



Encapsulation of eucalyptus essential oil using β -cyclodextrin and evaluation of its water solubility

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Statement of Problem: Eucalyptus is a flowering tree from the Myrtle family. It is native to Australia that has widespread applications in timber and pulpwood industries. Eucalyptus essential oil (EEO) is used as an abundant remedy in traditional medicine because of its multiple biological activities like anti-bacterial, anti-oxidant, disinfectant, chemotherapy, respiratory, and gastric. Water insolubility is one of the disadvantages of essential oils for medical usage. Cyclodextrins (CDs) play an important role in the drug encapsulation field as host molecules. They have hydrophobic cavities and hydrophilic exteriors. This ability of CDs increases the water solubility of various molecules.

Research Purpose: In the present study, we prepared an encapsulation of EEO as a guest and β -CD as a host molecule using the co-precipitation method to increase the solubility of EEO.

Research Method: For this purpose, 0.5 mL of EEO was added to 10 mL of hydroalcoholic solution β -CD. The mixture was put in an ultrasonic bath for 30 min. The residue was centrifuged and dried in a freeze drier. The water solubility of the product (EEO/ β -CD) was evaluated with different concentrations and checked by UV-Vis. spectrophotometer.

Results and Conclusion: According to the UV-Vis. spectra, the presence of peaks at 289 and 294 nm confirmed the formation of the product. Furthermore, A concentration increase in water solubility of EEO/ β -CD was observed by UV- Vis. spectroscopy analysis.

In conclusion, the solubility of eucalyptus essential oil was increased by the preparation of an inclusion complex using β -cyclodextrin.

Keywords: β -cyclodextrin; Eucalyptus; solubility