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## Formation of solid dispersions famotidine with HPMC E5LV and mannitol with co-grinding technique

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**Background & Aim:** Solid dispersion has attracted considerable interest as an efficient means of improving the solubility and the dissolution rate of poorly water-soluble drug. The aim of this study was to prepare solid dispersions of famotidine with HPMC E5LV and mannitol as carrier to improve its solubility and its dissolution rate.

**Methods:** Co-grinding techniques by using ball milling was used. 18 formulae with 3 different ratios to HPMC and mannitol (1:1, 1:2, 2:1) and 3 different grinding times (30', 60', 90') were prepared. Characterization of solid dispersion was analyzed with scanning electron microcopy analysis (SEM), X-ray diffraction, Fourier transform infrared (FTIR), optilab microscope camera, solubility test and dissolution test. The solid state interaction of co-ground and physical mixture was evaluated by X-ray powder diffraction and SEM. The dissolution studies were conducted in USP type II apparatus.

**Results:** The result of X-ray powder diffraction analysis showed that the co-ground of famotidine with HPMC E5LV and mannitol decreased the drug crystallinity. X-ray powder diffraction showed the transformation of crystalline state of famotidine to amorphous by co-grinding with HPMC E5LV and mannitol.

**Conclusion:** SEM results showed the co-ground mixture with HPMC E5LV had smaller size and co-ground mixture with mannitol showed agglomerate form. The highest in solubility and dissolution rate was observed for famotidine-HPMC and E5LV showed in 1:1 ratio with 90' grinding time and famotidine-mannitol showed in 1:2 ratio with 30' grinding time compared to the intact famotidine and its physical mixture.

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## Potential healing effects of *Hibiscus sabdariffa* L. flowers on arthritis

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The present study has been focused to assess the anti-inflammatory activity and healing effects of the aqueous extract of *Hibiscus sabdariffa* L. flowers on induced arthritis in mice and compare it with meloxicam (Mobic®), one of the most conventional drugs used to treat arthritis. The water extract of *Hibiscus sabdariffa* was administered orally at a dose of 300 mg/kg, 400 mg/kg and 500 mg/kg body weight for 14 days after induction of arthritis with incomplete fruend's adjuvant. (T1, T2 and T3) showed a significant increase in body weight when compared with T4, negative and positive control groups. A significant decrease in the levels of RBC and Hb was observed in all groups subjected to arthritic (T1, T2, T3, T4 and T5) when compared to the negative group (T6). The administration of the aqueous extract of *Hibiscus sabdariffa* L. flowers to arthritic mice in (T1, T2 and T3) improved the levels of Hb and RBC to near normal. A significant reduction (P≤0.01) in spleen weight, WBC, ESR, CPR and serum copper level was found at all treatment groups with the water extract of Hibiscus sabdariffa in comparison with the groups treated with meloxicam, the positive and the negative (T1, T2 and T3) revealed a significant (P≤0.01) reduction of the inflammation in comparison with the other treatment groups (T4, T5). A better activity was observed at 500 mg/kg body weight in mice.

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