



Development and evaluation of tablets of complexed aspirin with fulvic acid of shilajit exudate and hydroxy-propyl- β -cyclodextrin

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Shilajit, also known as salajit, shilajatu, mumie or mummiyo is a pale-brown to blackish –brown exudation, of variable consistency, coming out from layer of rocks in many mountain ranges of the world, especially the Himalayan ranges of the Indian subcontinent. It is a wonder medicine of ayurveda, neither a plant nor animal origin, it is a mineral pitch that comes out from the rocks, as they become warm during summer months. The major physiological action of shilajit has been attributed to the presence of the bioactive dibenzo-alpha-pyrones along with humic and fulvic acids which act as carrier molecules for the active ingredients. Fulvic acid (FA) acts as complexing agent similar to Hydroxy-propyl- β -cyclodextrin (HP- β -CD) having exterior hydrophilic and interior hydrophobic. It entraps the bioactive constituents of shilajit and is responsible for their stability in natural habitat. Fulvic acid have polymeric structure having large number of voids and pores with a number of functional groups which are capable of forming inclusion complexes. The interior of this complexing agents are thus capable of forming inclusion complexes with non-polar solutes and drug molecules with low bioavailability. The aspirin (ASA) molecule has a carboxyl group and an ester group. The ester group can be easily hydrolyzed, which reduces the medical value and causes side effects on humans. A strategy designed how to inhibit the hydrolytic decomposition and enhancement of dissolution of aspirin inside the void of fulvic acid of shilajit.

Complexes of ASA with FA and HP- β -CD were prepared using different techniques such as solvent evaporation, freeze drying, and spray drying in the molar ratios 1:0.5, 1:1, and 1:2 (ASA:FA/HP- β -CD). Based upon the release profile of aspirin from solid complexes various formulations were prepared and tested for dissolution rate and profile. For example, fulvic acid spray dried (1:1) complexes were optimized on the basis of dissolution and stability data therefore conventional release tablets were prepared using this optimized complex. On the other hand, a tablet of hydroxy propyl β -cyclodextrin complex was prepared and compared with tablet of fulvic acid complex. Tablets were prepared by direct compression method using following ingredients. Ingredients were mixed thoroughly in a dry mortar and compressed on Trover multipunch tablet machine. The tablets of optimized complexes of fulvic acid and HP- β -CD were kept to stability studies to evaluate any physical or chemical changes on storage. Optimized tablets were packed in a sealed polythene lined aluminum pouches and stored in stability chambers at 40°C and 75% RH for 3 months. The tablet samples were withdrawn periodically at predetermined time interval (0, 1, 2 and 3 months) and were evaluated for physical changes, drug content, hardness and disintegration time.

There were no significant degradation of aspirin in their optimized complex of fulvic acid and HP- β -CD after 3 month storage at 40°C with 75% RH. The percentage drug content after three months at accelerated storage condition of 40°C and 75% RH was found to be 99.4% and 99.5% for tablets of fulvic acid and HP- β -CD complexes respectively. Other formulation characteristics like hardness, appearance and disintegration time showed changed slightly throughout the stability testing period. From the study it was concluded that the tablets are physically and chemically stable to temperature and humidity subjected.