

## Formulation and evaluation of herbal coughsyrup of ginger by base Jaggery

Mr. P. B. More<sup>1</sup>, Dr. A. S. Kulkarni<sup>2</sup>, Ms. Shivani Shamrao Kekare<sup>3</sup>, Mr. Saurabh Ashok Mali<sup>4</sup>

*Assistant professor, Principal, Student, Student Department of Pharmaceutics  
Ashokrao Mane institute of pharmaceutical sciences and research,*

Submitted: 01-08-2022

Accepted: 07-08-2022

### ABSTRACT –

Medicines presently used to treat cough are among the most extensively used over the counter medicines in the world, despite a recent analysis suggesting that there is a little evidence to similar medicines produce any meaningful efficacy. Syrup is generally useful and popular dosage form which is used for the treatment of cough and cold. We prepared the herbal cough syrup by adding decoction of herbal drugs such as Ginger, tulsi, Liquorice, black pepper, fennel, peppermint, clove and excipients like peppermint oil, methyl paraben with jaggery as a base. The herbal cough syrup is formulated by using decoction method. Adding the decoction of herbal drugs with base of jaggery is helpful to the formulation for thick and preserve the Formulation. That was helpful to increase the shelf life of formulation of herbal syrup. The added jaggery Sweetener can also help to increase the palatability of some herbal drugs. The finally develop the herbal cough syrup with the base of jaggery.

The aim of this Study is to develop a herbal cough syrup and evaluate the parameters such as turbidity, colour, odour, Taste were compared with the changes in accelerated stability testing. Quality of final herbal cough syrup was evaluated with the parameters such as physical appearance like Colour, odour, taste, pH, viscosity.

**KEYWORDS** – Zingiber officinale, Jaggery base, herbal cough syrup, Quality control test

### I. INTRODUCTION –

Ginger (Zingiber officinale) belongs to family Zingiberaceae is an ancient Indian medicine used in several diseases. Zingiber officinale commonly called as ‘Adrak’ in Hindi and Urdu, ‘Sunthi’ in Marathi. It has various names such as Ginger, Adrak, Sunti. Constituents of ginger such as zingerone, shogaol, gingerol, paradol,  $\beta$ -phellandrene, curcumene, cineol, geranyl acetate,

terpineol, terpene, borneol, geranyl, limonene, zingiberol, linalool,  $\alpha$ -zingiberene,  $\beta$ -sesquiphellandrene,  $\beta$ -bisabolene, zingiberenol and  $\alpha$ -farnesene.<sup>[1]</sup>

Ginger act as an antioxidants which are phenolic compounds and vitamin C. Antioxidants compounds have an important role in the human health and are also widely used as food additives to prevent food damage.<sup>[2]</sup>

Herbal cough syrup was prepared by adding decoction of herbal drugs with jaggery as a base. The herbal cough syrup is formulated by using decoction method. Mix Decoction of herbal drugs with base of jaggery helpful to the formulation for thicken and preserve the Formulation. That was helpful to increase the shelf life of formulation. The added jaggery Sweetener can also help to increase the palatability of some herbal drugs.<sup>[3]</sup>

### Advantages of herbal medicine –

- 1) Low cost.
- 2) Easy to obtain than prescription medicine.
- 3) Stabilizes hormones and metabolism.
- 4) Strength in immune system.
- 5) More affordable than conventional medicine.

### Advantages of liquid dosage form –

- 1) Homogeneous liquid.
- 2) Drug is in solution, immediately available for absorption.
- 3) Liquid medications could also be used where solid dosage forms aren't practical to administer.
- 4) Easy to administration.

### Disadvantages of liquid dosage form –

- 1) Shorter life than another dosage forms.
- 2) Less stable.
- 3) Complicated to measure accuracy.
- 4) Liquid is bulky so inconvenience to transport and store.

5) Unpleasant taste and odour.<sup>[4]</sup>

## II. MATERIAL AND METHOD –

Following ingredients are used for the formulation of herbal cough syrup.

