Evaluation of different encapsulation strategies of olive leaf phenolic extract on the storage stability of salad dressings

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Olive leaves are the most abundant waste of the olive oil industry; therefore, a strategy for their valorization can improve the sustainability of the production chain. In particular, olive leaves can be used for the recovery of phenolic compounds to be used in food, pharmaceutical, and cosmetic industries due to their antioxidant and antimicrobial activities. However, polyphenols are very sensitive to several environmental factors leading to poor stability and bioavailability and drastically reducing their effectiveness. Thus, new strategies for protecting phenolic compounds towards degradation need to be developed. The aim of this work was the evaluation of storage stability of salad dressings containing olive leaf extract (OLE) as such (free OLE) or encapsulated in alginate microcapsules and/or in double W/O/W emulsions. Creaming, rheological properties, double emulsion yield, pH, total phenol content (TPC), antioxidant activity, and peroxide value (PV) of the dressings were monitored over 90 days at 4 °C. A more homogeneous distribution of the oil droplet size was observed in salad dressings produced with OLE. All samples were physically stable during storage, showing no creaming and very little variations in rheological parameters (< 10%). OLE enrichment significantly ($P < 0.05$) improved the rheological behavior, with a more significant effect of alginate-encapsulated OLE due to the presence of the hydrocolloid. The oxidation induction period of dressings was extended from 15–20 days to 50 days by the presence of OLE and a gradual polyphenol release during storage was demonstrated as a result of encapsulation. In conclusion, the work demonstrated the effectiveness of OLE encapsulation in improving salad dressing properties, especially when the emulsification-internal gelation technique was applied.

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