



# FORMULATION AND EVALUATION OF HERBAL COUGH SYRUP

**MISS. KHARADE SANDHYA A.<sup>1</sup>, MS. SHELKE A.P.<sup>2</sup>**

<sup>1</sup> FINAL YEAR B. PHARMACY STUDENT LNBCIOP, RAIGAON, SATARA

<sup>2</sup> ASST. PROFESSOR LNBCIOP, RAIGAON, SATARA

## ABSTRACT -

Diseases are one of the most difficult aspects of human life, and they include both chronic and acute illnesses. Coughing is a frequent respiratory symptom that can significantly affect one's quality of life. Coughing is one of the most important prevalent issues that affect everyone. A cough, sometimes referred to as tussis is an involuntary or voluntary act that involves rapidly expelling air from the lungs while clearing the throat and breathing passage of foreign objects, bacteria, irritants, fluids, and mucus. Syrup is common and typically helpful dose type for treating colds and coughs using honey as a base, we prepared the herbal cough syrup using a combination of medicinal plants which act as a natural ingredients such as betel leaf, ginger, turmeric powder, clove, cardamom and tulsi leaves along with methyl paraben. The antitussive and antimicrobial activity of the betel leaf made us to select it for the formulation of herbal cough syrup. Other excipients such as turmeric powder, tulsi leaves, ginger and clove were also used in the formulation as they are found to be effective in treating cough. Honey was used as the base and sweetening agent in the formulation and cardamom as flavoring agent. In this way the herbal cough syrup from betel leaf with two formulas F1 and F2 was prepared and evaluated using evaluation parameters.

**KEYWORDS -** Betel leaves, antitussive, anti-microbial, cough syrup, honey base.

## INTRODUCTION -

India is the birthplace of several traditional alternative medicinal systems. India's medical legacy of Ayurveda is entirely focused on nature, particularly plants. Therefore, the great Ayurvedists like Charaka and Sushruta have extensively discussed how to recognize and use therapeutic herbs. The COVID-19 condition started two years ago, during which time demand for herbal drugs has increased relative to that of synthetic drugs. Any type of coughs can be prevented and treated with herbal cough syrup. It also functions as an immune booster in addition to this. Now a days, many people using herbal remedies.

The prevalence of asthma is increasing daily in India due to a number of environmental and man-made factors. Asthma is a chronic lung disease that affects individuals of all ages. It is caused by inflammation and tightness of the muscles surrounding the airways, which makes it harder to exhale when experiencing symptoms of a cough. Coughing is the term for an inflammation and formation of fluid in the lungs caused by a bacterial, viral, or fungal disease. It might cause fever and difficulty breathing. Your body reacts to inflammation of the throat or airways by producing a cough. Your nerves fire in response to an irritation, sending your brain.

### **Introduction of Herbal cough syrup :**

Herbal cough syrup is a natural treatment used to treat coughs and other respiratory ailments. Most people believe herbal cough syrup to be both safe and effective. Using honey as a base and the decoction of herbal medications, herbal cough syrup was prepared. The decoction process is used to prepare the herbal cough syrup. The additional honey sweetener can also help in making herbal medications more palatable.

### **Benefits of herbal cough syrup:**

- Relieves cough and sore throat
- Treat respiratory problems
- It is also an amazing antifungal, antimicrobial, antidiabetic and antiseptic remedy
- Helps with asthma
- Helps to reduce inflammation in airways

**Types of herbal cough syrup:**

- Simple syrup – When only purified water is used to make a sucrose solution, the product is known as “simple syrup,” Simple syrup comprises only sucrose (sugar) and purified water.
- Example: sucrose – 66.7ml and purified water- 100ml
- Mediated syrup- When syrup contains medicinal substances, it is known as medicated cough syrup.
- Example: cough syrup .
- Flavored syrup- Syrup containing flavoring agent but not medicinal substances are called flavored syrup.
- Example: Cherry and Rasperry syrup

**Background of betel leaf:**

Betel leaf is heart shaped perennial creeper and is found in countries like India, Sri Lanka, Malaysia, Indonesia .

Betel leaf is commonly known as paan in hindi vetrillai in Tamil and thamalapaku in telugu. betel leaves have loads of medicinal benefits. Betel leaf used as antitussive and antibacterial.

