

Formulation and Evaluation Of herbal syrup

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ABSTRACT-

Cough is a powerful explosive emission that clears the tracheobronchial tract of fluids and foreign materials. The purpose of this review paper was to document the plants used to treat and relieve coughs. Problems associated with the use of conventional opioid cough suppressants, such as codeine and codeine-like substances, to treat cough in a range of respiratory disorders. Medicinal plants have the ability to produce chemicals with strong antitussive properties and low adverse effects. In the current study, Prepared Herbal Syrup contains ginger macerate, honey base and also cinnamon, cardamom, tulsi, fenel, black pepper is utilized as expectorant and antipyretic. Herbal cough syrup is an Ayurvedic treatment that can help with a variety of chronic health issues, including coughing, colds, fevers, respiratory infections, and other human illnesses. As an herb combination, it is safe, can be created at home, has a low manufacturing cost, and is widely available. The goal of this review is to examine the current state of the plant, which is utilized as a food source, antitussive, and expectorant to treat coughs, as well as its active constituents. The quality of the finished herbal syrup was assessed both before and after formulation using criteria such as density, specific gravity, pH, and several organoleptic properties.

Keywords-

antitussive, cough, expectorant, herbal syrup, medicinal plants

I. INTRODUCTION

1.1 Cough-

A cough, also known as tussive, clears the throat and breathing passages of foreign particles, bacteria, and mucus. It can be voluntary or involuntary (1). This is one of the most prevalent health issues. Coughing can be caused by respiratory tract infections including the common cold, acute bronchitis, flu, smoking, pneumonia, pertussis, flu, smoking, or health conditions like asthma, tuberculosis, and lung cancer. Infections such as bacterial, viral, or fungal can cause infla-

mmation and moisture in the lungs, leading to cough. It can cause fevers and make breathing difficult. Coughing occurs when the throat or airways get irritated. An irritant activates your nerves, sending a signal to your brain. It is among the most frequent health conditions. Coughing can be caused by respiratory infections such as the common cold, acute bronchitis, pneumonia, pertussis, flu, smoking, or health conditions like asthma, tuberculosis, and lung cancer (2). Most acute coughs (less than three weeks) are caused by the common cold.

Coughs can be classified as wet or dry.

1.1.1 Wet cough-

- i. Non-productive cough.
- ii. It expels secretion mucous or foreign material from respiratory tract.
- iii. The main purpose of wet cough is to remove the foreign matter

1.1.2 Dry cough-

- i. productive cough.
- ii. It expels secretion or mucus from lungs.
- iii. Dry cough is chronic in nature and it is caused by dry irritation

Mucus-filled coughs, often known as wet coughs, are common during illnesses such as the flu, colds, and pneumonia (3). Clearing mucus from the respiratory system can leave patients with a sticky and damp feeling at the back of their throat (4).

When a cough does not produce mucus, the throat feels dry and tickly. Asthma, croup, allergies, and other disorders can cause digestive system inflammation, leading to these symptoms (5). Diagnosis of cough includes methacholine challenge testing, sputum (mucus) testing, imaging studies including CT scans or X-rays of the chest, spirometry, and blood tests (6).

1.2 Herbal treatment in cough-

Cough is protective reflex, intended to remove irritants and accumulated secretion from the respiratory passages. The drugs used in the symptomatic treatment of cough.

1. Antitussives–

These are drugs that act in the CNS to raise the threshold of cough centre or act peripherally in the respiratory tract to reduce tussal impulses, or both these actions. Example -cinnamon, vasaka leaf

2. Pharyngeal Demulcent -Demulcent are used to lubricate and protect the alimentary mucous membrane, but the term is usually applied only to those agents that affect the buccal, pharyngeal, oesophageal, and gastric mucosa. Example – honey

3. Expectorants-

They increase the volume of bronchial secretion and decrease viscosity of the sputum hence cough becomes less tiring and productive. Example-lemon, Liquorice

4. Mucolytics- These agents break the thick tenacious sputum and lower the viscosity of sputum, so that sputum comes out easily with less effort. Example - pineapple juice

Herbal plants and formulas treat a variety of ailments, including cough syrup. Cough syrup contains many different types of herbal plants, such as ginger, Tulsi, honey, and clove. Herbal medicine has traditionally been made from whole plants. Herbal formulations are extensively employed as health care aids in both developed and developing countries. Nowadays, herbal treatments are routinely utilized to cure coughs. Herbal medications and formulations are effective in treating many forms of coughs. Cough suppressants are now commonly used to treat coughs. The antitussive medication only provides symptomatic relief. The agents are contraindicated in asthma. They can induce major side effects such as respiratory depression, vomiting, nausea, drowsiness, and decreased respiratory reserve. In recent years, researchers have focused on herbal medicines that have fewer negative effects.

