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ABSTRACT

The present study investigates the extraction, characterization, and operation of polysaccharides deduced from jute (*Corchorus olitorius*) leaves as a natural list agent in the expression of matrix tablets containing diclofenac sodium, a extensively used nonsteroidalanti-inflammatory medicine (NSAID). Jute leaves were reused through hot waterless extraction followed by ethanol precipitation to gain crude polysaccharides, which were also purified and dried. The uprooted polysaccharide was subordinated to colorful physicochemical characterizations, including humidity content, pH, solubility, swelling indicator, and flow properties. Structural and thermal analyses were carried out using Fourier transfigure Infrared Spectroscopy (FTIR), Differential Scanning Calorimetry (DSC), and Thermogravimetric Analysis (TGA), attesting the presence of characteristic polysaccharide functional groups and thermal stability suitable for pharmaceutical use. The binding effectiveness of the jute splint polysaccharide was estimated by formulating matrix tablets of diclofenac sodium using the wet granulation system, where it was incorporated at varying attention (2, 4, and 6 w/ w) and compared with a standard synthetic binder, hydroxypropyl methylcellulose (HPMC). The tablets were estimated for physical parameters similar as hardness, frangibility, weight variation, medicine content uniformity, and in vitro medicine release. The results demonstrated that tablets containing jute polysaccharide displayed respectable mechanical strength and sustained medicine release over a 12- hour period. medicine release followed prolixity- controlled kinetics, with models indicating anon-Fickian release medium. The study concludes that jute splint polysaccharide possesses promising list properties and can be effectively used as a natural volition to synthetic binders in matrix tablet formulations. This work not only offers a value- added use of agrarian waste but also promotes the development ofeco-friendly and cost-effective

excipients in pharmaceutical formulations, aligning with the growing interest in green and sustainable pharmaceutical practices.

Keywords: JLP polysaccharide, FTIR, DSC, TGA, NMR spectroscopy, drug release