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**INKAPSULACIJA SUPERKRITIČNOG EKSTRAKTA  
KORE MANDARINE PRIMJENOM METODE  
ELECTROSPRAYING**

**INCAPSULATION OF MANDARIN PEEL  
SUPERCRITICAL EXTRACT BY ELECTROSPRAYING**

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Mandarin peel is a by-product produced in high quantities by food industry worldwide. It contains high amount of valuable compounds, such as essential oil and aromatic compounds. These constituents can be successfully and without degradation extracted by application of supercritical carbon dioxide (CO<sub>2</sub>). For transformation in powder form, extract obtained through this extraction technology, could be transformed by different drying technologies, among electrospraying is one of best possible solutions. Electrospraying does not require the use of high temperatures and, thus, temperature-sensitive ingredients may be encapsulated without suffering from any loss.

Supercritical extract of mandarin peel was successfully dissolved in soy bean oil. This was the starting solution for emulsification process. For emulsification whey protein and surfactant Tween were used, in different concentrations. To provide stabile emulsions homogenization followed by ultrasound treatment was used. Homogenization was applied in duration of 2 minutes, while ultrasound treatment was applied in two cycles, where one cycle consists of 30 sec treatment with cooling phase (on ice) in duration of 30 sec, to avoid degradation of thermo sensitive compounds. Emulsion obtained by 35% whey protein was successfully transformed into the powder form by electrospraying at voltage of 18kV and flow rate of 0.25 mL/h. Structure of this way obtained powder was analysed using SEM and optical microscopy.

**Keywords:** electrospraying, powder, supercritical extraction, mandarin peel

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