World Academy of Science, Engineering and Technology
International Journal of Agricultural and Biosystems Engineering
Vol:12, No:10, 2018

Solubility and Dissolution Enhancement of Poorly Soluble Drugs Using Biosericin

Authors : Namdeo Jadhav, Nitin Salunkhe

Abstract : Currently, sericin is being treated as waste of sericulture industry, especially at reeling process. Looking at prospective physicochemical properties, an attempt has been made to explore pharmaceutical applications of sericin waste in fabrication of medicated solid dispersions. Solid dispersions (SDs) of poorly soluble drugs (Lornoxicam, Meloxicam & Felodipine) were prepared by spray drying, solvent evaporation, ball milling and physical kneading in mass ratio of drug: sericin (1:0.5, 1:1, 1:1.5, 1:2, 1:2.5 and 1:3 w/w) and were investigated by solubility, ATR-FTIR, XRD and DSC, micromeritics and tablettability, surface morphology and in-vitro dissolution. It has been observed that sericin improves solubility of drugs by 8 to 10 times compared to pure drugs. The presence of hydrogen bonding between drugs and sericin was confirmed from the ATR-FTIR spectra. Amongst these methods, spray dried (1:2 w/w) SDs showed fully amorphous state representing molecularly distributed drug as confirmed from XRD and DSC study. Spray dried meloxicam SDs showed better compressibility and compactibility. The microphotograph of spray dried batches of lornoxicam (SDLX) and meloxicam SDs (SDMX) showed bowl shaped, and bowl plus spherical particles respectively, while spray dried felodipine SDs (SDFL) showed spherical shape. The SDLX, SDMX and SDFL (1:2 w/w) displayed better dissolution performance than other methods. Conclusively, hydrophilic matrix of sericin can be used to deliver poor water soluble drugs and its aerodynamic shape may show a great potential for various drug deliveries. If established as pharmaceutical excipient, sericin holds a potential to revolutionise economics of pharmaceutical industry, and sericulture farming, especially of Asian countries.

Keywords : biosericin, poorly soluble drugs, solid dispersion, solubility and dissolution improvement
Conference Title : ICIBS 2018 : International Conference on Insect Biotechnology and Sericulture
Conference Location : Sydney, Australia
Conference Dates : October 04-05, 2018