

Research article

Development and optimization of Liquorice crude protein nanoparticles from *Glycyrrhiza glabra L.*

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Abstract

This study is focused on extraction, development and optimization of Liquorice crude protein nanoparticles from the root powder of *Glycyrrhiza glabra L.* Liquorice decoction has been used for various ailments from the olden times itself besides its flavouring action. Extraction of protein was done in phosphate buffer at -4°C by salting out method. The precipitated protein (Liquorice crude protein) was purified by dialysis bag method with MWCO (12-14kDa) to remove the excess salt. The main approach in designing nanoparticles is to control particle size, surface properties and drug release. Liquorice crude protein was formulated into nanoparticles by simple coacervation/desolvation method using ethanol, water and tween-80 (2%v/v) by thermal cross linking. Optimization was done by using 2 factors and one response in Design Expert -12® software. Based on desirability function the optimized formula was selected and was characterized for various physical and chemical properties of nanoparticles. The particle size of nanoparticle was found to be 326.9 nm with PDI 0.271 and zeta potential of -10.9 mV. The potential of LCP nanoparticle formulation with desirability function in optimizing nanoparticle formulation has made it possible to identify the impact of various independent variables on optimization of the formulation for better responses. The finished products of liquorice protein nanoparticles are high in safety as it exists in various decoctions. These Liquorice Crude Protein nanoparticles can be applied to *in-vivo* delivery of various drugs.