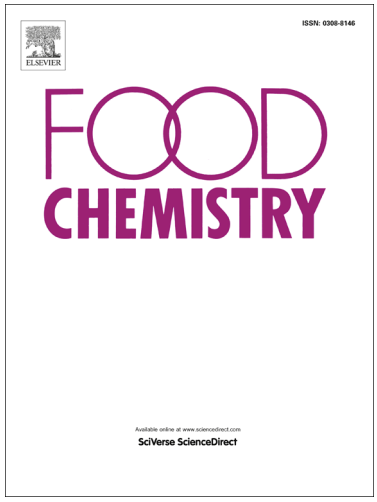

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PII: S0308-8146(18)31116-6
DOI: https://doi.org/10.1016/j.foodchem.2018.06.140
Reference: FOCH 23101

To appear in: *Food Chemistry*

Received Date: 26 March 2018
Revised Date: 19 June 2018
Accepted Date: 28 June 2018

Please cite this article as: Granata, G., Stracquadanio, S., Leonardi, M., Napoli, E., Consoli, G.M.L., Cafiso, V., Stefani, S., Geraci, C., Essential Oils Encapsulated in Polymer-based Nanocapsules as Potential Candidates for Application in Food Preservation, *Food Chemistry* (2018), doi: https://doi.org/10.1016/j.foodchem.2018.06.140

Essential Oils Encapsulated in Polymer-based Nanocapsules as Potential Candidates for Application in Food Preservation

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Abstract

The aim of this work is the encapsulation of essential oils (EOs) in polymeric nanocapsules (NCs), in order to enhance their antimicrobial activity against food-borne pathogens. *Thymus capitatus* and *Origanum vulgare* EOs were selected for their different chemical composition, carvacrol (73%) and thymol (44%) being the major constituent, respectively. Polymeric poly(ε-caprolactone) (PCL) nanocapsules loaded with EOs were prepared by a nanoprecipitation method. The EO-NCs showed monomodal distribution with diameter size 171 and 175 nm, high efficiency of encapsulation and stability with high retention of EOs at both 4 °C and 40 °C, for a period of at least 30 days. The antimicrobial activity of EO-NCs against food-borne pathogens was higher than that of the corresponding pure essential oils and the NCs loaded with *Thymus capitatus* EO were the most active. Interestingly EO-NCs showed a bactericidal activity even at the minimum inhibitory concentrations (MICs). It makes them appealing as natural food preservatives.

Keywords, polycaprolactone nanocapsule; essential oils; antimicrobial activity; food-borne pathogens; natural food preservative.

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