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Ultrasonic-Assisted Extraction of Astaxanthin from Shrimp By- Products Using Vegetable Oils

Abstract:

Investigating sustainable methods for astaxanthin extraction from shrimp by-products is crucial due to environmental concerns associated with traditional solvent-based techniques. This study explores the feasibility of using eco-friendly vegetable oils, such as olive oil (OO), sunflower oil (SO), and flaxseed oil (FO), in ultrasound-assisted extraction (UAE). Astaxanthin's antioxidant activity was assessed using an ABTS assay, and coacervates formed with a mixture of gum Arabic and soy lecithin were utilized for astaxanthin encapsulation. Optimal conditions were determined: a by-product-vegetable oil ratio of 1:60, 210 minutes extraction time, 60% extraction process amplitude, and OO as the solvent, yielding 235 ± 4.07 μg astaxanthin/g by-products. Encapsulation efficiency was measured at $66.6 \pm 2.7\%$ on day 0, with a recovery rate of $94.4 \pm 4.6\%$ on day 1. Utilizing OO as the extraction solvent presents a promising avenue for reducing the environmental impact of shrimp by-products. The high encapsulation efficiency further underscores its potential application in the food industry.

Biography

Ioannis Panagiotakopoulos is a PhD Candidate at the University of the Aegean, in Lemnos Island, Greece. He applies his expertise in Food Science and Technology. His educational background also encompasses an MBA in Food & Agribusiness from the Agricultural University of Athens. Additionally, he holds a bachelor's degree in food science and nutrition from the University of the Aegean. With a strong focus on innovation and sustainability, he is dedicated to crafting groundbreaking products that meet consumer needs while complying with regulatory standards. Based in Athens, Greece, he continues to drive advancements in product development and research