1.3 HERBAL SYRUP-

An herbal syrup is prepared by combining a concentrated decoction with either honey or sugar, and sometimes alcohol. Herbal plants and formulations are used for many types of diseases like cough syrup and many more other diseases. The content of herbal cough syrup includes: - cinnamon, cardamom, funnel, tulsi, cinnamon, ginger, black pepper etc. It is defined as a thick sticky liquid consisting of a concentrated solution of sugar and water with or without addition of flavouring agent

or medicinal substance (7). Herbal syrup is made by combining a concentrated plant decoction with honey, sugar, or alcohol. The herbal syrup is made by the decoction procedure. Mixing herbs with honey thickens and preserves the mixture. formulation. This was responsible for extending the shelf life of the formulation. Adding honey can improve the taste of certain herbs (8).

Advantages of Herbal Syrup (9)

- 1) No Side Effect.
- 2) No Harmless.
- 3) Easily Available.
- 4) Easy to Adjust the dose for child's weight.
- 5) No nursing is required, which main and the patient can take it with no help.
- 6) Herbs Grow in common place.
- 7) Good patient compliance especially paediatric patients as syrup is sweet in taste.
- 8) It is a preservative by retarding the growth of bacteria, fungi, and mould as osmotic pressure.
- 9) Low cost.

Disadvantages of Herbal Syrup (9)

- 1) Sedimentation of solid occasionally gives foot from product.
- 2) Dose precision cannot be achieved unless suspension is packed in unit dosage forms.
- 3) Same microbial contamination taken place if preservation not added in accurate proportion.
- 4) Also, herbal medicine having another disadvantage is the risk of self-dosing of herbs which is very rare.

II. HERBS USED IN SYRUP

1.4 CINNAMON

Synonyms-

cortex cinnamon, Ceylon cinnamon, Cinnamomum aromaticum,

Biological Source-

Cinnamon is the dried inner bark of the coppiced shoots of *Cinnamomum zeylanicum* Nees.

Family-Lauraceae



FIG.NO. 1- CINNAMON

Chemical Constituents-

cinnamon contains about 10% of volatile oil, tannin, mucilage, calcium oxalate and sugar. Volatile oil contains 50 to 65% cinnamaldehyde, along with 5 to 10% eugenol, terpene hydrocarbons and small quantities of ketones and alcohols.

Uses-

Stomachic, carminative, stimulant, mild astringent and antiseptic.

1.5 CARDOMOM

Synonyms - Ilachi, Ailum, Cardamom seed, Cardamomi semina **Biological Source-** Cardamom consists of the dried ripe seeds of *Elettaria cardamomum* Maton.

Family- Zingiberaceae.



FIG NO. 2- CARDOMOM

Chemical Constituents- The seeds contain 3 to 6% of volatile oil along with fixed oil, salts of potassium, a colouring principle, nitrogenous mucilage, an acrid resin, starch, ligneous fibre, and ash. The active constituent of the volatile oil is cineole. Other aromatic compounds present are terpinyl acetate, terpineol, borneol, terpinene, etc.

Uses- used as an aromatic, carminative, stimulant, stomachic, expectorant, diaphoretic, digestive, appetizer, and flavouring agent. It is used in the treatment of respiratory disorders like asthma, bronchitis, cough, nausea, vomiting, indigestion, headache, diarrhoea, colds, for flatulence

1.6 BASIL

Synonyms- Sacred basil, Holy basil.

Biological source-

Tulsi consists of fresh and dried leaves of *Ocimum sanctum* Linn.

Family- Labiatae.



FIG.NO.3-BASIL

Chemical constituents-

Pleasant Volatile oil (0.1 to 0.9%) Also consist 70% Eugenol and carvacrol (3%) eugenol methyl-ether (20%)

Uses - The fresh leaves, its juice and volatile oil are used for various purposes. The oil is antibacterial and insecticidal. The leaves are used as stimulant, aromatic, spasmolytic, and diaphoretic

1.7 FENNEL

Synonyms - Fructus foeniculli, Fennel fruit, Fenkel, Florence fennel **Biological Source-** Fennel consists of the dried ripe fruit of *Foeniculum vulgare* Miller.

Family- Umbelliferae

Chemical Constituents-

Fennel contains 4 to 5% of volatile oil. The primary



FIG.NO. 4 – FENNEL

constituents of volatile oil are 50 to 60% of anethole, a phenolic ester; and 18 to 22% of fenchone, a ketone. Fennel also contains about 20% fixed oil and 20% proteins.

