bio-economy.

Keywords: Algal salt, Integrated biorefinery, Nutritional supplement, Sustainable process, *Ulvan*

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