

Formulation & Evaluation of Herbal Cough Syrup

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Abstract: Preparations presently used to treat cough are among the world's most widely used over-the-counter drugs. Currently available cough suppressants primarily act on the central cough pathway. The significant side effects of these agents such as constipation, respiratory depression, dependence, drowsiness, and Death from this action limit their use in humans and are thus highly unsatisfactory. The survival of Ayurveda Medicine is generating a surge of interest. As the risks and shortcomings of modern medicine have become increasingly evident, there has been a shift towards the use of herbal medicine on a global scale. The bulk of Ayurvedic formulations are made from herbs. The syrup is a popular dosage form of cough and cold medications, Easing patient compliance

An ancient time peoples use various plant, roots, and leaves for treatment various disease. Herbal Cough syrup is an Ayurveda medicine which is useful in many chronic health problem such as Cough, cold, fever, respiratory infection and disorders among human. As a combination of herbs, It is safe, can be made at home, has a low production cost, and can be easily available in any area. Herbal syrup including natural herbs, like tulsi, clove, fennel, turmeric and adulsa which have Various action and effect on reducing acute or chronic cough and cold and act as cough Suppressant having expectorant and anti-tussive property. In this research, I conclude about herbal Cough syrup that, herbal cough syrups is a safest herbal medicine which is use for treatment of Cough and cold.

The most common problem suffered by individuals everywhere over many centuries is cough. Coughing is the Protective mechanism of the body. Coughs are classified further accordingly which are depending upon factors such as Signs and symptoms, duration, type, character, etc. Most commonly used, prepared and popular dosage form to cure Cough and cold is syrup. The most preferred dosage form to cure cough is herbal syrup, which is used mostly due to its Benefits over synthetic syrups. Medicinal plants are used as primary health care agents, mostly in Asian countries. Ingredients showing expectorant antitussive activity are used. Hereby cough and herbal treatments associated with Cough are studied briefly. The herbal cough syrup is studied which is liquid dosage form, it is easy to administer than Solid dosage form and is more effective and fast acting in order to cure cough. Method of preparation of cough syrups Were discussed. The material and quantity used in preparation were listed. Here honey based three batches were Performed having concentration such as 35%, 40%, 45% w/v. the quality of final syrup was evaluated for post Formulation studies..

Keywords: Cough, Herbal Syrup, Herbal formulation, Herbal treatment

I. INTRODUCTION

Herbal medicine is also known as phyto-medicine or herbalism it is a medicine that use Plantsor their crude products for the treatment of diseases. It may include also animal fungi or Bacteria product. Since ancient era, herbal or plant-based medicines has been used for the Prevention, cure & mitigation of diseases and time to time more and more herbal constituents of These natural sources are get enhanced.

Herbal medicine has its origins in ancient cultures. It Involves the medicinal use of plants to treat disease and enhance general health and wellbeing. Some herbs have potent (powerful) ingredients and should be taken with the same level of caution As pharmaceutical medications.

In fact, many pharmaceutical medications are based on man-made versions of naturally Occurring compounds found in plants. For instance, the heart medicine digitalis was derived from The foxglove plant. Herbal medicine aims to return the body to a state of natural balance so that it Can heal itself. Different herbs act on different systems of the body.



The another name for “Cough” is “tussis”, the voluntary or involuntary act which clears the throat and breathing passage Of foreign particles, microbes, irritants, fluids and mucus is nothing but cough. It is the rapid expulsion Of air from lungs. When we have blockage or irritation in the throat or upper air passage, the brain thinks a foreign Element is there in body and it inform body immediately to cough to expel out foreign element out of our body.

The Cough reflex consists of the 3 phases which are an inhalation, a forced exhalation against a closed glottis, and a violent Release of air from the lungs following opening of the glottis, and followed by a distinctive sound.

It is symptom related to most respiratory problems such as asthma, viral infections, lung cancer, tuberculosis, pulmonary Embolus . The repetition of coughing produces inflammation and discomfort, which result in more Coughing in individual [Sultana et al, 2016]. Respiratory tract infections are mostly common in children; some of them Are self- limiting and the risk of complication may be very small

Herbal cough syrup

A herbal syrup is prepared by combining a concentrated decoction with either honey or sugar, and Sometimes alcohol. Herbal plants and formulations are used for the many types of diseases like Cough syrup and many more other diseases. The content of herbal cough syrup include: - funnel, Clove, tulsi, honey

Types of herbal syrup

- 1.Flavored syrup
- 2.Medicated syrup
- 3.Artificial syrup

Advantages of cough syrup

- ☐ No side effect
- ☐ Low cost
- ☐ Easily available
- ☐ No harmless
- ☐ Herbs grow in common place

Disadvantages of cough syrup

- ☐ Not suitable in emergency and for unconscious patients.
- ☐ Dose precision cannot be achieved unless suspension is packed in unit dosage forms. ➤ Same microbial contamination take place it preservation not added in accurate Proportion.
- ☐ Fluctuation in storage temperature may cause crystallization of sucrose from saturated Syrup.