Uses- Fennel is used as a stomachic, aromatic, diuretic, carminative,

diaphoretic, as a digestive, pectoral, and flavouring agent. Anethole may have estrogen-like activity and inhibit spasms in smooth muscles.

1.8 GINGER

Synonyms-Rhizoma zingiberis, Zingiber

Biological Source-

Ginger consists of the dried rhizomes of the Zingiber officinale Roscoe,

Family - Zingiberaceae

Chemical Constituents-
1 to 2% volatile oil, 5 to 8%

Ginger contains



FIG. NO. 5- GINGER

pungent resinous mass and starch.

Volatile oil is composed of sesquiterpene hydrocarbon like α -zingiberol; α -sesquiterpene alcohol α -bisabolene, α -farnesene, α -sesquiphellandrene

Uses- Ginger is used as an antiemetic, positive inotropic, spasmolytic, aromatic stimulant, carminative, condiment, and flavouring agent. It is prescribed in dyspepsia, flatulent colic, vomiting spasms, as an adjunct to many tonics and stimulating

remedies, for painful affections of the stomach, cold, cough, and asthma. Sore throat, hoarseness, and loss of voice are benefited by chewing a piece of ginger.

1.9 BLACK PEPPER

Synonyms-Kalimirch, Milagu-Milagu.

Biological Source-

It consists of dried unripe fruits of Pippernigrum Linn.

Family-Piperaceae

Chemical Constituents-

Piperidine group of alkaloids: Piperine, Piperidine



FIG.NO.6 –BLACK PEPPER

Piperettine, Piperonal, Camphen, Pinene, Citronellol, Resin, Starch (30%).
Arginine, Ascorbic acid, Carotene Thiamine and riboflavin.

Uses- Carminative, Stomachic. Stimulant, Flatulent, Antiarthritis, Useful in sore throat, piles and dyspepsia and Useful in treatment of gonorrhoea and chronic bronchitis.

1.10 HONEY

Synonyms-Madhu, Madh, Mel, Purified Honey

Biological Source-

Honey is a viscous and sweet secretion stored in the honey comb by various species of bees, such as Apis mellifera, Apis dorsata, Apis florea, Apis indica and other species of Apis,



FIG.NO.7- HONEY

Family-Apidae

Chemical Constituents- Moisture 14–24%, Dextrose 23–36%, Levulose (Fructose) 30–47%, Sucrose 0.4–6%, Dextrin and Gums 0–7% and Ash 0.1–0.8%. Besides, it is found to contain small amounts of essential oil, beeswax, pollen grains, formic acid, acetic acid, succinic acid, maltose, dextrin, colouring pigments, vitamins and an admixture of enzymes, for example, diastase, invertase and inulase.

Uses- Honey shows mild laxative, bactericidal, sedative, antiseptic and alkaline characters. It is used for cold, cough, fever, sore eye and throat,

tongue and duodenal ulcers, liver disorders, constipation, diarrhoea, kidney and other urinary disorders, pulmonary tuberculosis, marasmus, rickets, scurvy and insomnia.

III. MATERIAL AND METHOD-

1.11 Following are the herbal plants used in formulation of herbalsyrupana Formulation table:-

SR.NO.	INGREDIENTS	ROLE/USES	Quantity -A
1	CINNAMON	Antitussive,Expectorant	4gm
2	CARDOMOM	Flavouring agent,Antioxidant,Digestive aid	3gm
3	TULSI	Antibacterial, Antitussive	12-20 leaves
4	FENNEL	Expectorant,Antioxidant,Flavouring agent	4gm
5	GINGER	Antitussive	3gm
6	BLACKPEPPER	Antioxidant	1gm
7	HONEY	Expectorant,Base,Sweetening agent,preservatives	45%

1.12 collection of plants:-

The leaves of *O. sanctum* were collected from the campus area and cinnamon, cardamom, fennel, ginger, black pepper was purchased from the local market and dried in sunlight for 2 days and then powdered in mortar to form a fine powder.

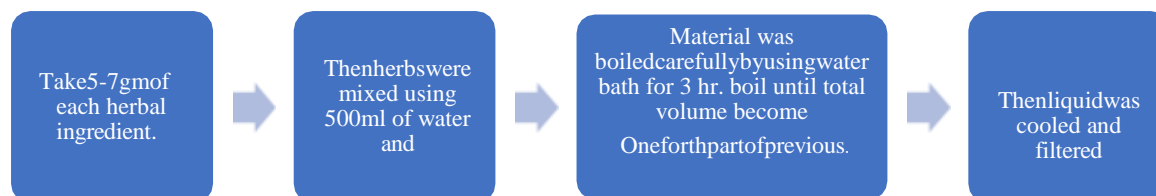
cardamom, fennel ginger, black pepper is boiled in 100 ml distilled water individually for about 1 hour. In conical flask strain the extract of each ingredient by using filter paper and cool at room temperature for 30 minutes.

