

## FORMULATION AND EVALUATION OF TASTE MASKED CHEWABLE HERBAL TABLET FOR COUGH REMEDY

Kashikar V.S.<sup>1\*</sup>, Patkar Pooja<sup>2</sup>

Modern College of Pharmacy (Ladies), Moshi Pune, (M.H.) India

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### ABSTRACT

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 Charaka 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. The many herbal remedy is available in the common lady kitchen. Following all data and knowledge taste masked chewable tablet was prepared using tulsi powder, Ginger powder, Black pepper powder, Clove powder, Nutmeg powder, Cinnamon powder and Cardamom powder with hydroxyl propyl methyl cellulose (HPMC 0.1%w/w) as a taste masking agent. Tablet were evaluated for Weight variation test, Friability, Hardness and Time required for complete chewing and are found to be in acceptable limits.

**KEYWORDS:** Chewable tablet, Tulsi powder, Ginger powder, Black pepper powder, Clove powder, Nutmeg powder, Cinnamon powder

### \*Address for Correspondence

Kashikar Vrushali S., Dept. of Pharmaceutics, Modern College of Pharmacy (Ladies), Moshi Pune, (M.H.) India

Email: [vrushalipharma@indiatimes.com](mailto:vrushalipharma@indiatimes.com)

### 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 Charaka 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. The many herbal remedy is available in the common lady kitchen. Amongst, people used to chew tulsi leaves in case of cough, it is a good remedy. Rama tulsi is the effective remedy for the severe acute respiratory syndrome. Tulsi leaves while preparing tea keeps one free from cough and cold and other ailments associated with 'kapha dosha' in the body. Ginger powder is another important constituent in Ayurveda, herbal and unani preparation. Ginger tea is mostly use for running nose. 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. Nutmeg contains essential oil used in cough syrups because it reduces congestion due to colds. Following all data and knowledge we have tried

a chewable tablet containing all these ingredients in powder form in the varying proportions<sup>1-4</sup>.

### MATERIALS AND METHODS

Fresh tulsi leaves were collected from the botanical garden of the institute, shade dried and powdered. Ginger powder, Black pepper powder, Clove powder, Nutmeg powder, Cinnamon powder were prepared using a mixer grinder.

#### Formulation of chewable tablet

The formulation was prepared in a stepwise manner as follows,

#### Preparation of taste masked material

It involves preparation of dispersion of all active ingredients in distilled water and boiling. To this boiled dispersion hydroxyl propyl methyl cellulose (HPMC 0.1%w/w) was added as a taste masking agent with constant stirring. The prepared mass was dried, powder was collected and stored. Taste masked powdered was further evaluated for, taste and mouth feel.

#### Preparation of chewable tablet

The granules are prepared by wet granulation. It involves weighing of taste masked powder obtained from first step, preparing a damp mass, screening the damp mass into granules by passing through sieve no.14, drying of

granules, adding lubricant (magnesium stearate) and blending and tablet formation by 8 station rotary press tablet compression machine. (CIP Machinery)<sup>5-6</sup>

### Evaluation of granules

#### Angle of repose

The angle of repose is a relatively simple technique for estimation of the flow property of a powder. Powders with low angle of repose are free flowing and those with a high angle of repose are poorly flowing powders. 10 gm of granules were passed through funnel and the pile was formed. The angle of repose was calculated by using the formula

Angle of repose ( $\theta$ ) =  $\tan^{-1}$  height /radius

#### 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,

$$C = 100 \times (1 - \rho_B/\rho_T)$$

where  $\rho_B$  is the freely settled bulk density of the powder, and  $\rho_T$  is the tapped bulk density of the powder. A carr's index greater than 25 is considered to be an indication of poor flowability, and below 15, of good flowability<sup>5-6</sup>

#### 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. The fraction was collected and weighed<sup>7-8</sup>.

#### Evaluation of tablets

##### Friability

The test is performed by using Roche friabilator.

Initial weight- final weight/initial weight  $\times 100$

##### Hardness

The hardness test is performed to provide a measure of tablet strength. Tablets should be hard enough to withstand packaging and shipping but not so hard as to create undue difficulty upon chewing. Tablet hardness is determined using equipment from various suppliers that measure the force needed to break up the tablets. The Pfizer tester is commonly used.