SR. NO.	INGREDIENTS	USES
1	Ginger	Anti-inflammatory
2	Tulsi	Antitussive
3	Cardamom	Aromatic
4	Black pepper	Preservative
5	Fennel	Flavoring agent
6	Peppermint	Cooling agent
7	Clove	Expectorant
8	Liquorice	Anti-inflammatory
9	Jaggery	Base

Table 1 List of ingredients



Fig. 1 Ingredient

### Preformulation study of raw material –

#### 1. Moisture content –

- 1) 2gm sample was weighed and taken in petridish.
- 2) Placed the petridish in hot air oven at 100<sup>0</sup>C for 1 hr.
- 3) Allowed to cool and weighed the sample again.
- 4) Calculated the moisture content.<sup>[3]</sup>

#### 2. Determination of ethanol extractive value –

- 1) Taken 5 gm of air dried drug with 100ml of ethanol in a closed flask for 24 hrs.
- 2) Shaken it frequently for 6 hours and then allowed to stand for 18 hrs.
- 3) Then filtered the sample rapidly.
- 4) Then 25 ml filtrate was evaporated in petridish.
- 5) Then dry at 105<sup>0</sup>C and weighed.
- 6) Calculated the ethanol value.<sup>[3,16]</sup>

### 3. Determination of water extractive value –

- 1) Taken 5 gm of air dried drug with 100ml chloroform in 1000ml water (2.5ml of chloroform in 1000ml water) in closed flask for 24 hrs.
- 2) Shaken frequently for first 6 hrs.
- 3) Allowed to stand for 18 hrs.
- 4) Evaporated 25 ml filtrate to dryness in a petridish.
- 5) Dry at 105°C and weighed.
- 6) Calculated the water extractive value.<sup>[3,17]</sup>

### 4. Solubility testing –

- 1) Taken 2 gm of powdered drug into distilled water, ethanol, chloroform, acetone.
- 2) Then examined the solubility of the drug.<sup>[11]</sup>

### 5. TLC (Thin Layer Chromatography) –

- 1) Prepared the slurry (5gm of silica gel G in 12.5 ml of water) then slurry spreaded in TLC plate.
- 2) Then coated plate was placed at air for 30 min and then in hot air oven at 100°C for 30 min.
- 3) Mobile phase (ethanol) suitable poured in TLC chamber and closed the chamber and leaved for some time.
- 4) Then placed TLC plate on the TLC chamber after solvent front gets to the top of plate then removed TLC plate and position of solvent was marked then plate placed in hot air oven at 100°C for 30 min.
- 5) Then diluted sample solution should applied on TLC plate by using capillary tube and placed TLC plate inside the Iodine chamber.
- 6) When sample spots was obtained then removed TLC plate.
- 7) Then measured the distance travelled by solvent and the distance travelled by spots.
- 8) Calculated the RF value.

Formula –

$$R_f \text{ value} = \frac{\text{Distance travelled by components}}{\text{Distance travelled by solvent}}$$

### 6. Determination of total Ash value –

- 1) Weighed the porcelain dish and noted the weight
- 2) Weighed 2gm of powdered drug into dish.
- 3) Heated with a burner using flame about 2cm high and supporting the dish about 7 cm. Heated till vapour almost to be evaporated.
- 4) Then cooled the dish.
- 5) Weighed the Ash value and calculate percentage of total Ash value.<sup>[18]</sup>

### 7. UV spectroscopy method –

- 1) Calibration curve of ginger extract was prepared in methanol at maximum wavelength of 281.40 nm.
- 2) Methanol was used for the preparation of calibration curve.
- 3) 100 mg of crude extract was dissolved in 100 ml of methanol that is treated as stock solution.
- 4) This stock solution was diluted to get different concentrations.
- 5) Final solution was scanned for  $\lambda$  max in range of 200- 400 nm using UV spectrophotometer.<sup>[1]</sup>

### 2.2 Formulation of herbal cough syrup –

#### 1. Method of preparation of decoction –

- 1) 5-2 gm each of herbs was taken.
- 2) Herbs was mixed with 500 ml of water.
- 3) All ingredients was boiled, until total volume become one fourth of previous After boiling extract was cooled and filtered.
- 4) Filtrate was taken to prepare final syrup.



