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Antimicrobial activity of cinnamon essential oil encapsulated in simple emulsion against bacteria

Encapsulation by means of emulsification has been recently studied to protect lipidic compounds in a micro- and nano-scale. Cinnamon essential oil has demonstrated important antimicrobial activity against microorganisms, due to its components (Cardoso-Ugarte, López-Malo, Sosa-Morales, 2016). The aim of this study was to evaluate the antimicrobial activity of cinnamon essential oil encapsulated in simple emulsion, against *Escherichia coli* or *Listeria monocytogenes* in model systems. The essential oil was encapsulated in O/W simple emulsion, prepared by ultrasonic homogenization. The emulsion was characterized as Figure 1. The antimicrobial activity was determined by the minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) for both bacteria. The characterization of the emulsion was reported with the following data: particle size with a median diameter (D50) of 1.15 μm , a viscosity of 1.092 ± 0.011 mPa·s, a density of 1.023 ± 0.00 g/cm³, a pH value of 4.77 ± 0.01 and the color parameters of L* (85.44 ± 0.35), a* (-1.84 ± 0.01) and b* (2.98 ± 0.01). The result for MIC and MBC of pure essential oil was 12.5 ppm, for *L. monocytogenes* and for *E. coli* was 10 ppm. The cinnamon essential oil encapsulated presented different MIC and MBC for the studied bacteria, for *E. coli* was 10 ppm and 2.5 ppm, while for *L. monocytogenes* was 8 ppm and 2.5 ppm, respectively. In conclusion, the MIC was higher than the registered MIC value, for both bacteria in pure essential oil or encapsulated. Moreover, the cinnamon essential oil encapsulated demonstrated to be more effective against these bacteria, in comparison with the pure essential oil. This study showed that the essential oil encapsulated in simple emulsion can be used for different applications against microorganisms.

Biography

Maria Teresa Jiménez-Munguía has participated in research projects in the area of food processing applying emerging technologies, such as ultraviolet treatments, ultrasound and combined methods, as well as in powder technology with agglomeration and encapsulation processes, particularly for functional products development and nutraceuticals. She is actually member of the National System of Researches (SNI) of Mexico, with the distinction level I, since 2015. She is an active member of national (AMIDIQ, AMECA) and international associations (IFT and IFA).

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