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Development and biochemical activity of *Gymnema sylvestre* leaf extract-loaded nonionic surfactant-based niosomes

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The aim is to develop and characterize *Gymnema sylvestre* leaf extract-loaded niosomes using nonionic surfactants and to evaluate their antidiabetic activity against the leaf extract. Nonionic surfactant-based *G. sylvestre* leaf extract-loaded niosomes were developed using the thin-film hydration technique. The niosomal formulation was optimized by using RSM (Box Bhengan design). The optimized formulation was screened for their morphology, particle size, zeta potential and entrapment efficiency, Differential Scanning Calorimetry (DSC) analysis TEM and FTIR for their functional group. Niosomes prepared using Span™ 40 and Span 60 provided sterically stable vesicles 138.8 nm in size with zeta-potential and entrapment efficiency of 150.86 mV and 85.3±4.5%, respectively. The surface morphology of vesicles was confirmed to be spherical by scanning electron microscopy studies. This study reveals the advantages of *G. sylvestre* leaf extract-loaded niosomes and justifies the potential of niosomes for improving the efficacy of *G. sylvestre* extract as anti-diabetic.

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