Fig 2 Preparation of Decoction.

**2. Method of preparation of jaggery syrup –**

40 gm of jaggery was dissolved in sufficient water to get 100 ml of concentrated syrup. Then the solution was filtered. There jaggery Syrup was used as vehicle.

**3. Methodology for herbal cough syrup –**

Following steps was involved in the preparation of herbal cough syrup –

- 1) Crude herbs were taken in quantity as mentioned in Table no-3.
- 2) All the herbs were taken in water bath and

added Sufficient water and boiled till 1/3rd part wasleft.

- 3) Syrup solution of varying concentration (40% w/v) was prepared.
- 4) Filtered extract of herbs and jaggery Solution.
- 5) Jaggery solution was add to the filtered extract slowly by continuous stirring.
- 6) Volume was made upto 100 ml, Add preservative and flavor and evaluated it.<sup>[19]</sup>

SR. NO.	INGREDIENTS	QUANTITY
1	Ginger	4 gm
2	Tulsi	2 gm
3	Clove	2 gm
4	Fennel	2 gm
5	Cardamom	2 gm
6	Black pepper	1 gm
7	Liquorice	2 gm
8	Peppermint	1 gm
9	Jaggery	40 %

**Table 2. Formulation of cough syrup**

**III. EVALUATION PARAMETERS OF FORMULATION –**

**1. Colour examination –**

- 1) 2ml of prepared syrup was taken and smelled.
- 2) Then Odour was observed.

**2. Odour examination –**

- 1) 2ml of prepared syrup was taken and smelled.
- 2) Then Odour was observed.

**3. Taste examination –**

A pinch of final syrup was taken and examined the taste of syrup.<sup>[3]</sup>

**4. pH examination –**

- 1) Washed the glass electrode with distilled water and cleaned.
- 2) Placed the electrode in pH 7 buffer solution and set the value of 7 on the pH meter turning the Calibrate knob on the meter.
- 3) Removed the electrode and washed with distilled water and cleaned.
- 4) Placed electrode in the pH 4 buffer solution. Adjust the value.
- 5) Then electrode was placed in the final syrup and pH was observed.<sup>[20]</sup>

**5. Density examination –**

- 1) Cleaned the specific gravity bottle.
- 2) The bottle was washed at least two times with distilled water.
- 3) Measured the weight of empty dry bottle with stopper (w1).
- 4) The bottle was filled with final syrup and placed the stopper, wipe out excess syrup from outside the tube.
- 5) Measure the weight bottle with syrup (w2).
- 6) Calculate weight in grams of syrup (w3).  
Formula for density :

Density of liquid under test (syrup) = weight of syrup under test / volume of final syrup under test = W3/v.

**6. Viscosity examination –**

- 1) Cleaned the Ostwald viscometer with warm chromic acid and if necessary used an organicsolvent such as acetone.
- 2) Placed the viscometer in vertical position on a suitable stand.
- 3) Filled water in dry viscometer up to mark G.
- 4) The time was counted in second for water to flow from mark A to mark B.
- 5) This step was repeated at least 3 times to

- obtained accurate reading.
- 6) Then washes the viscometer with sample liquid and then fill it up to mark A, then observed out the time required for liquid to flow to mark B.<sup>[21]</sup>

Formula for viscosity:

$$\text{Viscosity} = \frac{\text{Density of test liquid} \times \text{Time required to flow test liquid}}{\text{Density of water} \times \text{Time required to flow water}} \times 100$$

Density of water × Time required to flow water

- 1) Stability testing of the prepared herbal syrup was performed on keeping the samples at accelerated temperature conditions.
- 2) The final syrup was taken in culture tubes.
- 3) Then kept at accelerated temperature at 4°C, Room temperature and 47°C respectively.
- 4) The samples were tested for all the physicochemical parameters (colour, odour, taste) turbidity and at the interval of 24 hr, 48 hr and 72 hr to observe any change.<sup>[22]</sup>

