SJIF Impact Factor (2025): 8.688| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 10 | Issue: 6 | June 2025 - Peer Reviewed Journal

FORMULATION AND EVALUATION OF HERBAL COUGH SYRUP

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ABSTRACT

One of the most general problems among adults and children are cold, flu and their symptoms such as coughs and sore throaty. In such instances, we find that most people turn to certain medications for temporary relax that sometimes do not meet the prescribed health and safekeeping guidelines. The treatment of these acute infections and their underlying symptoms is one area where the use of certain herbal remedies are still remains common today. Herbal drugs play an important role in the management of it.(1) Currently available therapies for cough include cough suppressants which gives temporary fast relief but no longer has effective without any side effect but herbal expectorant and antitussives given better longer relief with minimal side effect. Many plants category known in people medicine of different civilization used for treatment of respiratory complaints such as cough, pneumonia and expectoration as well as in common cold also. Nowadays many pharmaceutical companies investing for research of improved efficacy of herbal medicines while considering the increasing interest of most of the population of world towards the Ayurveda formulations.(2)

KEYWORDS: *Cough, Antitussive, Expectorant, Herbal medicine, Herbal formulations.*

INTRODUCTION

Tulsi leaves are used to treat skin problems like acne, blackheads and premature ageing. Tulsi is used to treat insect bites. Tulsi is also used to treat heart disease and fever. Tulsi is also used to treat respiratory problems. Tulsi is used to cure fever, common cold and sore throat, headaches and kidney stones. Tulsi is rich in Vitamin C and zinc. It thus acts as a natural immunity booster and keeps infections at bay. It has immense anti-bacterial, anti-viral and anti-fungal properties which protect us from a variety of infections. Herb is a plant that is valued for flavour, scent, medicinal or other qualities. Herbs are used in cooking, as medicines, and for spiritual purposes. Herbs have a variety of uses including culinary, medicinal, or in some cases even spiritual usage. General usage differs between culinary herbs and medicinal herbs. Among the plants known for medicinal value, the plants of genus Ocimum belonging to family Labiatae are very important for their therapeutic potentials Ocimum sanctum L. Ocimum sanctum L. known as 'Tulsi' in Hindi and 'Holy Basil' in English, is an erect softy hairy aromatic herb or under shrub found throughout India. Tulsi is commonly cultivated in gardens. Tulsi is used as expectorant and diaphoretic. Boch root is also used as an expectorant. Pudinasar stops irritation of the throat. Madhu acts as a demulcent and gives soothing effects to the irritated throat. (5)

OBJECTIVES

- Various herbal sources are used in treatment of common cold or cough like sore throats, coughs, cold, and bronchitis.
- These acute infections can be treated by using some common herbal medicine, as the continuous use of chemicals may harm our body as well as produces resistance which leads to ineffective treatment in chronic infections.
- The literature survey gives better idea on applications of herbal plants in treatment of common colds is an attempt to collect the information regarding herbal medicines used in the treatment of these cough for benefit of society.
- Along with herbal treatment the science behind its mode of action in particular disease or disorder is discussed. (4)
- From the literature we can promote the use of herbal formulations for acute infection like cough and common cold which give better and longer effect without or minimal side effects and also avoid habit formation.
- Provide Natural Relief from Cough and Throat Irritation Formulated with herbal ingredients known for their demulcent, anti-inflammatory, and expectorant properties, the syrup aims to soothe the throat and suppress dry or productive cough naturally.

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- Support Respiratory Health Holistically Enhance respiratory function and reduce congestion through herbs that help clear mucus, open airways, and support immune system function.
- Minimize Side Effects Compared to Synthetic Alternatives Offer a safer alternative to conventional cough medicines that may cause drowsiness, dependency, or gastrointestinal discomfort, especially suitable for children and elderly patients.
- Utilize Time-Tested Herbal Remedies Combine ingredients with a history of use in traditional medicine systems (like Ayurveda, Unani, or Traditional Chinese Medicine) supported by modern research.
- Cater to Increasing Consumer Demand for Natural Products Meet the growing preference for plant-based and chemical-free health solutions among health-conscious consumers.
- Provide a Palatable and Easy-to-Use Dosage Form Ensure the syrup is pleasant in taste and convenient to administer for individuals of all ages.
- Contribute to Preventive Healthcare Strengthen immunity and prevent recurrence of respiratory infections through herbs with immuno modulatory effects.
- Ensure Safety and Standardization Maintain product quality and consistency through the use of standardized herbal extracts and compliance with safety regulations.

