**Encapsulation of polyphenolic bioactive compounds into stable structures using spray drying and electrospinning process for food applications**

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Plants are excellent sources of [bioactive compounds](https://www.sciencedirect.com/topics/food-science/bioactive-compound) with beneficial properties in human’s health. In recent years, plant extracts are incorporated into food products in order to enhance food’s functionality. However, these components are unstable during processing and storage so encapsulation of them into suitable matrices is used as a promising technique to enhance their stability. The primary aim of this study was the encapsulation of plant-derived compounds into stable structures, the characterization of the developed structures and the evaluation of their release rate and stability during storage conditions. The bioactive compounds with high antioxidant activity were recovered through optimum conditions from oregano, rosemary and *Magnolia officianalis* plants using microwave/ ultrasound assisted extraction. The recovered extracts were evaluated in terms of antioxidant activity and total phenolic content (TPC). Encapsulation was performed by electrospinning process and spray drying using natural polymers as wall materials. The influence and optimization of operating parameters on the encapsulation efficiency (EE) of the above methods were investigated with response surface methodology (RSM) and central composite design (CCD). EE was determined using Folin-Ciocalteu method and ATR-FTIR technique was used to confirm the presence of antioxidant components in the various structures examined. The morphology of the resulting structures was characterized by SEM and the release kinetics of the encapsulated ingredients were studied over time under different storage conditions. The results of this study showed that the investigated methods can effectively encapsulate phenolic extracts from oregano, rosemary, and *Magnolia officianalis*. The developed encapsulated structures were characterized by increased storage stability resulting in the appropriate use of them as food additives.

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