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A comparative study of protein-rich extract using food grade extraction procedure from marine algae, ulva lactuca (chlorophyta): Screening through a two-level factorial experimental design strategy
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Abstract

Seaweed or macroalgae are rich in valuable bioactive compounds like proteins, carotenoids, and phenolics, making them of high commercial interest. This study focuses on investigating the extraction of protein components from the green macroalgae species *Ulva lactuca* using a conventional extraction method with food-grade procedures. We examined the impact of three operational variables: temperature (30-70 °C), duration (1-3 hours), and solute-to-solvent ratio (1-10% w/v) on the extract yield, determined gravimetrically through Kjeldahl analysis. The analysis revealed that the optimal extraction conditions were at 70 °C for 3 hours with a 10:100 (g/mL) solute-to-solvent ratio. The key factors in the extraction process were identified using a Two-Level Factorial design, with the solute-to-solvent ratio showing significant effects and the optimum condition at 10:100 (g/mL). Extraction duration and temperature, however, had a less significant impact on protein yields. The experimental and predicted results were in good agreement, confirming the reliability of the corresponding regression models for prediction. This protein fraction can be further concentrated and purified for use in food formulations. © 2024 Author(s).

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