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RESEARCH ARTICLE

Tailoring Vilazodone Hydrochloride Delivery Systems with Natural Superdisintegrants for Enhanced Bioavailability

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ABSTRACT:
The work presented below aimed to successful development of optimized fast dissolving tablet of vilazodone hydrochloride with natural superdisintegrants prepared by *Lepidum Sativum* Seed using "Quality by Design". Central composite design was used to optimize the tablet formulation which was compressed by direct compression followed by sublimation technique with additive effect of natural super disintegrant The impact of independent variables i.e. natural super-disintegrant and sublimating agent at different concentration was determined on dependent variables like wetting time, disintegration time and drug release. The optimized batches were developed after validation using overlay plot technique of design expert, passes all the physical evaluation of tablets, it passes the compatibility studies as shown by FTIR, XRD and DSC TGA. Tablet also showed minimum wetting time, disintegration time and maximum the drug release in 5 m.. The developed optimized formulation employing CCD shows no significant changes during one month stability studies. This present work results in a completion with the development of compressed tablets for vilazodone hydrochloride with high porosity that dissolve rapidly in mouth to improve patient compliance and could be industrially feasible.

KEYWORDS: Fast Dissolving Tablet, *Lepidum Sativum* Seed, Mucilage, Thymol, central composite design.

INTRODUCTION:
A fast-dissolving drug delivery system (FDDS) is a dosage form that rapidly disintegrates in saliva within seconds when placed on the tongue, eliminating the need for water or chewing.[1]. Despite of tremendous development. In drug delivery systems, the oral route is favored for drug administration because of its numerous advantagesIn drug delivery systems, the oral route is favored for drug administration due to its numerous advantages, including low therapy costs, ease of administration, accurate dosing, suitability for self-medication, avoidance of pain, versatility, and, most importantly, high patient compliance. Fast dissolving tablets (FDTs) have been developed to cater to the needs of pediatric, geriatric, and bedridden patients, as well as active individuals who are busy or traveling and may not have access to water.

Tablets and capsules are widely accepted dosage forms; however, a significant drawback is dysphagia, or difficulty swallowing. This issue has led to the development of novel solid dosage forms, such as FDTs, which disintegrate and dissolve rapidly in saliva without the need for drinking water. Vilazodone Hydrochloride (VH) an antidepressant agent was approved by US Food and Drug Administration (US FDA) in 2011[4]. Through VH is absorbed after oral intake but has a bioavailability of only 72%. However, FDTs can increase bioavailability by allowing pre-gastric absorption of the drug from the mouth, pharynx, and esophagus as saliva carries it to the stomach. Therefore, an attempt was made to formulate and optimize FDTs using central composite design (CCD) to achieve a quicker onset of action. This was done by varying the concentrations of thymol (THY) as a sublimating agent and Lepidium sativum seed mucilage (LSSM) as a super disintegrant[7].