REVIEW OF LITERATURE

SR.NO	TITLE	AUTHOR	WORKDONE
1)	A review of precious species of clove with multiple use (Cortés-Rojas et al., 2014)(Cortés-Rojas et al., 2014)	Diego Francisco Cortés-Rojas	This work is a review documenting the main studies reporting the biological activities of clove (*S. aromaticum*) and eugenol.
2)	Ginger on Human Health: A Comprehensive Systematic Review of 109 Randomized Controlled Trials	Nguyen hoang Anhg, Sun Jo kim	Ginger (*Zingiber officinale* Roscoe), a well-known herbaceous plant, has been widely used as a flavouring agent and herbal medicine for centuries. Furthermore, the consumption of the ginger rhizome is a typical traditional remedy to relieve common health problems, including pain, nausea, and vomiting
3)	A review paper on a Tulsi plant (ocimum sanctum L) 2020	Lopamudra Sethi	We directed a complete writing audit of human examinations that gave an account of a clinical result after ingestion of Tulsi. All investigations detailed ideal clinical results without any examinations revealing.
4)	Honey and Health: A Review of Recent Clinical Research	Saeed Samarghandian, Tahereh Farkhondeh, and Fariborz Samini	Studies revealed that the medicinal effect of honey may be due to of its antibacterial, anti-inflammatory, apoptotic, and antioxidant properties.
5)	A review of Tulsi plant & their chemical constituents 2012	D.J Garkalet.al (2012)	An aggregate of 24 examinations were distinguished that announced restorative consequences for metabolic disarranges, cardiovascular malady, resistance, and neurocognition. All investigations detailed ideal clinical results without any examinations revealing any noteworthy antagonistic occasions. The explored examinations strengthen customary uses and propose Tulsi. Herbs are well known as they are used for the same purpose.
6)	Garlic: a review of potential therapeutic effects	Leyla Bayan,1 Peir Hossain Koulivand,1 and Ali Gorji1,2*	Recently, studies were carried out to known its effect on the cancer cell lines. Many studies have shown its effects not only on carcinomas, but also on the cardiovascular system and immune system [6]

MATERIAL AND METHOD

Sr.no	Materials	Categories
1	Tulsi	Anti-bacterial and antifungal
2	Ginger	Antioxidants
3	Honey	Antibacterial, Antimicrobial
4	Clove	Anti-inflammatory
5	Vasaka	Anti asthmetic
6	Fennel	Carminative

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GLASSWARES
1. Beaker
2. Measuring Cylinder
3. Buchner funnel
4. Round bottom flask
5. Dropper
6. Filter paper
7. Glass rod
8. Burette stand
9. Condenser
10. Soxhlet Apparatus

INSTRUMENTS
1. Weighing Balance
2. Heating mantle

Details information about Tulsi
Biological Name: Holy Basil
Biological source: The fresh and dried leaves of the ocimum sanctum linn.
Family: Lamiacae
Kingdom: Plantae
Chemical constituents: Eugenol, carvacrol, linalool and flavonoids.
Uses: Anti- tussive



Details information about Ginger
Scientific Name: Zingiber Officinale
Biological source: It consist of rhizomes of Zingiber officinale and dried in the sun.
Family: Zingibareceae

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Kingdom: Plantae
Chemical constituents: phenolic and terrine compounds
Uses: It helps to symptoms of cold and sore throat.



Details information about Clove
Scientific Name: Syzygium Aromaticum
Biological source: Dried flower buds of Syzygium aromaticum.
Family: Myrtaceae
Kingdom: Plantae
Chemical constituents: acetyl eugenol, alpha and beta caryophyllene.
Uses: It is used to treat sore throat, and cough.



Details information about Vasaka
Scientific Name: Justicia adhatoda
Biological source: It is dried and fresh leaves of Adhatoda vasica or Malabar nut.
Family: Acanthaceae
Kingdom: Plantea
Chemical constituents: alkaloids like vasicine and vasicinone, which are quinazoline alkaloids.
Uses: the common cold, cough and flu symptoms



Details information about Fennel
Scientific Name: Foeniculum vulgare
Biological source: It is the dried, ripe fruits of the plant Foeniculum vulgare Miller
Family: Apiaceae
Kingdom: Plantae
Chemical constituents: anethole, fenchone, and estragole

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Uses: used to improve digestion, reduce bloating, and freshen breath.



