

## FORMULATION AND EVALUATION OF HERBAL COUGH SYRUP

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### ABSTRACT

*For thousands of years, the most common illness that humans have experienced in the whole planet is a cough. Coughing is the body's protective mechanism. Numerous factors, such as kind, character, length, signs, and symptoms, are taken into consideration when further classifying coughs. The most popular, produced, and extensively used dosage form for cold and cough remedies is syrup. Because herbal syrup offers benefits over synthetic syrups, it is the most recommended dose form for treating coughs. Asian nations are the main users of medicinal plants as primary healthcare agents. Substances having an expectorant antitussive effect are used. This article provides a quick overview of coughs and their homeopathic cures. This study focuses on liquid herbal cough syrup since it is easier to give than solid dosage forms and acts faster to cure coughs. The topic of cough syrup production was discussed. A list of the supplies and quantities used for the preparation was present. In this case, three batches containing honey at concentrations of 35%, 40%, and 45% w/v were made. Post-formulation study was conducted after the quality of the finished syrup was evaluated.*

**Keywords:** *Herbal medicine, expectorant, cough syrup, herbal medicine, cough suppressant, polyherbal preparation and herbal cough syrup.*

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## INTRODUCTION

The involuntary or voluntary process of clearing the throat and breathing route of foreign particles, bacteria, irritants, fluids, and mucus is simply coughing. Another word for coughing is "tussis." It is the quick release of air from the lungs. The brain perceives obstruction or irritation in the throat or upper airway as the presence of an external substance, prompting the body to cough in order to eliminate the foreign object. The three stages of the cough response include inhalation, forced exhalation against a closed glottis, and a forceful lung release that occurs when the glottis opens and is accompanied by a characteristic sound. It is a symptom associated with the majority of respiratory conditions, including pulmonary emboli, lung cancer, viral infections, and asthma. Coughing repeatedly causes discomfort and irritation, which makes a person cough more frequently. Children typically get respiratory tract infections; some of these infections resolve on their own, and there may be very little chance complications.<sup>[1]</sup> Although most of the cases affected patients of all ages, this study revealed that the polyherbal product called expectorant was highly effective and effective in treating cough and chronic cough despite the fact that these chemicals are dangerous and harmful to humans. To get the best results in treating chronic cough that lasts for months or years (sometimes), use "Very Herbal Cough Syrup" made from many good herbs or herbs like menthol. (then cooled), black pepper, cinnamon, cloves and tulsi.<sup>[2]</sup>

The mix of medications in this syrup works wonders for treating coughs, but it may also be used to treat nasal issues or common cold-related respiratory diseases. For thousands of years, nature has provided therapeutic agents. An astounding number of contemporary medications have been derived from natural sources, mostly plants, and many of these have been chosen for their traditional medical use.<sup>[3]</sup>

### **Varieties of coughing**

Cold is categorized based on its type, personality, and frequency.

#### **Based on the kind**

There are two forms of cough: dry breath and watery cough, depending on the type. Indications and indicators are used to identify this.

#### **A dry throat**

A healthy and powerful tone.

Symptoms of a cough with dryness.

Painful throat.

Mucus-free discharged.

Prevalent, short-lived, cough that is dry.

A continuous or persistent tickling.

Medication: antitussive and coughing reducer.

#### **The wet coughing**

Infectious and non-productive chest.

Wet symptoms of coughing.

Has a coughing fit.

Exhaling sharply.

Being tight in the upper body.

Breath difficulties.

Anticipatory medication.

**Based on how long it lasts:**

Coughs can be categorized as acute, sub-acute, or chronic based on how long they last.

**Acute cough**

Coughs that last fewer than three weeks fall into this category.

The common cold, URTIs, COPD, pollutants from the environment, and viral cough are the causes of acute cough.

**Subacute cough**

This form of cough is defined as one that lasts for at least three to eight weeks.

Pertussis infection and pneumonia are the respiratory causes.

Occasionally, Tourette's disorder and Reflux are non-respiratory reasons.

**Persistent cough**

A cough that lasts for a month or more is considered chronic.

Asthma, lung disease, breathing disorders such as COPD, asthma, and TB are the breath causes.<sup>[4]</sup>

**Herbal treatment for cough**

Herbal remedies are the most popular means of treating coughs. Herbal remedies are significantly contributing to the advancement of the medical field. Herbal remedies are employed for moderate to severe medical conditions, such as viral infections, renal ailments, lung cancer, allergies, asthma, TB, cough, pneumonia, and diabetes.