Types of cough

1) Dry cough

- Productive and effective cough
- Signs associated for dry cough
- i.Sensitive throat
- ii. Non mucus expelled
- iii. Short, dry and frequent cough
- iv. Persistent or constant tickle [Ken , 2021, Herbycin, 2020].
- Medicine: Cough suppressant and antitussive.

2) Wet cough

- Non effective and infective cough



- Signs associated with wet cough
 - i. Coughs up phlegm
 - ii. Wheezing
 - iii. Chest tightness
 - iv. Difficulty in breathing [Patil et al, 2020, Herbycin, 2020].

- Medicine: Expectorant.

Coughs in pediatrics

A cough is a sign that indicates that the child's body is trying to get out of itself from irritant, pollutants, and other Foreign particles. Cough is one of the most common problems of visiting parents with their child to healthcare Practitioner. Common causes of cough include:

- 1) Allergies or sinusitis: It can cause a prolonged cough including an itchy throat, runny nose, watery eyes, sore Throat, or rash. Allergy tests are done to find out which allergens cause the problem and doctor advice how to avoid Those allergens.
- 2) Asthma: Asthma can be very difficult to diagnose in children as symptoms may vary from every child to child. While wheezing cough, that get worse at night is one of the many signs. The other cough occurs with increased in Physical activities like playing, exercise, etc. Treatment for asthma is dependent upon what is actual cause of it.
- 3) Infection: Cold, flu, and croup this leads to a prolonged cough for children. Colds cause mild to moderate hacking Cough while the flu a sometimes cause severe, dry cough and croup has a "barking" cough mostly occurs at night with Noisy breathing.
- 4) Other reasons children cough: Children's may also cough as they get habit of coughing after sick with a Cough, after inhaling a foreign element like food or a small object, or in contact with irritants like pollution, cigarettes Smoke or firecrackers smoke.

LITERATURE REVIEW

Ankush Ganpat Patil et al (2020); This review suggested that syrup is used commonly for dosage form, which Is used to treat cough and cold for the reason that it has ease patient compliance.

Alka Saxena et al (2020); This demonstrated that interest regarding the survival of Ayurvedic forms of medication. In the global, there is a move towards the use of herbal origin as the danger and the shortcoming of modern medicine have started getting more apparent majority of the ayurvedic formulation are prepared from herbs. The syrup is a very popular dosage form of cough and cold medications to ease patient compliance.

Yasmeen Jahan et al (2015); This review suggested despite a recent survey, medications intended to treat cough Remain among the most popular over-the-counter medicines in the world.

Suggesting that there is little proof that These medications have any significant effectiveness.

Ashutosh Meher (2012); This review demonstrated that Coughing is a protective reaction of the respiratory system that helps to open up the upper airways and shouldn't be stopped without cause.

A cough is thought to be caused by a reflex. It occurs due to stimulation of mechano-or Chemoreceptors in the throat, respiratory passage, or stretch Receptor in the lungs hese

Luisa Wagner et al (2015); Acute cough symptoms commonly Result from infection (upper respiratory tract Infection (URTI) or Common cold) or environmental exposure to smoke and/or allergens. Whilst most people Experience a cough at least once in their lives, its frequency is linked to factors such as gender and allergen Sensitivity. There is no evidence that any classic mucolytic, Including N-acetyl cysteine (NAC), eases patients' Symptoms by Helping them to expectorate mucus. Trials of over-the-counter Remedies, such as cough syrups And cough suppressants, have also failed to produce consistent, objective benefits.

Vaijayanti Gaikwad et al (2016); This review states that acute cough represents the most common illness evaluated in outpatient settings. Available remedies for its management are generally allopathic combinations of antihistamines and decongestants that achieve antitussive activity, but often with unpleasant side effects prompting the need to explore safer and more effective options. Honitus is an Ayurvedic proprietary herbal cough syrup with the



benefits of honey, intended to provide relief in acute non-productive cough and throat irritation without causing drowsiness. This study investigated the safety and efficacy of onions in reducing acute non-productive cough and throat irritation in comparison to a standard marketed allopathic cough syrup intended for use in similar conditions.