Details information about Honey
Common Name: Honey bee
Scientific Name: Arthropoda
Biological source: Honey is produced by both honey bees and stingless bees.
Family: Apidae
Kingdom: Animalia
Chemical constituents: glucose, fructose, and Maltese
Uses: Reduce night time coughing and improve sleep.



Mechanism of Action

Stimulation of mhecano chemoreceptor

↓

Afferent impulses of cough center (medulla)

↓

Efferent impulses of via parasympathetic and motor nerves lunges

↓

Increased contraction of diagrammatical abdominal and cough

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Types of Cough

1) Productive Cough

Which is mostly acute in nature and often caused by bacterial or viral or fungal infection.it is also called as an effective cough and wet cough, since its impressive ejection secretions, mucous or alien material from the respiratory tract. This cough not be suppressed, treatment is followed to eliminate mucus. Productive cough is unhealthy in post operative patients, e.g., after eye surgery (Karlsson, J.A.1996). [10]

2) Non-Productive

Cough as name indicates it won't bring any secretions or mucous from the lungs. It is a dry, irritating cough without mucus. , this type of cough is acrid in nature and caused by dry aggravation or dust or smoke or smoke , or due to swelling and mild secretion in the resolving stage of illness it is most common symptom in asthma It may be also due to weakness of the muscles of respiration, thick sticky mucus and in diseases of the eye-lash which helps mucous transportation in the airway. (Bennett and Brown, 2003 [11]

3) By Duration

1. **Acute Cough**
   Lasts less than 3 weeks Common causes: Common cold, flu, pneumonia, bronchitis
2. **Subacute Cough**
   Lasts 3–8 weeks Often follows a respiratory infection
3. **Chronic Cough**
   Lasts more than 8 weeks Common causes: Asthma, GERD, chronic bronchitis, postnasal drip

4) By Characteristics

1. **Whooping Cough (Pertussis)**
   Severe coughing fits followed by a "whooping" sound on inhalation
   Caused by Bordetella pertussis bacteria
2. **Barking Cough**
   Harsh, hoarse-sounding Common in children with croup
3. **Choking or Gagging Cough**
   Sudden and reflexive, often from food, liquids, or foreign bodies entering the airway

5) By Underlying Cause

1. **Allergic Cough**
   Triggered by allergens (pollen, dust, etc.)
   Often dry, with other allergy symptoms
2. **Asthmatic Cough**
   Can be dry or productive Often worse at night or after exercise
3. **GERD-related Cough**
   Triggered by acid reflux irritating the throat
4. **Postnasal Drip Cough**
   Mucus from the nose drips into the throat, triggering a cough Often worse at night
5. **Medication-Induced Cough**
   Common with ACE inhibitors (e.g., lisinopril)