### 7. Stability testing –

## IV. RESULT DATA DISCUSSION –

SR. NO.	TEST	PERCENTAGE
1	Moisture content	17.6
2	Water extractive value	27.2
3	Ethanol extractive value	41.6
4	Total Ash value	7.5

Table 3. Pre formulation study –



Fig 3 Determination of extractive value



Fig 4 Determination of total Ash value

Sample	Distance travelled by sample	Distance travelled by solvent	Rf value
Ginger powder	3.5	6.3	0.55

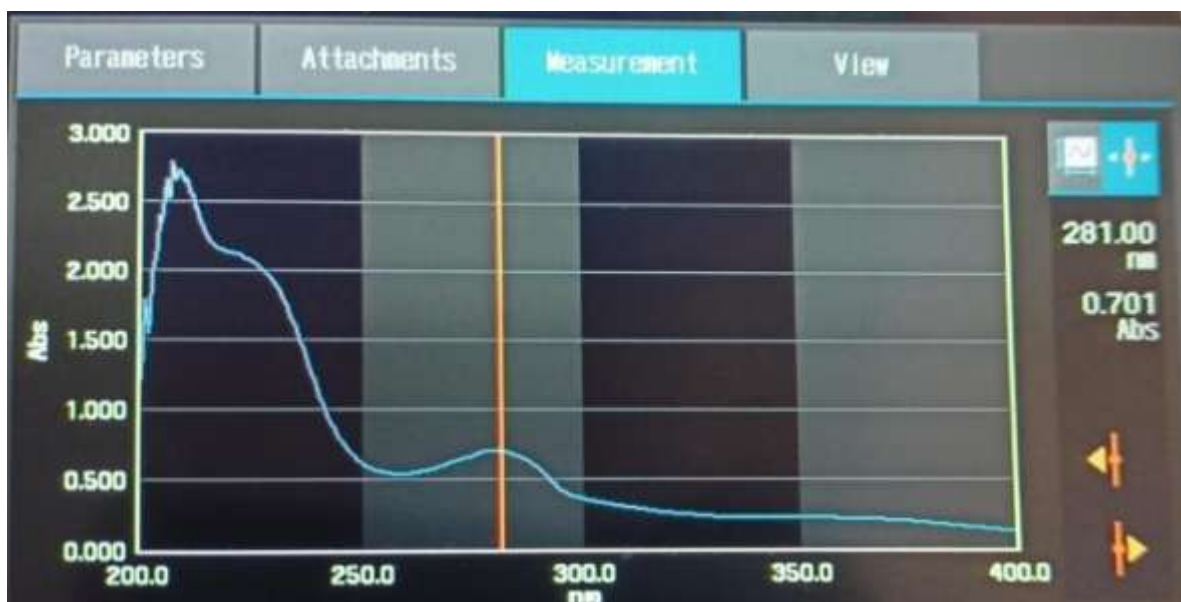
Table 4 Determination of Rf value by TLC –

SR. NO.	SOLVENT	SOLUBILITY
1	Water	Insoluble
2	Ethanol	Soluble
3	Methanol	Soluble

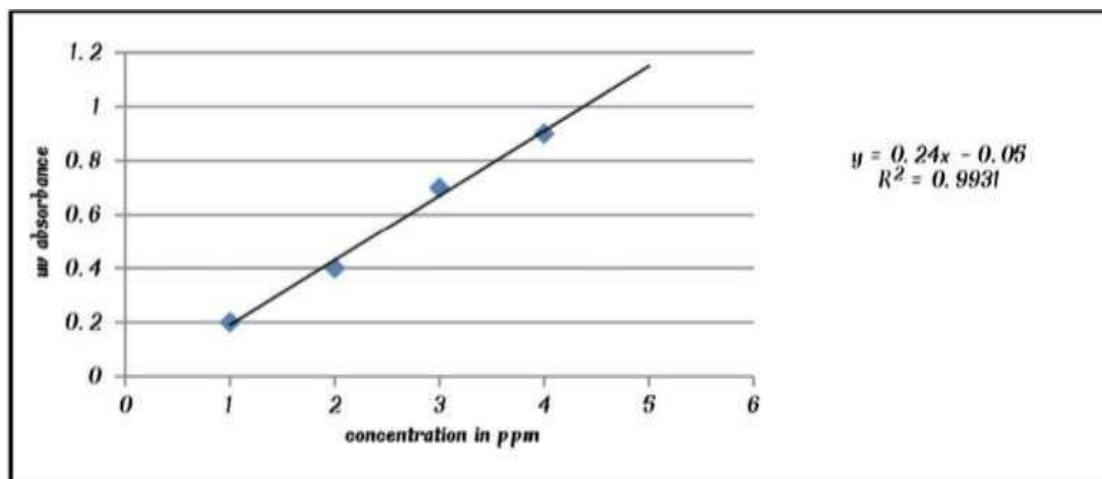
4	Chloroform	Soluble
5	Acetone	Insoluble

