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 6, Issue 2, January 2026
Impact Factor: 7.67

Development of Sustained-Release Capsules Using Natural Polymers

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Abstract: *The study focuses on the formulation of sustained-release capsules using natural polymers as alternative matrix-forming agents. The aim was to develop a delivery system capable of maintaining a controlled drug-release profile while improving stability and minimizing dosing frequency. Various natural polymers—such as sodium alginate, chitosan, and guar gum—were evaluated for their gel-forming ability, compatibility with the active ingredient, and influence on release kinetics. Capsules were prepared using polymer blends at different ratios, and their physical properties, encapsulation efficiency, and in-vitro release behavior were assessed. Results demonstrated that natural polymers can effectively modulate drug release, producing a sustained-release pattern over an extended period. The findings indicate that these biopolymers are promising, safe, and eco-friendly materials for developing sustained-release oral dosage forms.*

Keywords: Sustained release, Natural polymers, Capsule formulation, Drug delivery, Sodium alginate, Chitosan, Guar gum, Release kinetics, Biopolymer matrices

DOI: 10.48175/IJARSCT-30857