Origanum vulgaris essential oil-loaded nanosystems: preparation, characterization and stability studies

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Introduction
In recent years, there has been a growing interest in the therapeutic properties of natural herbal essential oils. Origanum vulgaris essential oil (OEO) has shown a wide range of medicinal applications. However, therapeutic applications of EO in general are limited since it's proven that they possess high volatility and poor stability, water solubility and bioavailability, leading to decline/loss of efficiency. In that regard, nano-encapsulation of OEO is a promising approach to overcome these disadvantages.
Purpose
Preparation and evaluation of the encapsulation efficiency and stability of OEO nanosystems.
Methods
Preparation and characterization of different nanocarriers, liposomes and nanoemulsions, was done by using the ethanol injection method (Lipoid S100, Phospholipon 85G, and 90H) and homogenization process (MCT, lecithin, and surfactant), respectively. Their particle size, polydispersity index, Zeta potential, encapsulation efficiency were compared and evaluated at t0 and after 2 months.
Results
Stability results for 2 months at 25°C showed that nanoemulsions produced similar results to Phospholipon 90H based liposomes, exhibiting the average particle size of the smallest of all studied formulations. Compared to Ph 85G/Lipoid S100 loaded liposomes, Ph 90H loaded liposomes and nanoemulsions improved the loading rate of OEO.
Conclusion
According to our findings, developing OEO nano delivery systems has the potential to solve the major shortcomings of its free unencapsulated form while also enhancing encapsulation efficiency, making it a prospective choice for a more efficient therapeutic strategy.

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