In another beaker 12 to 15 leaves of *O. sanctum* /tulsi leaves were boiled in 100 ml of distilled water for about 1 hour and then strained by filter paper and let it cool down at room temperature.

1.13 Preparation of extract:-

According to the formulation table the required quantity of all the powders i.e. cinnamon,

1.14 Method of preparation of decoction



1.15 Method of maceration

The 25 ml of honey was taken

2 gm of ginger mixed with 25 ml of honey in beaker and cover it.

beaker allowed to stand at room temperature for 24 hours

after 24 hours the preparation filtered and used in final herbalsyrup

1.16 Preparation of final herbalsyrup

The final herbalsyrup was prepared and then subjected for evaluation.

Herbalsyrup was prepared and solubility was checked by observing clarity of solution visually.

IV. EVALUATION

1. Ash value: An Ash test involves taking a known 5 gm of sample, placing the weighed sample into a dried / pre-weighed porcelain crucible, burning away the crude drug in an air atmosphere at temperatures above 500°C, and weighing the crucible after it has been cooled to room temperature in a desiccator.

2. Viscosity: Thoroughly clean Ostwald viscometer with warm chromic acid and if necessary used. An organic solvent such as acetone mount viscometer in vertical position on suitable stand. Fill water in dry viscometer up to mark G. Count time required, in second for water to flow from mark A to mark B. Repeat step 3 at least three times to obtain accurate reading. Rinse viscometer with test liquid and then fill up to mark A, find out the time required for liquid to flow to mark B.

Formula for viscosity:

Density of test liquid \times Time required to flow test liquid
Density of water \times time required to flow water

3. PH Test: - Determine the pH of syrup by suitable means; it should be 6.0 to 7.0.

4. Turbidity Test: - It is used to determine the concentration of suspended particles in a sample of water by measuring the incident light scattered at right angle from the sample. The scattered light is captured by photodiode which produces an electronic signal that is converted to turbidity.

5. Visual inspection:-

With visual inspection, the ingredients and the final product are carefully examined for purity and appearance. Physical appearance of product for patient adherence compliance is critical so that it should be good looking and elegant in appearance.

6. Physical stability: - The syrups must be stable physically e.g., its appearance (no crystallization and microbial growth). Colour must be completely soluble with other ingredients. Odour and taste (palatable). Solid material is completely miscible in liquid.

V. RESULT

The result obtained in this study suggests that herbal formulation prepared and possess antitussive activity. The component of herbal cough formulation was selected due to their reported action that plays preventative and curative role in prevention of cough. Syrup prepared passes all physical parameters and shows significant antitussive activity.

SR.NO.	PRARAMETER	OBSERVATION/VALUE
1	COLOUR	YELLOWISHBROWN
2	ODOUR	AROMATIC
3	PH	6.2
4	VISCOSITY	0.0492

EVALUATION RESULT: -

We perform following test and result might be given below:-

1. Total Ash value of cinnamon: -3.1% w/w

Extractive value of cinnamon:-

water soluble 17.65% w/w Alcohol soluble: - 9.4 % w/w

2. Total Ash value of Cardamom:-12% w/w

Extractive value of cardamom:-water soluble:-4% w/w Alcohol insoluble: - 1.5

3. Total Ash value of black pepper: - 4.98 % w/w Extractive value of black pepper:-water soluble:- 3.19 Acid insoluble: - 0.93

4. Total Ash value of fennel:-9% w/w

Extractive value of fennel:-water soluble:-16% Acid insoluble: - 0.50%

5. Total Ash value of ginger:-2.3% w/w

Extractive value of ginger:-water soluble:-4.0% w/w Acid insoluble: -3.6% W/W

VI. CONCLUSION

An ancient time people use various plant, roots, and leaves for treatment various disease. Herbal cough syrup is an Ayurveda medicine which is useful in many chronic health problems 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 cinnamon, cardamom, tulsi, fennel, black pepper and honey 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, we conclude about herb cough syrup that, herbal cough syrup is a safe herbal medicine which is use for treatment of cough and cold.

The formulation studies of all this formulation

were within specification also the physicochemical properties of prepared syrup like colour, odour taste, ph, viscosity, were satisfactory but among the formulation it was within the all specification it has proper concentration of honey as per ip and also good preservative.

The present study helps to develop effective and safe herbal 50% w/v honey as a base of cough syrup. Clinical trials and stability studies are needed of future concern.

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