- Pharmacological activity of betel leaf:
- Antitussive
- Antimicrobial and antibacterial
- Antidiabetic
- Immunomodulator
- Anti-inflammatory
- Antiseptic

Following herbal parts are used in the formulation of herbal syrup

**1. Betel leaf**

Scientific name-Piper Betel

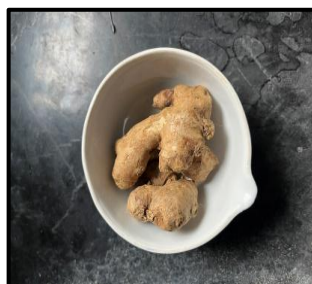
Genus - piper

Family – Piperaceae

Plant profile - Betel leaf is a perennial creeper with a heart-shaped form that grows in tropical and subtropical regions including India , East Africa, Malaysia, Indonesia and Sri Lanka. Betel leaves are also called “paan leaves” in India, where they are consumed by about 15–20 million people . The betel leaf is an evergreen plant .

**Health benefits of betel leaf -**

- Antimicrobial property
- Help with asthma
- Improve oral health
- Good for diabetes
- Reduce cholesterol
- Antitussive and antifungal

**2. Ginger**

Scientific name - *Zingiber officinale*

Genus - *Zingiber*

Family - *Zingiberaceae*

Plant profile - Ginger (*Zingiber officinale* Roscoe) is a bulbous plant that has been grown for a long time. It has been a component of medical practices in Asia, India, Europe to treat ailments such as arthritis, stomach distress, asthma, diabetes, and menstrual irregularities, relief cough.

Biological source – Ginger consist of dried rhizomes of ginger offinale . it's outer skin is removed by scraping after which is dried in the sun .

Health benefits of ginger –

- Promote respiratory health
- Treatment for cough and cold
- Fights inflammation
- Cure fungal and viral infection

### 3. Tulsi



Scientific name – *ocimum sanctum*

Genus – *ocimum*

Family – *Lamiaceae*

Plant profile – Tulsi is referred to as “The Incomparable One,” “Mother Medicine of Nature,” and “The Queen of Herbs” in Ayurveda. Tulsi plant grows to a height of up to one meter (3.3 feet) and is a small annual or short-lived perennial shrub. It typically has a bitter taste, and its roots, leaves, and seeds have a variety of therapeutic benefits.

Biological source – Tulsi consists of the fresh and dried leaves of *Ocimum* species like *Ocimum sanctum* L. and *Ocimum basilicum* L. etc.

Health benefits of tulsi -

- Boosts immune system
- Shows antitussive and antibacterial properties
- Treat respiratory disorders
- Help in dry and productive cough

### 4 . Honey



Family – *Apidae*

Genus – *Apis*

Biological source – Honey is sugar secretion deposited in honeycomb by the bees , *apis mellifera* , *apis dorsata*

-Honey has been utilized for ages for a variety of uses in addition to sweetening. Not only does it have a distinct flavor and aroma, but it also offers various health benefits . Bees make honey, a sweet, thick fluid made from plant nectars, which is often used as a food sweetener . Honey may help reduce coughing, which is a possible health advantage.

Health benefits of honey –

- Good remedy for diabetes
- Boost immune system
- Improve sore throat

### 5 . Clove



Scientific name – *Syzygium aromaticum*

Family – Myrtaceae

Genus – Syzygium

Biological source – It consists of dried flower buds of *Eugenia caryophyllus* .

Plant profile – The antibacterial and anti-inflammatory qualities of clove are well-known, and they may help reduce the symptoms of a dry cough. The scent of cloves is strong, warm, sweet, spicy, and slightly astringent. They are rich brown in colour.

**Health benefits of clove –**

- Antidiabetic and anti-inflammatory
- Treat cough and cold
- Boost immune system
- Maintain respiratory health

#### 6. Turmeric powder



Scientific name – *Curcuma longa* , *Curcuma Aromatica*

Genus – *Curcuma*

Family – Zingiberaceae

Biological source –Turmeric is the dried as well as rhizome of plant known as *curcuma longa* Linn.

Plant profile – Turmeric is a widely used spice derived from the *Curcuma longa* root. It contains a substance known as curcumin, which may reduce swelling. Turmeric has a warm, bitter flavour.

**Health benefits of turmeric –**

- Fights against cough and cold
- Help menstrual discomfort
- Help to reduce inflammation and respiratory problems
- Improve digestion

#### 7. Cardamom



**Scientific name** - *Elettaria cardamomum*

**Family** - Zingiberaceae

**Biological source** - Cardamom, spice consisting of whole or ground dried fruits, or seeds of *Elettaria cardamomum* .

**Plant profile** – India and the Middle East make heavy use of cardamom, a sweet, aromatic spice with an unusual scent. Cardamom includes compounds that may fight against bacteria, reduce edema, and boost the immune system.