##### Organoleptic properties

The colour, odour and taste characteristics were evaluated.

##### Diameter and Thickness

It was measured by using vernier calliper scale.

##### 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.

The weight variation tolerances for uncoated tablets differ depending on average tablet weight<sup>5,9-10</sup>.

FTIR study was carried out to check the compatibility of the active ingredients and excipients.

## RESULT 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 25°, 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 15.03, it indicates good flowability. Average particle size was found to be in the range of 548-665  $\mu\text{m}$ .

### Evaluation of tablets

The tablets thus prepared were evaluated and the results thus obtained are given in table 3. 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 1.82%. Hardness value was found to be in the range of 3 – 3.5  $\text{kg/cm}^2$ . Disintegration ie Time required for complete chewing ranges from 15-20 min. In FTIR analysis there is no change in peaks which indicate no interaction between drug and excipients resulting in formation of new structure.

## CONCLUSION

The evaluation of granules and tablets indicate successful formulation of chewable tablet.

Chewable tablet are 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

1. Kirtikar KR and Basu BD. Indian medicinal plants Vol.III; 2<sup>nd</sup> ed. International Book Distributors;1999, 2149
2. Rangari VD. Traditional drug of India in Pharmacognosy & Phytochemistry Part II, 1<sup>st</sup> ed. Career Publication; 2008, 251
3. Kokate CK., Purohit PA, Gokhale SB. 42<sup>nd</sup> ed. Nirali Prakashan; 2008, 11,53
4. Mohammad Ali. Text book of Pharmacognosy 2<sup>nd</sup> ed. CBS Publishers; 2006,261
5. Lachman L, Liberman HA and Kanig JL. The Theory and Practice of Industrial pharmacy, 3rd edition, Bombay: Varghese Publishing House, 1987, pp. 329- 335.
6. Liberman HA, Lachman L and Schwartz JB. Pharmaceutical Dosage forms: Tablets, second edition, New York: Marcel Dekker Inc., 1989, pp. 367-414
7. Gaud RS, Yeole PG, Yadav AV and Gokhale SB, A Textbook of Pharmaceutics, 9th edition, pune: Nirali Prakashan, 2007, pp. 9.
8. Allen LV, Popovich GN, Ansel HC, Ansel's pharmaceutical dosage forms and drug delivery systems, 8<sup>th</sup> edition, Lippincott Williams and Wilkins, 2005, pp.240,246.

9. Suzuki H, Onishi H, Takahashi Y, Iwata M and Machida Y. 'Development of oral acetaminophen chewable tablets with inhibited bitter taste', International journal of pharmaceutics, 2003;251:123-132
10. USP 29/NF 24, United state pharmacopoeial convention, Toranto, Asian Edition; pp.1236-1240,2670

**Table 1: Evaluation of granules**

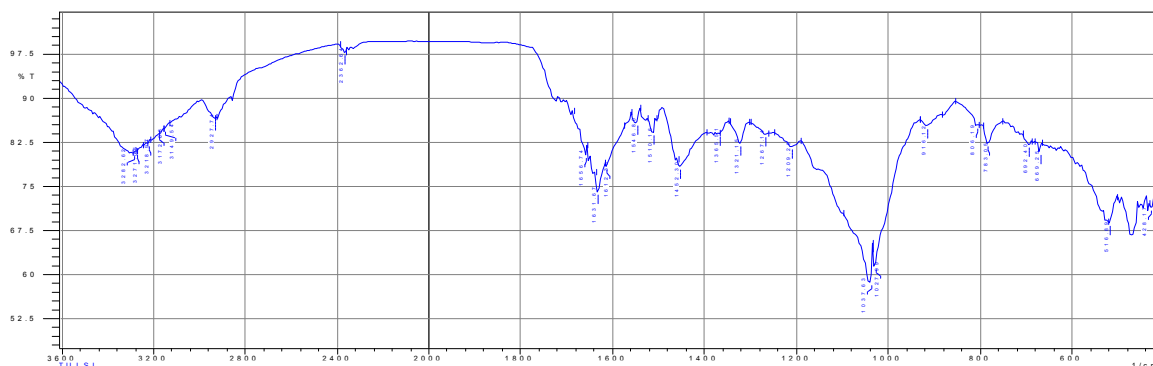
Parameter	Observations
Angle of repose	22°25'
Bulk density	0.373 gm/ml
Tapped density	0.439 gm/ml
Carr's index	15.03%
Hausner's ratio	1.176
Type of flow	Excellent flow

