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Glyoxylated pre-gelatinized starch used as novel excipient in pellet for the extended drug delivery: A statistical approach

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The current study was aim to developed extended release (ER) pellets formulations containing zaltoprofen as a model drug and glyoxal treated starch hydrogel composite as a binder and extended release polymer. The glyoxal treated starch hydrogel composites were prepared using a 3^2 full factorial design approach and characterized by FTIR, DSC, XRD and SEM analysis. The matrix pellets were prepared by extrusion-spheronization technique and characterized production yield, FTIR, DSC, XRPD, SEM, optical microscopy, flow characteristics, mucoadhesiveness, *in-vitro* dissolution and *in-vivo* pharmacokinetic parameter. The FTIR interpretation of glyoxal treated starch hydrogel composite provides the significant result as a formation of hemiacetal group and keton group of glyoxal is abolished; hence it could be satisfied that star-κ-carr cross-linked hydrogel composite was formed. The optimized formulation (G5) was contained 4:8 ratio of glyoxal treated starch hydrogel composite showed *in-vitro* drug release up to 99.15 ± 2.20 %, 16h, respectively and *in-vivo* parameter were showed decrease in C max and increase in t1/2 significantly and drug release more than 12h. Hence it was concluded that optimized formulation (G5) showed acceptable release pattern, hence would be the viable alternative to ER type formulations.

Recent Publications

1. Sonawane R O, Patil S D (2018) Fabrication and statistical optimization of starch-κ-carrageenan cross-linked hydrogel composite for extended release pellets of zaltoprofen International Journal of Biological Macromolecules 120 (2018) :2324–2334.
2. Sonawane R O, Patil S D (2017) Gelatin–κ-carrageenan polyelectrolyte complex hydrogel compositions for the design and development of extended-release pellets. International Journal of Polymeric Materials and Polymeric Biomaterials 66(16):812–823.
3. Jade P B, Sonawane R O, Patil S D, Ige P P, Pardeshi C V (2017) Co-processed κ-Carrageenan-Pectin as Pelletizing Aid for Immediate Release Pellets. Particulate Science and Technology 35(2):192–200.

4. Sonawane R O, Patil S D (2016) Formulation aspects and effect of critical factors for designing extended release pellets: An updated review. Polymer-Plastics Technology and Engineering 55(9): 976-989.
5. Sonawane R O, Patil V P, Patil S D. (2017) Co-solvency and anti-solvent method for the solubility enhancement of drug: an overview. International journal of pharmaceutical and analytical research, 2(1):13-33.

Biography

Savita D. Patil has her expertise in pharmacological evaluation of pharmaceutical dosage form and passion in improving the asthmatic patients health. Her experience on pharmacological screening of herbal formulation and potent active compounds collaboration with other departments make it responsive constructive researcher for improving healthcare of patients.

Notes: