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Design and Optimization of Fast Disintegrating Tablets for Anti Emetic Drugs Using Natural Super Disintegrants

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Abstract: *The present study aims to design and optimize fast disintegrating tablets (FDTs) of anti-emetic drugs—Domperidone, Metoclopramide HCl, and Ondansetron HCl—using natural superdisintegrants, Plantago ovata and Ocimum basilicum seed mucilages. Natural polymers were isolated, purified, and evaluated for key physicochemical properties, including solubility, swelling ratio, total ash, bulk/tapped density, angle of repose, Carr's index, and Hausner's ratio. These parameters confirmed their suitability as effective disintegrants with good flow properties and swelling capacity. Tablets were formulated via direct compression and wet granulation techniques using different excipients such as Mannitol, MCC, cross-povidone, and lactose. Evaluation of tablets included physical properties (hardness, friability, thickness, weight variation), drug content, in vitro dispersion time, wetting time, water absorption ratio, and dissolution studies. Plantago ovata mucilage exhibited higher swelling and compressibility, while Ocimum basilicum showed better flow and density properties. Among the formulations, tablets prepared using direct compression with natural superdisintegrants showed rapid dispersion (<30 seconds), shorter wetting time, and enhanced drug release profiles compared to wet granulated tablets and marketed formulations. Dissolution studies demonstrated that tablets with natural mucilage exhibited faster and complete drug release, confirming their utility in enhancing bioavailability and patient compliance. Overall, this study validates the potential of Plantago ovata and Ocimum basilicum mucilage as eco-friendly, cost-effective, and efficient natural superdisintegrants for developing FDTs of anti-emetic drugs.*

Keywords: *Fast disintegrating tablets, Domperidone, Metoclopramide HCl, Ondansetron HCl, Plantago ovata, Ocimum basilicum, natural superdisintegrants, wetting time, dispersion time, mucilage*

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