



Determination of floating ability of *Ocimum tenuiflorum* Linn seed mucilage isolated by defatting method

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ABSTRACT

The aim of present study was to determine the floating ability of seed mucilage of *Ocimum Tenuiflorum* Linn. The mucilage was isolated by defatting method. Four tablet formulations of model drug diltiazem HCl were prepared using *Ocimum Tenuiflorum* Linn seed mucilage in varying concentrations of floating agent. The formulations were evaluated for buoyancy lag time but tablets did not float. The *Ocimum Tenuiflorum* Linn seed mucilage used alone as a floating agent failed to show floating ability. However it may show floating property if combined with other floating polymers.

Keywords: Seed mucilage, Floating ability, Defatting method, Diltiazem HCl.

INTRODUCTION

A number of natural excipients for delivering the bioactive agents are replacing the synthetic materials. Today we have several pharmaceutical excipients of plant origin like starch, agar, alginates, carrageenan, guar gum, xanthan gum, gelatin, pectin, acacia, tragacanth, and cellulose. These natural excipients find applications in the pharmaceutical industry as binding agents, disintegrants, sustaining agents, protectives, colloids, thickening agents, gelling agents, bases in suppositories, stabilizers and coating materials. The advantages of natural plant-based excipients include that they are of low cost, natural origin, fairly free from side effects, biocompatible and bio-acceptable, with a renewable source, environmental friendly processing, local availability, better patient tolerance, as well as public acceptance [1].

EXPERIMENTAL SECTION

After reviewing literature, it was found that the plant *Ocimum Tenuiflorum* Linn was not studied for its mucilage properties. So this plant was selected for the research work. The plant was studied for its seed mucilage isolated by defatting method.

The *Ocimum Tenuiflorum* Linn seeds were blended and kept in contact with petroleum ether in Soxhlet apparatus. The cycles of petroleum ether were run till complete defatting is obtained. The defatted material was then dried at room temperature for complete removal of petroleum ether. The dried defatted seed powder was then soaked in distilled water. The swollen wet mass was then spread on the glass tray and dried at 60°C. The dried material was then passed through mesh #30. The material was winnowed and again passed through mesh #60. The weight of mucilage obtained was recorded. The mucilage obtained was stored in desiccators until use in further studies [2].

While carrying out certain evaluations, we found that the mucilage was floating on water (Fig.1). From this observation it was expected that it can be used as floating agent for formulating gastro-retentive drug delivery system.



Fig.1 Mucilage floating on the water surface

For proving its floating property the present study was undertaken. Diltiazem HCl, a potential candidate for gastro-retention, was selected as model drug. Compatibility of mucilage and drug was determined by performing Differential Scanning Calorimetry (DSC) (Mettler) [3] and Fourier Transform Infrared Spectroscopy (FTIR) (Jasco 4100) [4]. The spectra are shown in Fig.2. The drug was found to be compatible with mucilage for use in our study.

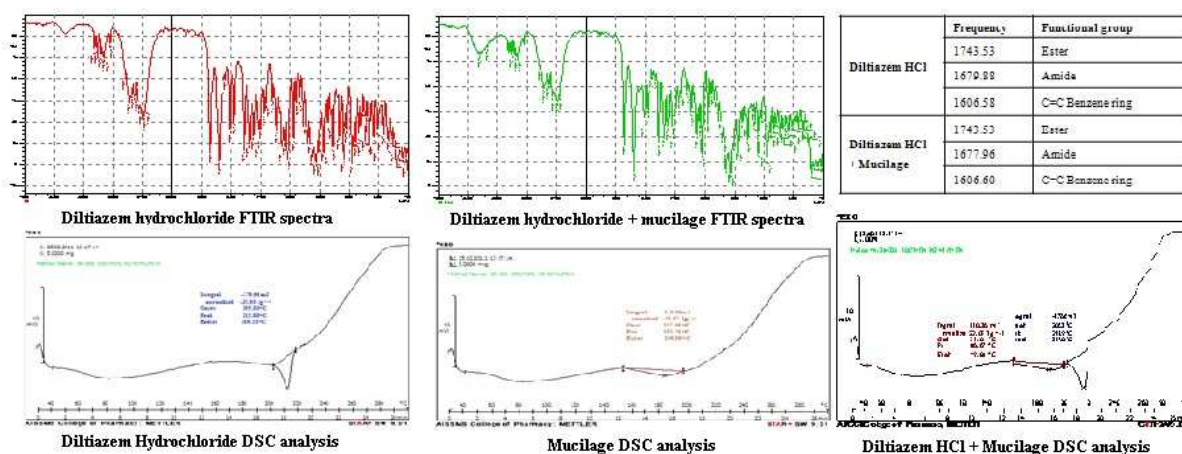


Fig.2 Compatibility of mucilage and drug by DSC and FTIR

To study the floating effect of mucilage, various tablet formulations were prepared on the trial and error basis. Four tablet formulations of mucilage in concentration range of 21.73 to 66.03 % were prepared by wet granulation method. Table 1 shows composition of the formulations.

Table 1 Floating tablet formulations using mucilage as floating agent

Sr. no.	Ingredients	F1 (mg)	F2 (mg)	F3 (mg)	F4 (mg)
1	Diltiazem HCl	30	30	30	30
2	Mucilage	50	100	200	350
3	Lactose	50	50	50	50
4	MCC	60	60	60	60
5	Talc	20	20	20	20
6	Mg. St.	20	20	20	20
	Total	230	280	380	530

All the ingredients with drug were weighed accurately and mixed properly in mortar. Ethanol (50% v/v) was used to moisten the powder to form a damp coherent mass. The damp mass was then passed through the sieve to form the granules which were then dried in the oven at 60°C. The weighed granules were compressed on the 8-Station Rotary Tablet Machine (CIP, D8 Lab press, Ahmadabad). Using flat faced punch and die of diameter 8 mm (for F1, F2, F3) and 10 mm (for F4). The hardness was kept between 6 to 9 kg/cm².

The tablets were evaluated for buoyancy lag time (BLT), Total Floating Time (TFT), matrix integrity after floating by placing in 500 ml of distilled water [5]. The tablets did not float even after 30 minutes and started disintegrating after 1 hr (Fig.3).



Fig.3 No tablet floats on water

RESULT AND DISCUSSION

The mucilage alone failed to show floating characteristics but it might show good results in combination of other floating polymers. Further study is needed to determine if mucilage shows floating property when used in combination of other floating polymers.

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