Mohamed A. Farag et al (2020); Liquid cough preparations containing essential oils pose a challenge for Isolating and quantifying their volatile components from such a complex matrix enriched with non-volatile Constituents and excipients. Cough preparations were subjected to headspace solid-phase microextraction for Determination of their essential oil composition mediating for their actions and to assess volatile differences Among them. HSSPME is a suitable technique for sample preparation that allows for extraction and enrichment Of volatiles from complex non-volatile matrices and their direct desorption into the gas chromatography Analytical system

Shahnaz Sultana et al (2016); Cough occurs suddenly and often repetitively which helps to clear the large Breathing passages from secretions, irritants, foreign particles, and microorganisms. Coughing can be due to a Respiratory tract infection such as the common cold, acute bronchitis, pneumonia, pertussis, flu, and smoking or Health problems Such as asthma, tuberculosis, and lung cancer. Substantial uses of folk remedies for different Medical conditions Have been documented.

Anu Kaushik (2020); From the global perspective, there is a shift towards the use of medicine of herbal origin, as the dangers and the shortcoming of modern medicine have started getting more apparent, majority of Ayurvedic formulations are prepared from herbs. s

Aim and objectives

Aim:-Formulation and Evaluation of herbal cough syrup

Objectives:

- ☐ It can relieve symptoms of cold and cough such as congestion, coughing and sore throat.
- ☐ It can help soothe and improve the respiratory system.
- ☐ It can boost the immune system and helps the body fight infection.
- ☐ It can reduce inflammation in respiratory system.
- ☐ It can help to loosen and expel mucus from the lungs, thus providing relief from congestion.
- ☐ It can reduce coughing and help you sleep better.
- ☐ It is a natural and safe alternative to prescription medication.

Formulation Table

Sr.no	Ingredient	Quality	Use
1	Fennel	10 ml	Flavouring agent
2	Clove	10 ml	Expectorant
3	Tulsi	10 ml	Antitussive
4	Haldi	10 ml	Antitussive
5	Honey	10 ml	Base

Plane of work:-

- ☐ Collection of material
- ☐ Selection of herbal drug
- ☐ Method of preparation
- ☐ Evaluation test of cough syrup
- ☐ Conclusion



HERBS USED IN COUGH SYRUP

Following herbal parts are used in the formulation of herbal cough syrup

- 1) FENNEL
- 2) CLOVE
- 3) TURMERIC
- 4) TULSI
- 5) HONEY



Figure 1 of ingredient

FENNEL



Figure 2 Fennel Synonyms:-

Large Fennel, Sweet Fennel, Fennel fruit, Saunf (Hindi); Fructus Foeniculi.

Biological source: -

Fennel is the dried, ripe fruits of *Foeniculum vulgare* Mill. (Family: Apiaceae) Geographical source:-

Fennel is indigenous to Mediterranean region of Asia and Europe. It is widely cultivated in Russia, India, Japan, southern Europe, China and Egypt.



Chemical constituents:-

Fennel contains volatile oil (2-6.5%) and fixed oil (12%). The main constituent of the volatile oil Are phenolic ether, anethole (50-60%) and the ketone, fenchone (18-20 %) which give the fruit its Distinct odour and taste; the other constituents of volatile oil are anisic aldehyde, anisic acid, α -Pinene, dipentene and phellandrene.

Uses:-

1. Fennel is used as stimulant, aromatic, stomachic, carminative, and expectorant.
2. Anethole is used In mouth and dental preparations.
3. Fennel is used in diseases of the chest, spleen and kidney..

CLOVE



Figure 3 Clove Buds

Synonyms:-

Caryophyllus, Clove buds, Caryophyllum; Caryophylli; Laung (Hindi).

Biological source: -

Cloves are the dried flower buds of *Eugenia caryophyllata* Thumb (Syn. *Syzygium aromaticum*. (Family: Myrtaceae).

Geographical source:-

The clove tree is native of Molucca Island. It is cultivated in Zanzibar, Sumatra, South America, West Indies, Brazil, Pemba, Ambon, Madagascar, Mauritius, Tanzania, Sri Lanka and South India.

Chemical Constituents: -

Clove contains 14-21% of volatile oil. The other constituents present are the eugenol, acetyl

Eugenol, gallotannic acid, and two crystalline principles; α - and β - caryophyllenes, methyl

Furfural, gum, resin, and fiber. Caryophylline is odorless component and appears to be a Phytosterol, whereas eugenol is a colorless liquid. Clove oil has 60-90% eugenol, which is the Cause of its anesthetic and antiseptic properties.