**Table 2: Formulation of chewable tablets**

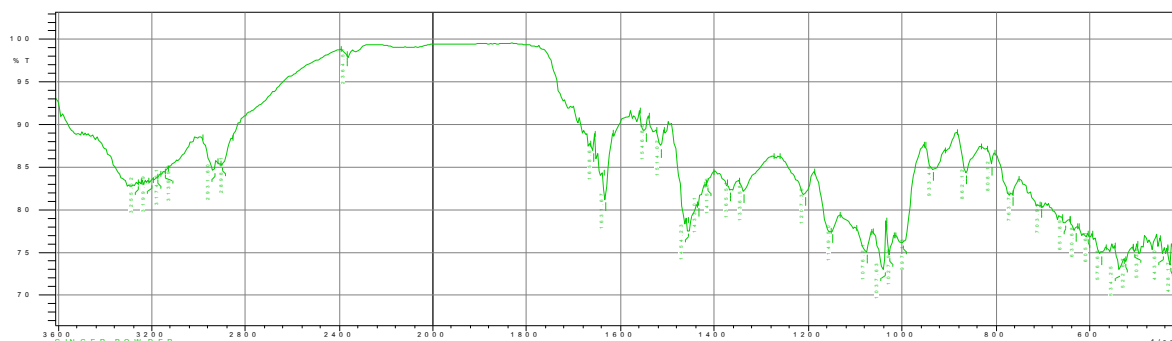
Active Ingredients	Weight in mg
Tulsi powder	100
Ginger powder	10
Black pepper powder	2
Clove powder	1
Nutmeg powder	2
Cinnamon powder	2
Cardamom powder	3
Sodium lauryl sulphate	15
Poly vinyl pyrolidone	10
Lactose	130
Sodium starch glycollate	6.5
Magnesium stearate	10
Starch	40
Sodium saccharin	4
Menthol	5
Total Weight	340.5

**Table 3: Evaluation of tablets**

Sr.No.	Parameter	Observation
1.	Color	Grayish
2.	Odour	Pleasant having a flavor of Cardamom
3.	Taste	Good
4.	Diameter (cm)	0.7 mm±0.05
5.	Thickness (cm)	0.4 mm±0.02
6.	Weight variation test	Tablet complies as per specification.
7.	Friability test	1.82%
8.	Hardness test	3 – 3.5 kg/cm <sup>2</sup>
9.	Time required for complete chewing	15-20 min



