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Utility of modified locust bean gum for dissolution improvement of poorly soluble drug

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The present research was aimed at the enhancement of the dissolution rate of glimepiride by the solid dispersion technique using modified locust bean gum. The locust bean gum was subjected to heat for modification. Modified solvent evaporation technique was used to prepare solid dispersions (in various drug: polymer ratios). Other mixtures were also prepared by physical mixing, co-grinding, and the kneading method. Various solid dispersions and other mixtures were evaluated for equilibrium solubility studies, content uniformity, FTIR, DSC, XRD, *in vitro* drug release, and *in vivo* pharmacodynamic studies. Maximum equilibrium solubility was observed in the solid dispersions SD3 (in a drug: polymer ratio of 1:6) and co-grinding mixture also showed equivalent solubility. Maximum dissolution rate was observed in the solid dispersion batch SD3 (i.e. 48% within 15 min) with maximum drug release after 2 h (89%). The co-grinding mixture also exhibited a significant enhancement in the dissolution characteristics (45% in 15 min and 85% after 2h) among the other mixtures. FTIR studies indicated the absence of drug-polymer interaction in the solid dispersions, which was further supported by XRD studies. Minor shifts in the endothermic peaks of the DSC thermograms of SD3 and CGM indicated slight changes in drug crystallinity. Topological changes were seen in SEM images of SD3 and CGM. *In vivo* pharmacodynamic studies indicated an improved efficacy of the optimized batch SD3 as compared to the pure drug ($p \leq 0.05$). Reduction in particle size, decreased crystallinity of drug with less viscosity and wetting ability of modified locust bean lead to enhanced dissolution characteristics. The co-grinding mixture can be a good alternative to solid dispersions.

Biography

Kanav Midha, a post graduate fellow, Chitkara University, India. He is currently working on research project entitled Utility of modified locust bean gum for dissolution improvement of poorly soluble drug. Before joining as post graduate fellow, he had completed Bachelor's in Pharmacy from Swami Vivekanand Group of Institutes and worked with Medtronic India for 7 months. He is a life time member of Indian Pharmacy Graduates Association and has attended various National and International conferences in India.

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