As previously said, according to WHO estimates, 80% of the population even uses herbal medications for basic medical needs. Traditionally, medicinal plants have been employed as basic healthcare agents, particularly in Asian nations [10]. Herbal medications are mostly used to treat chronic illnesses rather than life-threatening ones and to promote wellness.

Many adverse effects, including nausea, vomiting, sedation, allergies, respiratory tract infections, changes in appetite, irritability, sleepiness, addiction, and organ or portion of organ damage, are caused by the majority of synthetic medication treatments. Recent years have seen a major focus by researchers on herbal medications and therapies that have little or nonexistent adverse effects both during and after therapy.<sup>[5]</sup>

Sr No.	Name of drug	Biological name	Family
1	Clove	<i>Eugenia aromatica</i>	Myrtaceae
2	Cinnamon	<i>Cinnamomum cassia</i>	Lauraceae
3	Black pepper	<i>Piper nigrum</i>	Piperaceae
4	Tulsi	<i>Ocimum sanctum</i>	Lamiaceae
5	peppermint	Menthol/ mentha	Mint
6	Honey	-----	-----

**Table No.1: List of Substances Used, Along with Biological Name and Family**

**MATERIALS/METHODOLOGY****Clove**

The clove (*Syzygium aromaticum*) blossom, ripped and dried, was employed. These are readily available in the market already dried, but they must be dried in the sun for four to five hours. Then, for formulation purposes, about 20 to 30 g of dried clove were collected.

### Cinnamon

Cinnamomum cassia bark that had been ripped and dried was utilized. These are also readily available in the market in dried form; nevertheless, to remove all moisture, they must also be sun-dried. After then, 20 to 30g of cinnamon were included in the recipe.<sup>[6]</sup>

### Black paper

We utilized the dried, torn fruit from the black paper (*Piper nigrum*). These are little, cleansed, cleared beans with a black color. These are sold in stores with other medications. It took close to 1015 grams of the substance to formulate it.

### Tulsi

Tulsi leaves that had just been harvested were utilized; for formulation, about 20–25 grams of fresh leaves should be taken.<sup>[7]</sup>

### Peppermint

Menthol crystals, which are widely accessible, were simply ground into a powder and between 0.2 and 0.5 grams were collected for formulation.

### Honey

Any brand-name honey that is commercially available can be utilized; for example, the 250 ml commercially available Dabur honey preparation was used; the honey was already stabilized and refined; about 40–50 ml were used for the formulation.<sup>[8]</sup>

Sr No.	Drugs	Formulation (F1) (per 100ml)	Formulation (F1) (per 100ml)
1	Clove	20ml (decoction)	15ml (decoction)
2	Cinnamon	20ml (decoction)	15ml (decoction)
3	Tulsi	20ml (decoction)	15ml (decoction)
4	Black paper	15ml (decoction)	10ml (decoction)
5	Honey	25ml (marketed)	50ml (marketed)
6	Menthol	0.3g (Crystals)	0.3g (Crystals)
7	Propyl paraben	-	0.2mg

**Table No.2: Formulation of F1 &F2 formulation**

## EXPERIMENTAL WORK

### Method of Preparation

A decoction methodology was used to make the herbal syrup for coughing.

The steps involved in making herbal cough syrup are listed below.

The syrup creation technique Making medicine powder

Using a grinder and mortar, the necessary quantity of each dried crude drug (clove, cinnamon, and black paper), weighing approximately 20–40g, was taken and ground into a fine powder. Each drug was then separated into separate vessels and weighed, ensuring that each drug satisfies the quantity needed. Black paper should weigh around 1015g, while cloves and cinnamon should weigh about 20–40g.<sup>[9]</sup>

### Extract via maceration

Every medication was administered in powder form for the maceration procedure. The drugs are separated and placed in separate beakers with 400–500 milliliters of distilled water or water that has been slightly diluted with alcohol (2-4 milliliters of alcohol in 100 milliliters of water). After adding the appropriate amount of water (about 13–14 times the amount of medication), the glass containers were left alone for over 17–24 hours.<sup>[10]</sup>