**Table 5. Determination of Solubility of ginger –**

UV spectroscopy –



**Fig 5 Value of  $\lambda$  max of ginger was found to be 281.00 from UV spectroscopy.**



**Fig 6 Standard calibration curve of ginger in methanol**

SOLVENT	EQUATION	R <sup>2</sup>
Methanol	Y= 0.24x – 0.05	0.9931

**Table 7 Calibration curve data of ginger extract**



Fig 7 Determination of pH by pH meter Fig 8 Determination of viscosity

TIME DURATION (HOURS)	Temperature(°C)	COLOUR	ODOUR	TASTE	TURBIDITY
24	4 <sup>0</sup> C	No change	No change	No change	No turbidity
	Room temp	No change	No change	No change	No turbidity
	47 <sup>0</sup> C	No change	No change	No change	No turbidity
48	4 <sup>0</sup> C	No change	No change	No change	No turbidity
	Room temp	No change	No change	No change	No turbidity
	47 <sup>0</sup> C	No change	No change	No change	No turbidity
72	4 <sup>0</sup> C	No change	No change	No change	No turbidity
	Room temp	No change	No change	No change	No turbidity
	47 <sup>0</sup> C	No change	No change	No change	No turbidity

Table 8 Stability testing study –

### V. CONCLUSION –

Our overall study is determination of general physical and chemical parameters that are essential for the identification of crude drugs on the basis of available standard data. The physicochemical property of herbal cough syrup finished product were: pH (5.454), Viscosity

(0.03), The Colour (brownish), Odour (aromatic), and taste (sweet) of herbal cough syrup was Satisfactory in physical appearance.

The herbal product is in high demand because of the least possibilities of side effect. The present studies help to develop a herbal cough syrup with

40% w/v Jaggery base Syrup, which is effective and safe.

### VI. ACKNOWLEDGEMENT –

I would like to express my special thanks to Sir Mr. P. B. More as well as our principal sir Dr. A.S. Kulkarni who gave me the golden opportunity to do this project on the topic of Formulation and evaluation of herbal cough syrup of ginger by base Jaggery. Which also helped me in doing a research and I came to know about so many new things I am really thankful to them.

Secondly I would like to thanks my parents and friends who helped me a lot of finalizingthis project

within the limited time frame.

