

Effect of Ultrasound on Carotenoids Extraction from Pepper and Process Optimization Using Response Surface Methodology (RSM)

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Abstract : Pepper (*Capsicum annum* L.) which belong to the family Solananceae, are known for their versatility as a vegetable crop and are consumed both as fresh vegetables or dehydrated for spices. Pepper is considered an excellent source of bioactive nutrients. Ascorbic acid, carotenoids and phenolic compounds are its main antioxidant constituents. Ultrasound assisted extraction is an inexpensive, simple and efficient alternative to conventional extraction techniques. The mechanism of action for ultrasound-assisted extraction are attributed to cavitations, mechanical forces and thermal impact, which result in disruption of cells walls, reduce particle size, and enhance mass transfer across cell membranes. In this study, response surface methodology was used to optimize experimental conditions for ultrasonic assisted extraction of carotenoid compounds from Chili peppers. Variables were included extraction temperatures at 3 levels (30, 40 and 50 °C), extraction times at 3 levels (10, 25 and 40 minutes) and power at 3 levels (30, 60 and 90 %). It was observed that ultrasound waves applied at temperature of 49°C, time of 10 minutes and power 89 % resulted to the highest carotenoids contents (lycopene and β -carotene), while the lowest value was recorded in the control. Thus, results showed that ultrasound waves have strong impact on extraction of carotenoids from pepper.

Keywords : carotenoids, optimization, pepper, response surface methodology

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