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Employing response surface methodology for the optimization of ultrasound assisted extraction of lutein and β -carotene from spinach

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Box-Behnken design and response surface methodology (RSM) were used to investigate the effect of process variables on the ultrasound-assisted extraction (UAE) of lutein and β -carotene from spinach. Three independent variables, extraction temperature ($^{\circ}\text{C}$), extraction power (%) and extraction time (min) were studied. Thin-layer chromatography (TLC) followed by UV visualization and densitometry was used as a simple and rapid method for both identification and quantification of lutein and β -carotene during UAE. Methanol extracts of leaves from spinach and authentic standards of lutein and β -carotene were separated by normal-phase TLC with ethyl acetate-acetone (5:4 (v/v)) as the mobile phase. In this study, the combination of TLC, densitometry and Box-Behnken with RSM methods were effective for the quantitative analysis of lutein and β -carotene from spinach extracts. The identity and purity of each TLC spot was measured using time-of-flight mass spectrometry. Therefore, UAE assisted extraction of carotenes from spinach can provide a source of lutein and β -carotene for the dietary supplement industry.

Biography

Ammar Altemimi has worked as a Lecturer (2009-2011) in Department of Food Science and Biotechnology, University of Basrah, Iraq. He has taught Biochemistry and Biotechnology for undergraduates. He was involved in developing academic programs, monitor student's educational progress, motivates other non-teaching staff, manage career counseling and other student service. He has published more than 5 papers in reputed journals such as *Ultrasonic Sonochemistry* Journal and *Molecules* Journal; and he has been serving as an Editorial Board Member of reputed journals.

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