**Health benefits of cardamom –**

- Good remedy for nausea and vomiting.
- Improve blood circulation.
- Provide relief from sore throat .

**Method of preparation**

- A. Extraction of betel leaves :

Betel leaves were collected and washed with sterile water. The betel leaves were triturated in mortar pestle and 60 gm of betel leaves were placed in a reflux condenser with 100 ml of water for 2 hours. After cooling filter the solution using filter paper.



#### B. Extraction of tulsi, clove , turmeric, ginger and cardamom:

- To make the extracts, all the ingredients were boiled in 100 ml water for one hour.
- Then all the extracts were cooled and filtered and the filtrate was taken for the formulation of herbal cough syrup

Extraction of all ingredients:



#### Method of preparation for final herbal syrup:

- To produce the final herbal syrup, mix 20 ml of betel leaf decoction, 3 ml of ginger, 3 ml of clove, 3 ml of turmeric, 3 ml of tulsi, and 3 ml of cardamom decoction with 15 ml of honey . Mix gently and continuously stir side by side.
- When the syrup is ready, pour it into an amber colour bottle, label it neatly, and store it somewhere cool.
- The final herbal syrup was made and then submitted for evaluation .



#### FORMULATION TABLE – For 50ml

##### For Bottle A –

SR NO.	INGREDIENTS	QUANTITY	ROLE
1	Betel leaves	20ml	API
2	Tulsi	3ml	Antibacterial
3	Clove	3ml	Antimicrobial
4	Turmeric	2ml	Anti-inflammatory
5	Ginger	3ml	Anti-oxidant
6	Cardamom	2ml (Q.S)	Flavoring agent
7	Methyl paraben	2ml	Preservative
8	Honey	15ml	Base

##### For Bottle B –

SR NO.	INGREDIENTS	QUANTITY	ROLE
1	Betel leaves	15ml	API

2	Tulsi	7ml	Antibacterial
3	Clove	3ml	Antimicrobial
4	Turmeric	3ml	Anti-inflammatory
5	Ginger	5ml	Anti-oxidant
6	Cardamom	5ml(Q.S)	Flavoring agent
7	Methyl paraben	2ml	Preservative
8	Honey	10ml	Base

### EVALUATION TEST -

#### 1. Colour examination –

- Take 2 ml of the prepared syrup on watch glass and smelled it .
- Colour was observed by naked eye .

#### 2. Odour examination –

- 2 ml of prepared syrup was taken and smelled .
- Then odour was observed .

#### 3. Taste examination –

- A small amount of the finished syrup was taken and tasted on the tongue's taste buds .

#### 4. PH determination -

- Placed an accurately measured 10 ml of prepared syrup in a 100 ml volumetric flask and filled to 100 ml with distilled water.
- The solution was sonicated for approximately 10 minutes. PH was measured with a digital pH meter.

#### 5. Viscosity determination –

- To properly clean the Ostwald viscometer, use acetone or another suitable organic solvent.
- Place the viscometer on a suitable stand in an upright position.
- Filled the viscometer with water up to the G mark .
- The time it took for water to flow from point A to B was timed in second .
- To obtain an accurate reading , this process was performed at least 3 times.
- After washing the viscometer with a sample liquid and filling it to mark A , record how long it takes the liquid to reach mark .

#### Formula of viscosity:

Density of test liquid x Time required to flow test liquid viscosity = X Viscosity of water Density of water x Time required to flow water.

### Result -

Sr.no	Evaluation parameter	Formulation A	Formulation B
1	Colour	Brownish	Brownish
2	Odour	Aromatic	Aromatic
3	Taste	Sweet	Sweet
4	PH	6	6.3
5	Viscosity	1.10cp	1.03 cp

### Conclusion

The present research study “formulation and evaluation of herbal cough syrup (betel leaves)” revealed a specific conclusion. The herbal syrup used as an antitussive made on a lab scale. It can be administered as a liquid dosage form. Herbal syrup including natural herbs such as betel leaves, tulsi, clove, honey , turmeric, ginger , cardamom which have varied actions and effects on treating acute or chronic cough and cold and acting as a cough suppressant with expectorant and antitussive properties.

The current study contributes to the development of a herbal cough syrup that is both safe and effective, with 40% honey used as a base . In this research, we conclude that herbal cough syrup is a safe herbal medicine used to treat coughs and cold .

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