**Figure: 1 FTIR of Tulsi**



**Figure: 2 FTIR of Ginger powder**

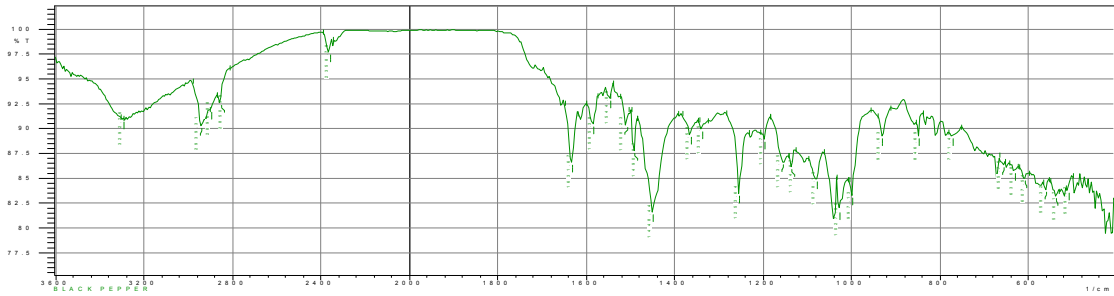


Figure: 3 FTIR of Black pepper powder

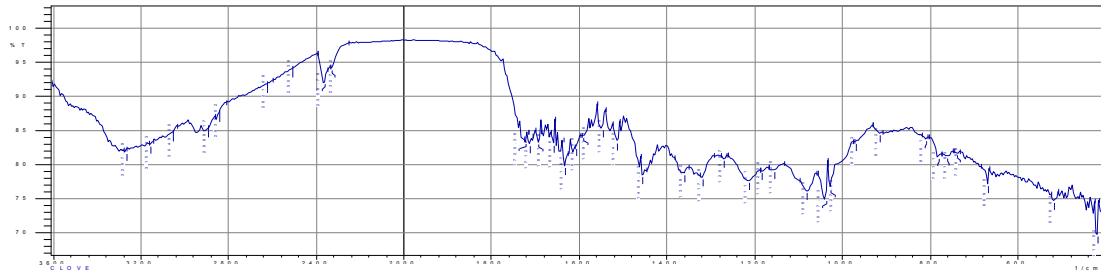


Figure: 4 FTIR of clove powder

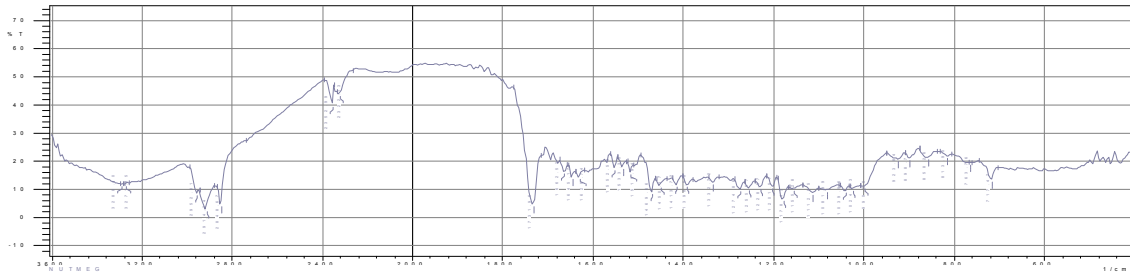


Figure: 5 FTIR of nutmeg powder

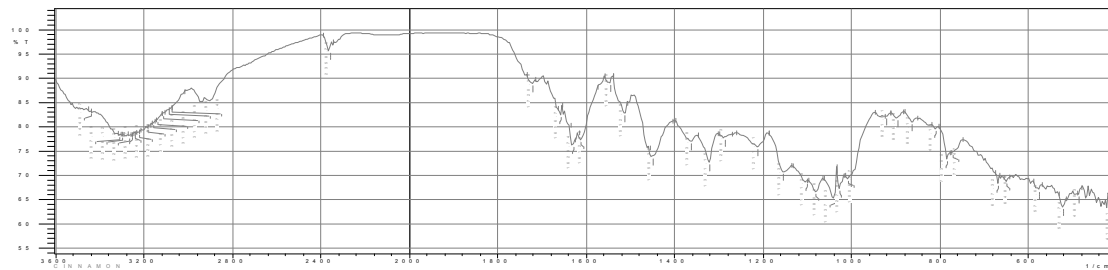


Figure: 6 FTIR of cinnamon powder

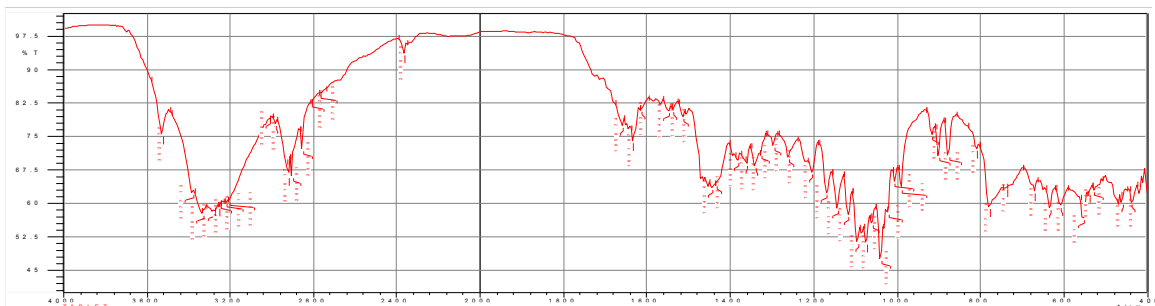


Figure: 7 FTIR of Tablet

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