IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 7, May 2025
Impact Factor: 7.67

Natural Superdisintegrants in the Formulation of Fast Disintegrating Tablets: A Comprehensive Review

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Abstract: *Fast disintegrating tablets (FDTs) have gained significant attention in pharmaceutical development due to their rapid onset of action, ease of administration, and improved patient compliance, particularly among pediatric and geriatric populations. The efficacy of FDTs largely depends on the incorporation of effective superdisintegrants, which facilitate rapid tablet breakup and drug release upon contact with saliva. While synthetic superdisintegrants such as croscarmellose sodium and sodium starch glycolate are widely used, their limitations including potential toxicity, environmental concerns, and high cost have led to increased interest in natural alternatives. This comprehensive review explores the role of natural superdisintegrants derived from plant sources, emphasizing their advantages such as biocompatibility, biodegradability, cost-effectiveness, and eco-friendliness. Detailed analyses of commonly used natural superdisintegrants including Plantago ovata (Isapghula husk), Lepidium sativum (Garden cress), fenugreek seed mucilage, guar gum, and others are presented with respect to their source, extraction methods, physicochemical properties, mechanisms of action, effective concentrations, and reported efficacy in FDT formulations. The review also discusses critical evaluation parameters for FDTs, comparative studies between natural and synthetic disintegrants, and addresses challenges such as batch variability, microbial contamination, and regulatory hurdles. Overall, natural superdisintegrants represent a promising, sustainable alternative in FDT formulation, with ongoing research needed to overcome limitations and optimize their pharmaceutical utility*

Keywords: Fast disintegrating tablets, natural superdisintegrants, Plantago ovata, fenugreek mucilage, biocompatibility, tablet disintegration, green synthesis, pharmaceutical excipients

DOI: 10.48175/568