

FORMULATION AND EVALUATION OF HERBAL COUGH SYRUP

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ABSTRACT :

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.

KEYWORDS : Grinding, Extraction, Anti-microbial activity.

1. INTRODUCTION

Herbal medicine is also known as phyto-medicine or herbalism it is a medicine that use plants or 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.(1)

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.(1)

Herbal medicine system beneficial over Allopathy system:

Although allopathy has been the most acceptable system of medicine over the years, people are now shifting back to the utilization of herbal medicine. This is due to the setbacks of allopathic medicine like it is very expensive, it has serious and frustrating side effects, its relief from ailments is only symptomatic and fear of toxicity to allopathy drugs.

Herbal medicine like Ayurveda and Homeopathy are preferred in the treatment of chronic diseases because of the characteristic features of Ayurveda like it is less costly and more sensible,

exactly aligns with the patient's thoughts, more easily accessible, time tested, it's said to be more natural and safer and it is thought to have fewer or no negative effects.

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, cinnamon, pudina, adulsa.

Types of herbal syrup

- Flavored syrup
- Medicated syrup ➤ 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

Wet cough	Dry cough
<ul style="list-style-type: none"> ☐ Productive and effective cough. ☐ It expels secretion mucous or foreign Material from respiratory tract. ☐ The main purpose of wet cough is to remove the foreign matter or mucous from Respiratory tract by which infection is caused. 	<ul style="list-style-type: none"> ☐ Non effective and infective cough. ☐ It expels secretion or mucous from lungs. Dry cough is chronic in nature and it caused by dry irritation, smoke, or dust. ☐

2. MATERIAL AND METHOD OF PREPARATION

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

1. FENNEL
2. CLOVE
3. ADULSA
4. TURMERIC
5. TULSI



Figure 1 Herbal 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:-

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

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: Used for upset stomach and as an expectorant clove is used for diarrhea hernia and bad breath(1).

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:-

The oil is antibacterial and insecticidal. The leaves are used as stimulant, aromatic, anticatarrhal, spasmolytic, and diaphoretic. The juice is used as an antiperiodic. Tulsi has expectorant and anti-inflammatory properties.(2)

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, China Indonesia 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:-

It is used as an antioxidant in capsules tablets and flavouring tea. It is recommended as a food supplement to treat liver problems menstrual difficulties hi marej test pain etc.(3)

ADULSA:-



Figure 6 Adulsa Leaves

Synonyms: -

Malabar nut, Adhatoda vasica

Biological source: -

The biological source of vasaka is dried and fresh leaves of this plant. It belongs to family acanthaceae.

Chemical constituents:-

The chemical constituent of vasaka are alkalis tannins flavonoids Serpent sugar and glucoside. The leaves of Osaka contain Vitamin C in large amount. The roots of these plant contain vasicinolone, basil and peganine.

Uses:-

Used as expectorant. It is used to treat leprosy blood disorder thirst and vomiting. It is used to treat infertility it also have anti-ulcer activity.

3. FORMULATION:-

EXTRACTION PROCESS:-

Decoction of fennel, 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.(10)



Figure 7 Extraction of clove, fennel & turmeric

Preparation of leaf extract of adulsa:-

Fresh leaves of *A. vasica* were harvested and thoroughly washed in tap water. 50m of leaves were macerated to paste with the help of sterilized mortar and pestle with 50ml tap water and it was filtered through muslin cloth. The filtrate was kept frozen at 4°C and used in subsequent experiments as stock solution.



Figure 8 Extraction of adulsa

Extraction of tulsi:-

Leaves of *Ocimum sanctum* L. tulsi were collected from different sites washed with sterile water and 50g of tulsi was placed in the thimble of soxhlet apparatus with 50ml of water and 50 ml of ethanol over 24hr.