#### REFERENCE –

1. Dr. DD Gaikwad, Sachin K Shinde, Ashwini V Kawade, Dr. SJ Jadhav, Dr. MV Gadhave.. "Isolation and standardization of gingerol from ginger rhizomes by using TLC, HPLC and identification test." The pharma innovation journal 2017; 6(2):179-182.
2. Tanuja Nesari, B. K. Bhagwat, Jasmin Johnson, Narendra S. Bhatt, and Deepa Chitre, "Clinical Validation of Efficacy and Safety of Herbal Cough Formula: Study of Herbal Cough Syrup", Journal of Herbal Pharmacotherapy, 1-12
3. Ankush Ganpat Patil, Kaivalya Gajanan Mirajakar, Laxman Savekar, Chetana V. Bugadikattikar, Somesh S. hintre. "Formulation and evaluation of ginger macerated honey base herbal cough syrup". International Journal of Innovation science and research technology ISSN No- 2456-2165.
4. <https://www.omicsonline.org/conferences-list/benefits-of-herbal-medicine>
5. S Satam, R Jain, J Dagaonkar, C Chotalia, A Suthar, and R Joshi, "Evaluation of Clinical Efficacy and Tolerance of Khasceeze –SF Cough Syrup", International Journal of Pharmaceutical Sciences and Drug Research, 2011; 3(1): 67-68
6. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6616534/>
7. <https://www.google.com/search?q=physical+and+chemical+properties+of+tulsi>
8. Foeniculum vulgare: A comprehensive review of its traditional use, phytochemistry, pharmacology, and safety
9. [https://www.rxlist.com/black\\_pepper/supplements.htm#:~:text=Black%20pepper%20contains%20a%20chemical,it%20is%20not%20clear%20how.](https://www.rxlist.com/black_pepper/supplements.htm#:~:text=Black%20pepper%20contains%20a%20chemical,it%20is%20not%20clear%20how.)
10. <https://en.m.wikipedia.org/wiki/Cardamom>
11. [https://www-bebeautiful.in.cdn.ampproject.org/v/s/www.bebeautiful.in/all-things-skin/everyday/benefits-and-uses-of-mulethi-powder?amp\\_js\\_v=a6&amp\\_gsa=1&amp;usqp=mq331AQKKAFQArABIIACA%3D%3D#aoh=16546094206597&referrer=https%3A%2F%2Fwww.google.com&amp\\_tf=From%20%251%24s&ampshare=https%3A%2F%2Fwww.bebeautiful.in%2Ffall-things-skin%2Feveryday%2Fbenefits-and-uses-of-mulethi-powder](https://www-bebeautiful.in.cdn.ampproject.org/v/s/www.bebeautiful.in/all-things-skin/everyday/benefits-and-uses-of-mulethi-powder?amp_js_v=a6&amp_gsa=1&amp;usqp=mq331AQKKAFQArABIIACA%3D%3D#aoh=16546094206597&referrer=https%3A%2F%2Fwww.google.com&amp_tf=From%20%251%24s&ampshare=https%3A%2F%2Fwww.bebeautiful.in%2Ffall-things-skin%2Feveryday%2Fbenefits-and-uses-of-mulethi-powder)
12. <https://www.webmd.com/vitamins/ai/ingredientmono-705/peppermint>
13. Rajesh CK, Shajahan MA, Shahul Hameed A. Ayurvedic review on Guda (Jaggery). Ayurpharm Int J AyurAlli Sci. 2016;5(5):68-76.
14. <https://pubchem.ncbi.nlm.nih.gov/compound/Methylparaben#section=2D-Structure>
15. [https://www.rxlist.com/consumer\\_peppermint\\_oil/drugs-condition.htm](https://www.rxlist.com/consumer_peppermint_oil/drugs-condition.htm)
16. <https://www.pharmaguideline.com/2011/08/determination-of-ethanol-soluble.html?m=1>
17. <https://labmonk.com/determination-of-water-soluble-extractive-value-of-ginger>
18. Dr. Varsha patil, Dr. Shamim Ahmad. A practical book of pharmacognosy and phytochemistry.
19. Anu Kaushik, "Formulation and evaluation of herbal cough syrup". European journal of pharmaceutical and medical research 2016, 3(5), 517-522.
20. [https://nitsri.ac.in/Department/Civil%20Engineering/CWE-301\\_WATER\\_QUALITY\\_AND\\_ENVIRONMENT\\_pH\\_Meters.pdf](https://nitsri.ac.in/Department/Civil%20Engineering/CWE-301_WATER_QUALITY_AND_ENVIRONMENT_pH_Meters.pdf)
21. Dr. Javesh k. Patil, Dipali R. Mali, Komal R. More, Shraddha M. Jain. "Formulation and evaluation of herbal syrup". World journal of pharmaceutical research volume 8,1061-1067.
22. Vikash Sharma, saurabh singh, Arushi Dixit and Alka Saxena. "Formulation and evaluation of herbal cough syrup from seeds extract of hedge Mustard", International Journal of research pharmacy and chemistry ISSN:2231-278