### **Making the infusion of Tulsi leaves**

First, roughly 30–40g of fresh green Tulsi depart ought to be taken, disinfected and washed. They must then be added to a beaker and soaked in 400–500ml of distilled water (approximately three–four times the amount of drug). The soaking vessel should be left undisturbed for approximately 4–5 hours, and after that time, the solution should be heated until only a small amount remains, or about one third, remains of its original volume, which was originally 20–25 ml. After that, it was removed, filtered through muslin fabric, and carefully kept.<sup>[11]</sup>

### **Decoction of some of mashed medicinal product**

The previously marinated powdered medications were gathered and simultaneously cooked for about one and a half hours at a steady temperature, until less than a little portion—roughly 10 to 20 milliliters—of water remained. The resulting infusion was next passed through muslin fabric and kept apart.<sup>[12]</sup>

### **Making the finished poly flower syrup**

Since honey is a syrup in and of itself and is a component of drugs, around 50 milliliters of it was taken in a 100 milliliter beaker. The honey was then set aside. Next, a well-mixed decoction of all drug elements was created, with 15 milliliters of cloves, 15 milliliters of cinnamon, 15 milliliters of Tulsi, and 10 milliliters of black paper. Additionally, 0.3 grams of menthol were added during mixing. After adding the produced mixture from the glassware with the honey, the mixture was agitated to create a single phase and then allowed to settle for stabilization. Finally, using water, the ultimate volume of syrup was produced to be 100ml.<sup>[13]</sup>

### **EVALUTION TEST FOR THE POLY HERBAL SYRUP**

Evaluation tests for polyherbal syrup are crucial to ensure the formulation's safety, efficacy, and quality. Below are the key evaluation tests:

#### **Organoleptic Evaluation**

**Appearance:** Visual inspection to ensure consistency in color, clarity, and absence of particulate matter.

**Odor:** Check for a characteristic smell that is not offensive.

**Taste:** Ensure the taste is acceptable and palatable.<sup>[14]</sup>

#### **Physicochemical Tests**

##### **pH Measurement**

###### **Procedure**

Measure the pH using a calibrated pH meter.

###### **Acceptable Range**

Typically, between 4.5 and 7.5.<sup>[15]</sup>

##### **Viscosity**

###### **Procedure**

Use a viscometer to measure the syrup's thickness.

###### **Acceptable Range**

Depends on the syrup's formulation, generally ensuring it's not too thick or too runny.

##### **Density**

###### **Procedure**

Measure the density using a pycnometer or a hydrometer.

###### **Acceptable Range**

Ensures consistency between batches.<sup>[16]</sup>

## RESULTS

### The syrup's physiological properties

Sr No.	Physiochemical parameters	Observed values (F2)	Observed values (F1)
1	Colour	Dark Greenish	Dark Greenish
2	Odour	Aromatic	Aromatic
3	Taste	Sweet aromatic	Sweet aromatic
4	pH	6.98pH	6.51pH
5	Density	1.43g/ml	1.20g/ml

**Table No. 3: Physiochemical parameters**

## DISCUSSION

The physiological chemical features of the syrup, including its color, flavor, pH, density, specific gravity, and viscosity, were measured. The findings of the assessment parameters were presented in Table -3. The produced Poly herbal anti-tussive syrup has an acidic pH, an olive red color, a pleasant flavor, and acceptable pourability.

## CONCLUSION

The current study came to the conclusion that by providing a thorough overview of herbal medications for the treatment of cough, both crude medications and polyherbal formulations are excellent substitutes for contemporary cough medications, which have several negative effects. The present study effectively produced and tested a polyherbal anti-tussive syrup using medicinal herbs such as black paper, tulsi, cinnamon, clove, and honey as a foundation. Additionally, menthol was included as a cooling agent expectorant. The manufactured polyherbal anti-tussive syrup has acceptable physical properties, good accelerated stability research, and antibacterial action, according to the results of the current investigation. This study effectively established that the polyherbal anti-tussive syrup exhibits its maximal efficacy and reduces cough intensity; the syrup's high tolerability profile makes it especially helpful for cough sufferers. Scientific investigations have demonstrated the broad range action of the syrup's individual constituents, which include anti-tussive, expectorant, anti-histaminic, bronchodilator, nasal decongestant, anti-allergic, anti-bacterial, and anti-viral properties. Patients of all ages who have sore throats, hoarse voices, chronic bronchitis, asthmatic bronchitis, or acute upper respiratory tract infections will benefit from taking one to two tablespoons of this poly herbal syrup on a daily basis.

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