POLYHERBAL CHEWABLE HERBAL TABLETS FOR COUGH REMEDY: DEVELOPMENT AND EVALUATION

Sumalatha G¹ and Jayapal Reddy G²

¹ Department of Pharmacognosy, Vaagdevi college of Pharmacy, Hanamkonda, Telangana, INDIA.
² Talla Padmavathi College of Pharmacy, Orus, Kareemabad, Warangal, Andhra Pradesh, India-506002.

*Corresponding Author Email: sumalatha2k@gmail.com

ABSTRACT

The present study aimed at the formulation and evaluation of polyherbal chewable tablets for cough remedy. Plants have always been an exemplary source of drugs and many of the currently available drugs have been derived directly or indirectly from them. Following all data and knowledge chewable tablet for cough remedy was prepared using Liquorice (Glycyrrhiza glabra), Ginger (Zingiber officinale), Black pepper, Tulsi (Ocimum sanctum), Pudina (Mentha piperita), Fennel (Foeniculum vulgare), Cinnamon (Cinnamomum zeylanicum), Clove (Eugenia caryophyllus) Ajowan and Amla with 10% starch as a binding agent. Development of chewable herbal tablets for cough remedy is important to meet better patient compliance. Chewable herbal tablets were prepared by wet granulation technique by using Starch (10%w/v) as a binding agent. Tablets were evaluated for weight variation test, friability, hardness; time required for complete chewing and is found to be in acceptable limits. DSC and FTIR spectral studies showed that there is no interaction between the excipients. In conclusion, development of chewable herbal tablets are protecting from cough. Our data confirm that the selected formulation of chewable herbal tablets has acceptable physicochemical features and may be considered as herbal medication for cough remedy. Further, the efficacy of the developed formulations is compared with standard marketed formulations.

KEY WORDS
Polyherbal, Chewable, Tablets

INTRODUCTION

Herbal medicine is the oldest form of healthcare known to mankind. In India, indigenous remedies have been used in the treatment of cough and cold since the time of Charka and Sushruta (6th century BC). Plants have always been an exemplary source of drugs and many of the currently available drugs have been derived directly or indirectly from them. Amongst, people used to chew tulsi leaves in case of cough, it is a good remedy. Ginger powder is another important constituent in Ayurveda, herbal and unani preparation. Generally a drop of ginger oil or a few slices of fresh rhizome may also be placed in steaming water and inhaled which is best household remedy for cough and cold. Black pepper use widely in all over world as a stimulant, expectorant properties and it is used in cold, fever etc. Following all data and knowledge we have tried a chewable tablet containing all these ingredients in powder from in the varying proportions. The present study aimed at the formulation and evaluation of polyherbal chewable tablets for cough remedy.

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Sumalatha G* and Jayapal Reddy G

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Experimental Methods
Preparation of chewable tablet
The granules are prepared by wet granulation. It involves weighing all the ingredients, preparing a damp mass by using 10% starch solution, screening the damp mass into granules by passing through sieve no. 14, drying of granules and blending and tablet formation by 8 station rotary press tablet compression machine.\(^5\)

Evaluation of granules:
Angle of repose
The angle of repose is a relatively simple technique for estimation of the flow property of a powder. The angle of repose was calculated by using the formula\(^7\)

\[
\text{Angle of repose } (\theta) = \tan^{-1} \left( \frac{\text{height}}{\text{radius}} \right)
\]

Carr’s compressibility index
The Carr’s compressibility index was calculated by calculating the tapped and bulk density using the 100-ml measuring cylinder. Compressibility is calculated by the formula,

\[
C = 100 \times (1 - \frac{\rho_B}{\rho_T})
\]

A carr’s index greater than 25 is considered to be an indication of poor flowability, and below 15, of good flowability

Particle Size distribution
The particle size distribution of granules was evaluated by sieve analysis using standard sieves in the range of sieve no. 10-36.\(^8\)

Evaluation of tablets
Friability
The test is performed by using Roche friabilator. Initial weight–final weight/initial weight × 100

Hardness
The hardness test is performed to provide a measure of tablet strength. The Pfizer tester is commonly used.

Organelopic properties
The colour, odour and taste characteristics were evaluated.

Diameter and Thickness
It was measured by using vernier calliper scale.\(^9\)

Weight variation
The USP weight variation test is run by weighing 20 tablets individually and comparing individual weight to the average. The tablets meet the USP test if no more than 2 tablets are outside the percentage limit and if no tablet differs by more than 2 times the percentage limit.\(^10\)

Results and Discussion: Evaluation of granules
The granules thus prepared were evaluated and the results thus obtained are given in Table 1. As granules have the angle of repose (before adding lubricant & after adding lubricant) value less than 27°, show excellent flow. The hausner’s ratio value was found to be less than 1.25 which indicates excellent flowability. As value of % compressibility is found to be 16.7%, it indicates good flowability. Average particle size was found to be in the range of 548-665 µm. The drug release from above formulation followed zero order profile and the mechanism of drug release followed non fickian release.

Evaluation of tablets
The tablets thus prepared were evaluated and the results thus obtained are given in Table 2. Organoleptic properties like color, odor and taste were found to be acceptable. Tablets showed % weight variation within given limits (< 5%). Friability was found to be 1.72%. Hardness value was found to be in the range of 5.5 – 6.0 kg/cm\(^2\). Disintegration i.e., Time required for complete chewing ranges from 15-20 min.
Table 1: Evaluation of granule

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angle of Repose</td>
<td>26.5</td>
</tr>
<tr>
<td>Bulk density</td>
<td>0.374gm/ml</td>
</tr>
<tr>
<td>Tapped density</td>
<td>0.449gm/ml</td>
</tr>
<tr>
<td>Carr's index</td>
<td>16.7%</td>
</tr>
<tr>
<td>Hausner ratio</td>
<td>0.83</td>
</tr>
<tr>
<td>Type of flow</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

Table 2: Evaluation of tablets

<table>
<thead>
<tr>
<th>Sr.no</th>
<th>Parameter</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Color</td>
<td>Yellowish green</td>
</tr>
<tr>
<td>2</td>
<td>Odour</td>
<td>Good</td>
</tr>
<tr>
<td>3</td>
<td>Taste</td>
<td>Good</td>
</tr>
<tr>
<td>4</td>
<td>Diameter(cm)</td>
<td>0.9mm</td>
</tr>
<tr>
<td>5</td>
<td>Thickness(cm)</td>
<td>0.5mm</td>
</tr>
<tr>
<td>6</td>
<td>Weight variation test</td>
<td>Tablet complies as per specification</td>
</tr>
<tr>
<td>7</td>
<td>Friability Test</td>
<td>1.72%</td>
</tr>
<tr>
<td>8</td>
<td>Hardness Test</td>
<td>5.5-6.0kg/cm²</td>
</tr>
<tr>
<td>9</td>
<td>Time required for complete chewing</td>
<td>10-15min</td>
</tr>
</tbody>
</table>

Conclusion

The evaluation of granules and tablets indicate successful formulation of chewable tablet. Chewable tablet is with minimum disintegration time, sufficient hardness, pleasant taste and meeting all official limits. Therefore, this can be the formulation for paediatric use in future.

References

*Corresponding Author:
Sumalatha G*
Department of Pharmacognosy,
Jangaon Institute of Pharmaceutical Sciences,
Yashwanthapur, Jangaon, Telangana, India.
Email: sumalatha2k@gmail.com