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Biopolymer based formulation for improving the bioavailability of drugs

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In recent years, considerable attention has been focused on hydrophilic polymers in the design of oral controlled drug delivery systems because of their flexibility to obtain a desirable drug release profile, cost effectiveness. Hydrogels are polymeric networks with three-dimensional configuration capable of imbibing high amounts of water or biologicals fluids from about twenty to thousand times their dry weight. Their affinity to absorb water is attributed to the presence of hydrophilic groups such as OH, CONH, $CONH_2$, and SO_3H in polymers forming hydrogel structure. The crosslinks present in the hydrogel structure which show swelling characteristics instead of being dissolved in the aqueous surrounding environment. Among the hydrophilic polymers,cellulose derivatives such as methyl cellulose, hydroxyl propyl methyl cellulose and sodium carboxy methyl cellulose are generally considered to be stable and safe as release retardant excipients in the development of oral controlled release dosage forms. These semisynthetic polymers are quite expensive when compared with natural polymers such as guargum, xanthan gum and so forth. The use of natural polymers for pharmaceutical applications is attractive because they are economical, readily available, non-toxic, and capable of chemical modifications, potentially biodegradable and biocompatible.

The attempt is to increase the aqueous solubility of curcuminoids by imparting hydrophilic character of a water-soluble carriers such as grandis gum was caried out. Solid Dispersion Technique was used to increase the dissolution and absorption of poorly soluble drugs by dispersing the drug in a highly water soluble carrier in a solid state. This technique was utilized to improve the solubility of some natural products such as silymarin, quercetin and rutin. Five formulations were prepared with 1:1, 1:2, 1:3, 1:4, 1:5 drug: polymer ratio. They were comparatively evaluated for their better release profile. These sustained release solid dispersion systems resulted in enhancing bioavailability and sustained action. The biovailability of curcuminoids solid dispersions increased upto 10 times by imparting hydrophilic character of grandis gum.

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