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Characterization of *Zataria multiflora* essential oil loaded solid lipid nanoparticles

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Background and Aims: Zataria multiflora has several traditional uses such as antiseptic, antispasmodic and also antibacterial and antifungal activity have been reported. It is well known that most essential oils are rapidly volatile and unstable. In order to overcome these problems, solid lipid nanoparticles (SLNs) were used as carriers of essential oil. The aim of the present study was to formulate and characterize SLNs loaded with essential oil.
Methods: The essential oil was extracted from Z. multiflora and analyzed by GC-Ms. SLNs were prepared using the hot homogenization method and composed of cetylalcohol, sodium dodecyle sulfate and polyethylenglycol. The quantity of essential oil was measured for thymol, which is the main constituent of the oil. SLNs were characterized by Differential Scanning Calorimetery (DSC) and particle size analyzer.
Results: The main constituent of the essential oil detected by GC-Ms was thymol. The encapsulation of the SLNs was 28.33±2.93. The results of particle size determination showed a size of 625 nm and DSC curve showed that the essential oil can interact with the matrix lipid during the preparation of the SLNs.
Conclusions: This study showed that it is possible to formulate SLN with good properties and several applications including drug encapsulation.

Keywords: *Zataria multiflora*; Essential oil; Solid lipid nanoparticles