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Procedure

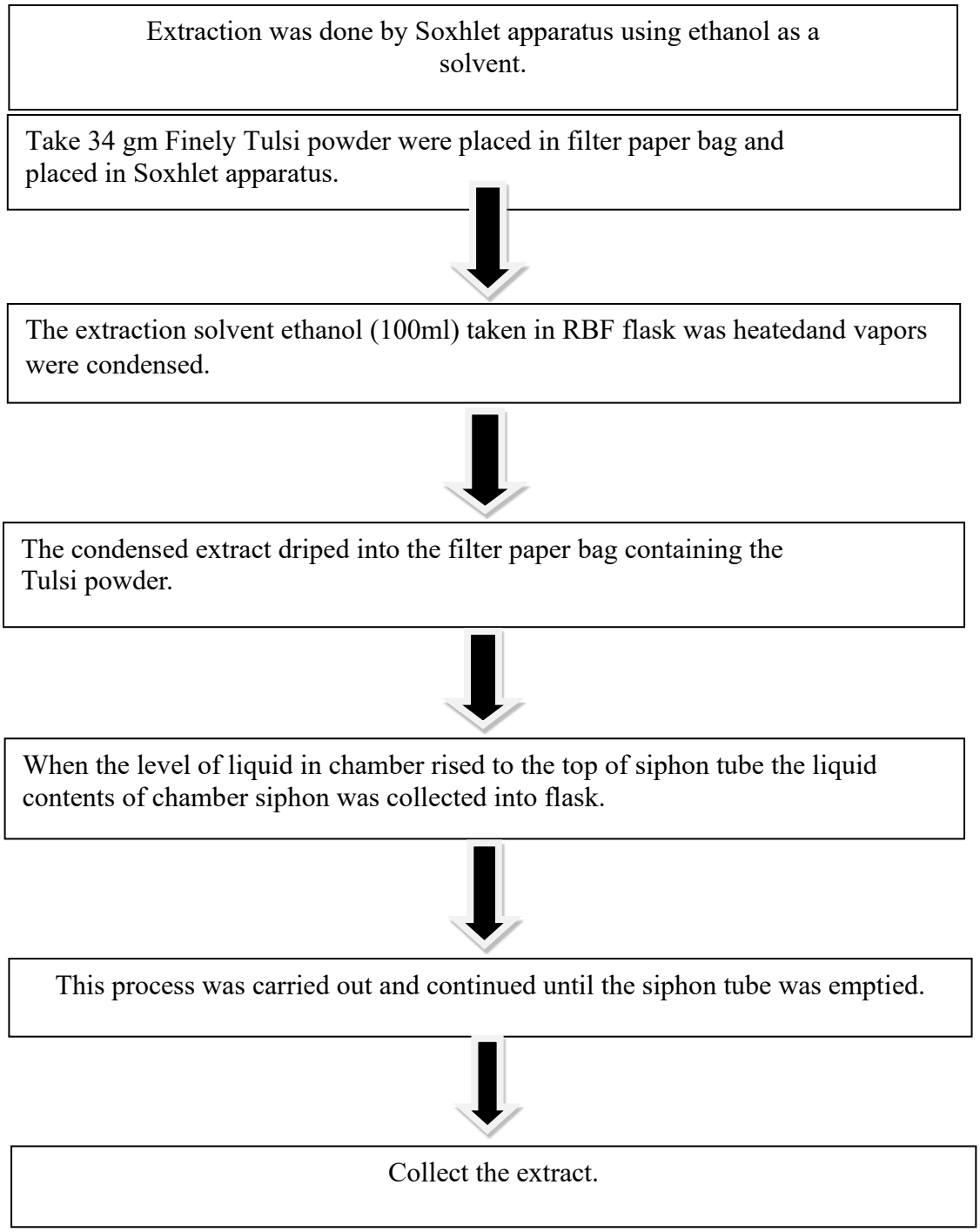


Fig- Extraction Process[12]

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Fig.: Soxhlet Apparatus

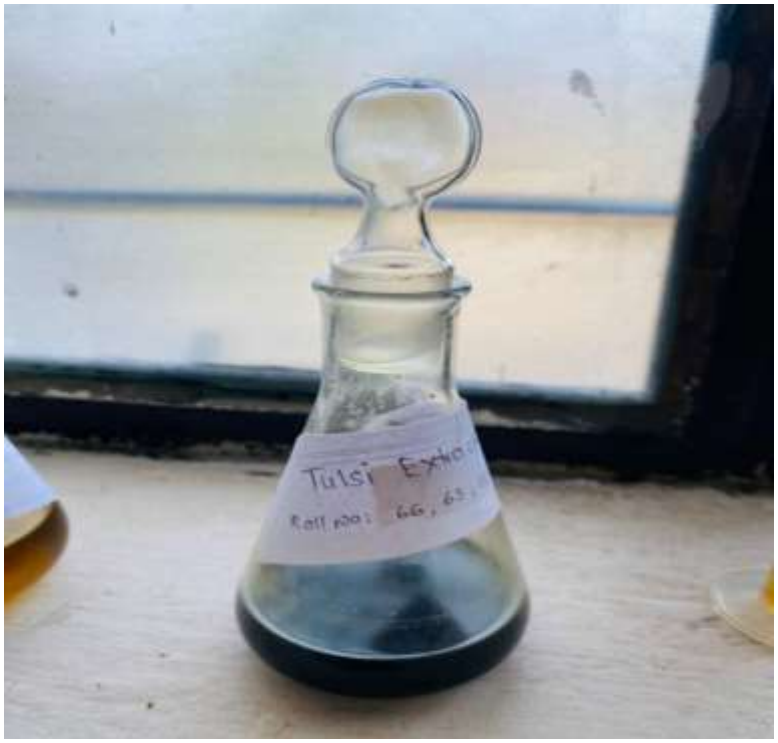


Fig.: Tulsi Liquid Extraction

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Formula

Sr no.	Drugs	Quantity	Uses
1	Tulsi	20%	Anti- tussive
2	Ginger	15%	cold or sore throat.
3	Clove	10%	Helps to reduce Cold sinusitis
4	Vasaka	20%	Cough and flu
5	Fennel	10%	Freshen breath
6	Honey	25%	Reduce night time coughing

