



राष्ट्रीय औषधीय शिक्षा एवं अनुसंधान संस्थान, अहमदाबाद
(औषध विभाग, रसायन एवं उर्वरक मंत्रालय, भारत सरकार)

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Citation summary of research work

Dry eye syndrome (DES) is a significant ocular condition affecting millions worldwide, often leading to discomfort and impaired vision. This research introduces a novel therapeutic approach for DES management through the development of ocular inserts, leveraging cutting-edge technologies such as hot-melt extrusion (HME) and the CaliCut post-extrusion system. The ocular inserts incorporate hydroxypropyl cellulose (HPC), polyethylene glycol (PEG), castor oil, and dexamethasone, ensuring sustained drug release and improved therapeutic efficacy. The use of HME, a solvent-free and highly scalable technique, alongside the CaliCut post-extrusion system, ensures precise control over the drug delivery system, enhancing the quality and consistency of the ocular inserts. Comprehensive in vitro studies characterized the physicochemical properties and drug release profiles, demonstrating the formulation's stability and effectiveness. The in vivo testing in animal models confirmed the therapeutic potential and safety of the ocular inserts, showing significant improvements in managing DES symptoms.

This research work undertaken by Dhvani Rana, stands out due to its novel approach in integrating advanced formulation strategies with innovative manufacturing technologies. The developed ocular inserts offer an innovative solution for DES, characterized by enhanced patient comfort and compliance due to the preservative-free, sustained release formulation, and improved therapeutic outcomes, potentially transforming the standard of care for DES patients. The innovative combination of HME and CaliCut technologies in the development of ocular inserts for DES represents a significant advancement in ocular drug delivery, addressing a critical medical need and setting a new benchmark in the field of ophthalmic therapeutics.



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