



Valorisation of *Opuntia ficus indica* oil and residue: Optimization of phenolic compounds extraction, antioxidant activities study

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Abstract:

Cactus (*Opuntia ficus-indica*, OFI), commonly known as prickly pear, belongs to the Cactaceae family. Originated in Mexico, it was introduced into the Mediterranean countries at the beginning of the sixteenth century. These plants grow wild in arid and semi-arid regions, where the production of more succulent food plants is severely limited. The margarine industry has several problems, the oxidation of the lipids is one of the major issues because oxidation is responsible for reducing the nutritional and sensory quality of food. This study was carried out to optimize Microwave-assisted extraction (MAE) and ultrasound-assisted extraction (USAE) process and assess the possibility of use OFI seeds as natural antioxidant additives in food. *Opuntia ficus indica* oil and residue seeds were analyzed for phytochemical contents and antioxidant activities. Moreover, the optimal conditions for microwave-assisted extraction (MAE) and ultrasound-assisted extraction (USAE) of total phenolic content and antioxidant activity radical DPPH from prickly pear seeds residue were investigated using response surface methodology (RSM). The models were verified and validated and the interactions between the factors were studied. High-performance Liquid Chromatography (HPLC) analysis at MAE and USAE optimized conditions revealed the presence of 8 and 9 phenolic compounds respectively, which were then identified and quantified. The effect of MAE and USAE on the cell surface change of OFI seeds residue powder was observed by scanning electron microscopy (SEM). Both OFI oil and residue seeds give high oxidative stability, hence it was an alternative to the synthetic antioxidant in the margarine.

Biography:

Meriem AMRANE is a PhD student at Bejaia University (Algeria). Holds a degree in Food Science (Food Engineer-



ing, Food, and Medicine; Specialty: Food Analysis and Instrumental Analysis). and a master's degree in Biotechnology, Agro-resources Food and Nutrition. His research focuses on photochemical compounds (extraction, biological activities, and bioavailability of these molecules) with the collaboration of Analytical Chemistry Laboratory of Aragon Research Institute (I3A) of Zaragoza University (Spain) and University of Lisbon (Portugal). Furthermore, she works with the collaboration of Department of Environment and Biological Sciences, A. Mira University on in vivo and in vitro pest control. She participated in several national and international congress on the valorization of the prickly pear.

Publication of speakers:

1. Ammar I, Ennouri M, Khemakhem B, Yangui T. Attia H 2012; Variation in chemical composition and biological activities of two species of *Opuntia* flowers at four stages of flowering. *Industrial Crops and Products*, 37(1), 34-40.
2. Inglese P, Barbera G. La Mantia T 1995; Research strategies for the improvement of cactuspear (*Opuntia ficus-indica*) fruit quality and production. *Journal of Arid Environments*, 29(4), 455-468.
3. Sawaya W, Khalil J. Al-Mohammad M 1983; Nutritive value of prickly pear seeds, *Opuntia ficus-indica*. *Plant Foods for Human Nutrition*, 33(1), 91-97.

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