PROCEDURE

Step 1: Take Round bottom flask add 20 ml Tulsi liquid extract into them
Step 2: Add 40 ml mixture of Ginger, vasaka, fennel, and Clove liquid extract and boil them
Step 3: Add 20 ml Honey into them
Step 4: Make solution perfectly soluble and into container



Fig.: Tulsi Extraction



Fig.: Ginger, Vasaka, Fennel ,& Clove Extraction

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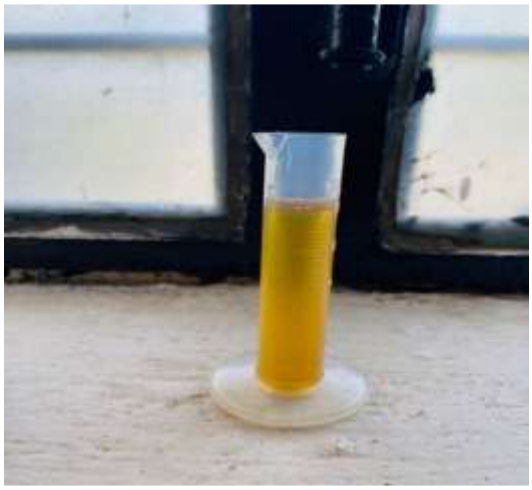


Fig: Honey(2)

EVAULATION TEST

1. pH Meter

With the help of pH meter, the pH Tulsi Extraction of Cough Syrup can be detected.
pH=6.62

2. Visual Inspection

It as an inspection of an asset made using only the naked eye. The green solution is detected in visual inspection. To verify the product is free of any foreign particles.

3. Physical Characteristics

Color: Natural Green
Odor: Strong aroma and an astringent.
Taste: Bitter Flaver

4. Detection of foreign particles:

Foreign particles were detected with the help of white & black background instrument.
There are no any foreign particles in the syrup.



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Fig : Clarity Test Appratus

Result

Extraction of Chemical Constituents from Tulsi & Their Formulation for Cough Syrup was prepared and evaluated. The test methods described in this project are presented as example of suitable formulation of cough syrup. A collection of recommended herbal medicine for assessing the Expectorant Activity & also content of herbal materials, intended to assist national laboratories engaged in pharmaceutical evaluation tests. The publication includes expectorant activities of herbal medicines. It includes the detail description of the preparation & formulation of expectorant by using Tulsi. The mostly herbal expectorant medicine is Tulsi, ginger, clove, Vasaka fennel honey etc. We also study the evaluation tests of cough syrup. In the evaluation test its physical characteristics, visual inspection, pH of cough syrup was described.

SUMMARY AND CONCLUSION

As many peoples occur cough, some time the coughing person undergo various other diseases.

The various Herbal medicines are there are Tulsi, Ginger, vasaka, fennel, Honey and Clove. The Herbal Cough Syrup show less side effect &fatly recovered the cough.

The various evaluation test was examined to Tulsi cough syrup. The World- wide in the world mostly cough is normal disorder. The various Herbal medicines are used in herbal cough syrup. The Herbal medicines are showing the less side effects as compared to synthetic cough syrup.

The simple formulation of cough syrup is very effective to treat cough. The various Evaluation of Herbal Cough Syrup also examined and detected.

The formulated herbal cough syrup proved to be a safe, effective, and palatable alternative to synthetic cough syrups. The use of traditional herbs like Tulsi, Ginger, and Licorice provided synergistic effects to relieve cough, soothe sore throat, and reduce inflammation.

The syrup showed acceptable organoleptic properties (taste, color, smell) and passed quality control tests, including microbial safety. The natural ingredients minimized the risk of side effects commonly associated with allopathic cough formulations.

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