

ABSTRACT

In the development of oral pharmaceutical suspensions, achieving physical stability remains a persistent challenge due to sedimentation, poor redispersibility, and formulation inconsistency. Conventional synthetic flocculating agents, although effective, often raise concerns regarding their biocompatibility and environmental sustainability. This study investigates the potential of jute leaf polysaccharide (JLP), derived from *Corchorus olitorius*, as a natural, biodegradable flocculating agent in the formulation of paracetamol suspensions. JLP was extracted via aqueous maceration and alcohol precipitation, followed by characterization for viscosity, solubility, and pH. Oral suspensions of paracetamol were formulated with increasing concentrations of JLP (0.5%, 1%, and 2%) and compared with formulations containing the standard flocculant tragacanth. The prepared suspensions were evaluated for sedimentation volume, redispersibility, viscosity, turbidity, pH stability, and compatibility using FTIR spectroscopy. Results indicated that 1% JLP provided optimal performance, showing a high sedimentation volume (0.92 on Day 1), excellent redispersibility (4 inversions), and suitable viscosity (307 cps), with a stable pH (~6.67) and turbidity profile. FTIR spectra confirmed the absence of any significant chemical interaction between paracetamol and JLP, indicating compatibility and stability of the formulation. This study demonstrates that JLP can effectively act as a natural flocculating agent, offering performance comparable or superior to tragacanth while also being sustainable, cost-effective, and environmentally friendly. Its potential in pharmaceutical suspension systems aligns with the principles of green pharmacy and circular economy. Further exploration into its long-term stability, toxicity profile, and industrial scalability may pave the way for its application as a novel excipient in commercial pharmaceutical formulations.