Uses:-

1. Used for upset stomach
2. As an expectorant clove is used for diarrhea hernia and bad Breath

TULSI:-



Figure 4 Tulsi Leaves



Synonyms:-

Sacred basil, Holy basil

Biological Source:-

Tulsi consists of fresh and dried leaves of *Ocimum sanctum* Linn. (Syn. *Ocimum tenuiflorum*) Family Lamiaceae, and contains not less than 0.40 per cent eugenol on dried basis.

Geographical Source: -

It is herbaceous, multi branched annual plant found throughout India. It is considered as sacred by Hindus. The plant is commonly cultivated in garden and also grown near temples. It is Propagated by seeds, Currently Tulsi is cultivated commercially for its volatile oil.

Chemical constituents:-

It contains approximately 70 per cent eugenol, carvacrol (3%) and eugenol-methyl-ether (20%). It Also contains caryophyllin. Seeds contain fixed oil with good drying properties.

Uses:-

1. The oil is antibacterial and insecticidal.
2. The leaves are used as stimulant, aromatic, antidiarrheal, Spasmodic, and diaphoretic.
3. Tulsi has expectorant and anti-Inflammatory properties.

TURMERIC :-



Figure 5 Turmeric rhizomes

Synonyms:-

Curcuma

Biological source:-

Turmeric is prepared rhizome of *Curcuma longa* Linn. (Zingiberaceae). It is perennial herb Of ginger family, having thick rhizome; native to Southern Asia; extensively cultivated in India, Chedonesia and other tropical countries.

Chemical Constituents:-

Turmeric contains 3-7% orange-yellow colored volatile oil which is mainly composed of Turmerone (60%), α , β -atlantone and zingiberene (25%) with minor amounts of 1,8 cineole, α - Phellandrene, δ sabinene and borneol. Others than above it contains yellow coloring matter Including 0.3-5.4%.

Uses:-

1. It is used as an antioxidant in capsules tablets and flavouring tea.
2. It is recommended as a food Supplement to treat liver problems menstrual difficulties hi marej test pain etc.



HONEY:-



Figure 6 honey

Biological Source :Honey is a natural product formed from nectar of flowers by honeybees *Apis Mellifera*.

Family: Apidae

Chemical constituents :Honey contains trace amounts of the B vitamins riboflavin, niacin, folic acid, Pantothenic acid and vitamin B6. It also contains ascorbic acid (vitamin C), and the minerals calcium, Iron, zinc, potassium, phosphorous, magnesium, selenium, chromium and manganese.

Uses :

- i. Expectorants
- ii. In asthmatic
- iii. Cough syrup
- iv. Nasal decongestant.

EXTRACTION PROCESS:-

Decoction of fennel, tulasi , Clove and Turmeric:-

- 5-7 gm of each herbal ingredients
- Herbs was mixed using 500ml of water
- Attach reflux condenser and material was boil under carefully by using water bath for 3 Hrs.
- Boil until total volume become one forth part of previous
- Then liquid was cooled and filtered.

Method of preparation

- To prepared final Cough syrup macerated clove fennel and turmeric was mixed with tulsi extract
- Add honey as sweating agent of base
- Herbal Cough syrup was prepared



EVALUATION TEST:-

1) Colour examination

- i. 5ml of prepared syrup was taken on a watch glass.
- ii. Watch glass placed against white background in white tube light.
- iii. Colour was observed by naked eyes.

2) Odour examination

- i. 2 ml of prepared syrup was taken and smelled by individually
- ii. The time interval between 2 smelling was 2 min. to nullify effect of previous smelling.

3) Taste examination

- i. A pinch of final syrup was taken and examined on taste buds of the tongue.

4) pH determination

- i. 10 ml of prepared syrup taken in 100 ml of volumetric flask
- ii. Make up volume to 100 ml with distilled water
- iii. Sonicate for 10 min
- iv. pH was measured by using digital pH meter.

II. CONCLUSION

An ancient time peoples use various plant, roots, and leaves for treatment various disease. Herbal cough syrup is an Ayurveda medicine which is useful in many chronic health problem Such as cough, cold, fever, respiratory infection and disorders among human. As a combination Of herbs, it is safe, can be made at home, has a low production cost, and can be easily available In any area. Herbal syrup including natural herbs, like tulsi, clove, fennel, turmeric and adulsa Which have various action and effect on reducing acute or chronic cough and cold and act as Cough suppressant having expectorant and anti-tussive property. In this review, I conclude about Herbal cough syrup that, herbal cough syrups is a safest herbal medicine which is use for Treatment of cough and cold.

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