COMPARITIVE ASSAY OF RED AND YELLOW HIBUSCUS ROSA SINENSIS LINN FLOWER MUCILAGE AS EXCIPIENT

R. S. A. Sorna Kumar*, J. Anusiya Deepika and K. Manjula Devi

Department of Biotechnology, P.S.R Engineering College, Sivakasi-626140, Tamil Nadu.

ABSTRACT

Hibiscus rosasinensis L are used traditionally as medicines in emollients and aperients to treat burning sensations, skin disease, and constipation. Mucilage of Hibiscus rosasinensis contains L-rhamnose, D-galactose, D-galactouronic acid, and D-glucuronic acid. The present study aimed at extraction of mucilage from the flowers of red and yellow Hibiscus rosasinensis Linn and examining the properties of the dried mucilage as an excipient. Based on the studies done, we found that both the flower mucilage of yellow and red flower showed considerably similar results. It can also be said that like mucilage from leaves, flower mucilages of Hibiscus rosasinensis L has the potential of being used in slow releasing GIT drugs.

KEYWORDS: Flower, Hibiscus rosasinensis L, excipient, tablet.

INTRODUCTION

Hibiscus rosasinensis Linn belongs to Malvaceae family is also known as the shoe-flower plant or China rose. The plant is available in India in large quantities, and the leaves and flowers contain mucilage.[1,2] The leaves of Hibiscus rosasinensis L are used traditionally as medicines in emollients and aperients to treat burning sensations, skin disease, and constipation.[3] Mucilage is glutinous substance which mainly consists of polysaccharides, proteins and uranides. Mucilage of Hibiscus rosasinensis contains L-rhamnose, D-galactose, D-galactouronic acid, and D-glucuronic acid.[4] Analysis of the edible part of flowers gave the following value such as moisture 89.8; nitrogen 0.064, fat 0.36, crude fibre 1.56 %, calcium 4.04, phosphorus 26.68, iron 1.69 mg / 100gm.[5] Flvones from red flowers,
quercetin-3,5-diglucoside, quercetin-3,7-diglucoside, cyanidin-3,5-diglucoside and cyaniding-3-sophoroside-3,5-glucoside from deep yellow flowers.[6]

The present study aims at extraction of mucilage from the flowers of red and yellow Hibiscus rosasinensis Linn and examining the properties of the dried mucilage as an excipient.

**MATERIALS AND METHOD**

**Collection of mucilage.**

Red and yellow flower of Hibiscus rosasinensis L. were procured from local market and were washed in clean water. The flowers were shade dried and powdered. 100g of powder was soaked in 500ml of water for 2h after which it was boiled for 1h and was left to stand for another 3h. It was then filtered using muslin cloth and thrice the volume of acetone was added. The precipitate was collected after 3h and dried at 40°C in hot air oven. This was then powdered and used for further studies.[7]

**Formulation of tablets**

Dispersible tablets of paracetamol were prepared by wet granulation technique using the mucilage powder at concentration of 5 and 10%. All the ingredients were weighed and passed through Size 40# sieve. The mixture was blend in a double cone blender for 20 mins and was compressed on a Cadmach single-stroke punch machine.

**Table 1: Composition of tablet.**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>RED FLOWER MUCILAGE</th>
<th>YELLOW FLOWER MUCILAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Red 5%</td>
<td>Red 10%</td>
</tr>
<tr>
<td>Paracetamol</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Lactose</td>
<td>80</td>
<td>70</td>
</tr>
<tr>
<td>Sodium starch glycolate</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Mucilage</td>
<td>10</td>
<td>20</td>
</tr>
</tbody>
</table>

**Evaluation of dispersible tablets**

Tablets were evaluated for their thickness, bulk density, tapped density disintegration time, and dissolution. In weight variation test, twenty tablets were randomly selected and average weight was determined using an electronic balance. Thickness of tablet was determined by using Verner calliper. To measure wetting time of tablet, a piece of tissue paper was folded twice and placed in a small Petri dish containing sufficient water. A tablet was kept on the
paper and the time for complete wetting of tablet was measured. Disintegration time was
determined using USP tablet disintegration test using 900 ml of distilled water at 37°C.

**Disintegration and wetting time studies**

The disintegration time and wetting time of the tablets was determined using phosphate
buffer solution at pH 5.8 at 37±0.5°C.

**Dissolution Study**

*In vitro* release of paracetamol from tablets was monitored by using 900 ml of SIF (phosphate
buffer solution, pH 5.8) at 37±0.5°C and 75 rpm using programmable Paddle type dissolution
tester. Aliquots were withdrawn at 5-minute time intervals and were replenished immediately
with the same volume of fresh buffer medium. Aliquots, following suitable dilutions, were
assayed spectrophotometric ally at 274 nm.

**RESULTS AND DISCUSSIONS**

Both the mucilages were slightly soluble in water and was practically insoluble in ethanol,
acetone and chloroform. A 1% w/v solution of yellow flower mucilage and red flower
mucilage in water showed a pH of 6.8 and 7.1, which is near to the neutral pH. This suggest
that both the mucilages may be less irritating to the GIT, when used in the uncoated tablets.\(^8\)

Various properties of the prepared drugs were studied and the results tabulated. yellow flower
mucilage and red flower mucilage

**Table 2: characteristics of prepared tablets.**

<table>
<thead>
<tr>
<th>Samples</th>
<th>Thickness (mm)</th>
<th>Bulk density (g/ml)</th>
<th>Tapped density (g/ml)</th>
<th>Disintegration time (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red 5%</td>
<td>4±2.3</td>
<td>0.362</td>
<td>0.512</td>
<td>3.58</td>
</tr>
<tr>
<td>Red 10%</td>
<td>4±1.4</td>
<td>0.348</td>
<td>0.492</td>
<td>4.34</td>
</tr>
<tr>
<td>Yellow 5%</td>
<td>4±3.4</td>
<td>0.376</td>
<td>0.531</td>
<td>3.72</td>
</tr>
<tr>
<td>Yellow 10%</td>
<td>4±1.4</td>
<td>0.341</td>
<td>0.487</td>
<td>4.28</td>
</tr>
</tbody>
</table>

All the characterization parameters for the prepared granules using different concentration of
binders were found to be within the acceptable limit. And the granules were found to have
good flow properties and are suitable for tableting. The prepared granules were then
compressed to form tablets and these tablets were evaluated by the different parameters as
given in Table 1. All the batches of tablets exhibited good content uniformity. The
disintegration time of tablet was found to increase with increase in the concentration of
mucilage. The dissolution studies were performed by using paddle type apparatus at 50 rpm in a phosphate buffer medium of pH 5.8 at 37±1°C at the pre-determined interval of time. Both the flower mucilage showed considerably similar results.

![Drug Dissolution Study](image)

**Figure 1: Drug Dissolution.**

**CONCLUSION**

Based on the studies done, we found that both the flower mucilage of yellow and red flower showed considerably similar results. It can also be said that like mucilage from leaves, flower mucilages of *Hibiscus rosasinensis* L has the potential of being used in slow releasing GIT drugs.

**REFERENCES**