Figure 9 Extraction of tulsi



Figure 10 Extract of Adulsa, clove, fennel, turmeric, tulsi & lemongrass

METHOD OF PREPARATION OF COUGH SYRUP:-

To prepared final cough syrup macerated clove, fennel, and turmeric was mixed with of Adulsa extract and tulsi extract



Add lemon grass extract as flavoring agent and methyl paraben : propyl paraben as a preservative



Herbal cough syrup was prepared and solubility was checked by observing clarity of solution visually.

**FORMULATION TABLE:-
FOR BOTTLE A**

Sr.no	Ingredient	Quantity	Use
1	Fennel	3 ml	Aromatic, flavoring agent
2	Clove	3 ml	Expectorant
3	Haldi	3 ml	Antitussive
4	Adulsa	5 ml	Antitussive
5	Tulsi	7 ml	Antitussive
6	Methyl paraben: propyl paraben	2:1	Preservative
7	Lemon grass	Q.S	Flavoring agent
8	Sucrose	25 ml	Base

FOR BOTTLE B

Sr.no	Ingredient	Quantity	Use
1	Fennel	4 ml	Aromatic, flavoring agent
2	Clove	4 ml	Expectorant
3	Haldi	4 ml	antitussive
4	Adulsa	6 ml	Antitussive
5	Tulsi	4 ml	Antitussive
6	Methyl paraben: propyl paraben	3:1	Preservative
7	Lemon grass	Q.S	Flavoring agent
8	Sucrose	25 ml	Base

4. EVALUATION TEST:-

1) Colour examination

1. 5ml of prepared syrup was taken on a watch glass.
2. Watch glass placed against white background in white tube light.
3. Colour was observed by naked eyes.(10)

2) Odour examination

1. 2 ml of prepared syrup was taken and smelled by individually
2. The time interval between 2 smelling was 2 min. to nullify effect of previous smelling.(10)

3) Taste examination

A pinch of final syrup was taken and examined on taste buds of the tongue.(10)

4) pH determination

1. 10 ml of prepared syrup taken in 100 ml of volumetric flask
2. Make up volume to 100 ml with distilled water
3. Sonicate for 10 min
4. pH was measured by using digital pH meter.(10)

5) Viscosity determination

The viscosity of each formulation was determined by using Ostwald's U-tube viscometer

6) Determination of density

1. Density of the syrup is determine by using density bottle method by measuring the weight and volume. Density is calculated as a substances mass per the volume it occupies
2. The symbol "p" is used to denote density.10)

7) Determination of anti-microbial activity

Agar cup plate method was used for screening of antimicrobial activity of herbal cough syrup. The formulations were placed aseptically in cups of agar plate which was previously inoculated with culture. The plates were left at ambient temperature for 30 min. prior to incubation at 37°C for 24 hrs. The antibiotic i.e. Amikacin was used as positive control for obtaining comparative results. Plates were observed after 24-48 hrs. incubation for the appearance of the zone of inhibition. Antimicrobial activity was evaluated by measuring the diameter of zones of inhibition (millimeters) of microbial growth



Figure 11 Formulation A & B of herbal cough syrup

5. RESULTS AND DISCUSSION: -**Table 1: - In this test colour, odour and taste of formulation was checked**

Formulation	Colour	Odour	Taste
A	Yellowish brown	Aromatic	Slightly-pungent
B	Yellowish brown	Aromatic	Slightly-pungent

Table 2:- pH observation

Formulation	pH
A	6
B	6.2

Table 3:- viscosity observation

Formulation	Viscosity
A	1.51 cp
B	1.30 cp

Table 4:- Density

Formulation	Density
A	1.157 gm/ml
B	1.195 gm/ml

Anti-microbial activity of formulated herbal cough syrup was observed:-

Formulation A & B are evaluated for it's in-vitro anti-microbial activity by using standard amikacin. From the zone of inhibition, the formulation B was found more superficial toward anti-microbial activity as compared to formulation A.



Figure 12 Antimicrobial activity of herbal cough syrup

6. 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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