## Optimizing nanoencapsulation of Heracleum Lasiopetalum by response surface methodology

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## Abstract

This study was carried out to optimize formulation for Heracleum Lasiopetalum (golpar) extract nanoencapsulation by response surface methodology (RSM). The primary emulsion was fabricated by (5-10 %) golpar extract (GE), (40-35 %) emulsifier span 80 (EM), and (50-60 %) sunflower oil (SO). The coating materials of nanoencapsulation were the composition of Lepidium sativum seed gum (LSG) and whey protein concentrate (WPC) at different ratios (1:0, 1:1, and 0:1). The yield of nanoencapsulation of golpar extract, particle size, and zeta potential was investigated as responses of RSM. The optimal formulation for nanoencapsulation of golpar extract were SO: 50.46%, GE 9.52%, and EM: 36.30% in LSG, SO: 57.07%, GE: 7.12%, and EM: 30.85% in LSG:WPC, and SO: 54.98%, GE: 9.05%, and EM: 39.87% in WPC coating. In conclusion, the nanoencapsulation of golpar extract prepared with the optimized formulation by RSM ensures the gradual release and sedimentation during storage with nanometric size and high yield of encapsulation. The nanocapsules of golpar extract can be used as a natural antioxidant in food systems.

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