



ABSTRACT

Essential oils, plant borne volatile secondary metabolites, are fascinating natural compounds, showing therapeutic potential in various fields such as pharmaceutical, food, cosmetics and aromatherapy. In the current study, *Trachyspermum ammi* (ajwain), a clinically important and therapeutic herb is used for the purpose of extraction of these volatiles and the effect of different extraction techniques on the yield was investigated. The techniques applied and their relative yield were: Microwave Assisted Hydodistillation; 0.94%, Ultrasound Assisted Hydro-distillation; 1.32%, Enzyme Assisted Extraction included (a) Cellulase-assisted hydro-distillation; 2.09%, (b) Viscozyme-assisted hydro-distillation; 1.93%, NaCl-macerated hydro-distillation; 0.77%, Tritone X 100-macerated extraction; 2.31%, Glucose-macerated hydro-distillation; 1.54%, and Polyethylene glycol (Coolant)-assisted hydro-distillation; 1.65%. Furthermore, Response Surface Methodology (RSM) with Face Centered Central Composite Design (FCCCD) was used to investigate the effect of selective parameters on the yield of essential oil by using enzyme-assisted hydro-distillation. The predicted and actual yield observed were 48.4 and 47.8 ml respectively which were in good agreement. To check the antioxidant activity of EO from *Trachyspermum ammi*, DPPH, TPC and Trolox Equivalent Free Radical Scavenging performed.