

Preparation of Essential Oil Capsule (Carum Copticum) In Chitosan Nanoparticles and Investigation of Its Biological Properties

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Abstract : Essential oils' unique and practical properties have been widely reported in recent years. Still, the sensitivity of critical oils to environmental factors and their poor solubility in aqueous solutions have limited their use in industries. Therefore, we encapsulated C. copticum essential oil in chitosan nanoparticles by emulsion-ionic gelation with sodium tripolyphosphate and sodium hexametaphosphate cross-linkers. The nanoparticles showed a round shape with an average size of 30-80 nm and a regular distribution. The release profile in the laboratory environment showed a burst in the initial release and then a stable release of C. copticum essential oil from chitosan nanoparticles at different pH. Antioxidant and antibacterial properties of C. copticum essential oil before and after the encapsulation process were evaluated by 2,2-diphenyl-1-picrylhydrazyl radical and disc diffusion methods, respectively. The results showed that the encapsulation of C. copticum essential oil in chitosan nanoparticles could protect its quality and bioactive compounds and improve the properties of the crucial oil.

Keywords : essential oils, Carum copticum, biological activities, nanotechnology

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