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DEVELOPMENT AND ASSESSMENT OF HERBAL SYRUP FORMULA

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ABSTRACT
Cough is a forceful expulsion that clears the tracheobronchial tract of fluids and foreign materials. This review paper documents the use of medicinal plants to treat and alleviate coughs, addressing concerns associated with conventional opioid suppressants like codeine in treating various respiratory disorders. Medicinal plants offer strong antitussive properties with fewer adverse effects. In this study, a Herbal Syrup was prepared containing ginger macerated in a honey base, supplemented with cinnamon, cardamom, tulsi, fennel, and black pepper, known for their expectorant and antipyretic properties. This Ayurvedic remedy supports treatment for chronic health issues including coughs, colds, fevers, respiratory infections, and other ailments. The herbal combination is safe, cost-effective, can be prepared at home, and readily available. The review aims to explore the current use of these plants as food sources, antitussives, and expectorants in treating coughs, highlighting their active constituents. Quality assessment of the formulated herbal syrup included parameters such as density, specific gravity, pH, and organoleptic properties.

KEYWORDS: antitussive, cough, expectorant, herbal syrup, medicinal plants

INTRODUCTION
1.1 Cough A cough, also known as tussive, serves to clear the throat and respiratory passages of foreign particles, bacteria, and mucus [1]. It can occur voluntarily or involuntarily and ranks among the most prevalent health issues. Coughs can stem from various causes, including respiratory tract infections such as the common cold, acute bronchitis, flu, smoking, pneumonia, pertussis, asthma, tuberculosis, and lung cancer [2]. Infections, whether bacterial, viral, or fungal, can inflame and moisten the lungs, triggering coughing episodes that can complicate breathing and induce fevers.

1.1.1 Wet Cough i. Non-productive cough. ii. Expels secretion mucous or foreign material from respiratory tract. iii. Main purpose is to remove the foreign matter.

1.1.2 Dry Cough i. Productive cough. ii. Expels secretion or mucous from lungs. iii. Chronic nature and caused by dry irritation.
Mucus-filled coughs, categorized 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]. Conversely, when a cough does not produce mucus, the throat feels dry and tickly. Conditions like asthma, croup, allergies, and other disorders that affect the respiratory system can cause these symptoms [5]. Diagnosis of cough involves various methods such as methacholine challenge testing, sputum (mucus) testing, imaging studies like CT scans or X-rays of the chest, spirometry, and blood tests[6].

1. **Antitussives** Antitussives are drugs that act either centrally in the CNS to raise the cough threshold or peripherally in the respiratory tract to reduce tussal impulses, or both. Examples include cinnamon and vasaka leaf.
2. **Pharyngeal Demulcent** Demulcents are used to lubricate and protect the mucous membranes of the alimentary tract. This term typically applies to agents affecting the buccal, pharyngeal, esophageal, and gastric mucosa. An example is honey.
3. **Expectorants** Expectorants work by increasing the volume of bronchial secretion and reducing the viscosity of sputum, making coughs less tiring and more productive. Examples include lemon and liquorice.
4. **Mucolytics** Mucolytics break down thick, tenacious sputum and lower its viscosity, making it easier to expel with less effort. An example is pineapple juice.

Herbal plants and formulations are used to treat various ailments, including coughs, through preparations like herbal syrup. Such syrups often contain a variety of herbs such as ginger, Tulsi, honey, and clove. Traditional herbal medicines are typically derived from whole plants and are widely used as healthcare remedies in both developed and developing countries. Today, herbal treatments are frequently employed for alleviating coughs. While cough suppressants are commonly used for symptomatic relief, they are contraindicated in asthma and can lead to significant side effects such as respiratory depression, vomiting, nausea, drowsiness, and reduced respiratory reserve. In recent years, researchers have focused on herbal medicines that offer fewer adverse effects.
Herbal syrup is typically made by combining a concentrated plant decoction with honey, sugar, or alcohol, often used to treat various ailments including coughs. The ingredients commonly include cinnamon, cardamom, fennel, tulsi, ginger, black pepper, among others. It's known for its thick, sticky consistency and its ability to preserve herbal properties.

Advantages of herbal syrup include no side effects, ease of availability, and good patient compliance, especially among children due to its sweet taste. It's also cost-effective and can be adjusted easily for dosing.

On the downside, sedimentation of solids and the challenge of achieving precise dosing without unit dosage forms are noted issues. There's also a risk of microbial contamination if preservation methods are not properly managed.

Would you like me to remember these details about herbal syrup and its pros and cons for future conversations?

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Herbs Used in Syrup

1.4 Cinnamon Synonyms: Cortex cinnamon, Ceylon cinnamon, Cinnamomum aromaticum
Biological Source: Cinnamon is derived from the dried inner bark of the coppiced shoots of Cinnamomum zeylanicum Nees.

Family: Lauraceae

FIG.NO. 1- CINNAMON

Chemical Constituents

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

Uses

Cinnamon is used as a stomachic, carminative, stimulant, mild astringent, and antiseptic.

1.5 Cardamom

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% volatile oil, along with fixed oil, potassium salts, a coloring principle, nitrogenous mucilage, an acrid resin, starch, ligneous fiber, and ash. The active constituent of the volatile oil is cineole. Other aromatic compounds present include terpinyl acetate, terpineol, borneol, terpinene, etc.

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Uses

Cardamom is used as an aromatic, carminative, stimulant, stomachic, expectorant, diaphoretic, digestive, appetizer, and flavoring agent. It is employed in the treatment of respiratory disorders such as asthma, bronchitis, cough, nausea, vomiting, indigestion, headache, diarrhea, and colds.

1.6 BASIL

Synonyms: Sacred basil, Holy basil.

Biological source: Tulsi consists of fresh and dried leaves of Ocimum sanctum Linn.

Family: Labiatae.

1.7 FENNEL

Synonyms: Fructus foeniculi, Fennel fruit, Fenkel, Florence fennel.

Biological source: Fennel consists of the dried ripe fruits of Foeniculum vulgare Miller.

Family: Umbelliferae.

Chemical Constituents: Fennel contains 4 to 5% of volatile oil. The primary constituents include a pleasant volatile oil (0.1 to 0.9%), which consists of approximately 70% eugenol and carvacrol (3%), and eugenol methyl ether (20%).

Uses: The fresh leaves, juice, and volatile oil of fennel are utilized for various purposes. The oil is known for its antibacterial and insecticidal properties. The leaves are used as stimulants, aromatics, spasmolytics, and diaphoretics.

FIG.NO.3-BASIL

FIG.NO. 4 – FENNEL

1.8 GINGER

Synonyms: Rhizoma zingiberis, Zingiber.

Biological Source: Ginger consists of the dried rhizomes of Zingiber officinale Roscoe.

Family: Zingiberaceae.

Chemical Constituents: Ginger contains 1 to 2% volatile oil and 5 to 8%

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FIG. NO. 5- GINGER

1.15 Methodofmaceration

RESULTS

The results obtained from this study suggest that the herbal formulation prepared possesses antitussive activity. The components of the herbal cough formulation were selected based on their reported actions, which play a preventive and curative role in managing cough. The syrup prepared passed all physical parameters and demonstrated significant antitussive activity.

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

CONCLUSION

Since ancient times, people have relied on various plants, roots, and leaves for treating various diseases. Herbal cough syrup, an Ayurvedic medicine, proves beneficial for managing chronic health issues such as coughs, colds, fevers, and respiratory infections among humans. As a herbal combination, it offers safety, affordability, and easy availability, even for homemade preparation. Herbal syrups, including natural herbs like cinnamon, cardamom, tulsi, fennel, black pepper, and honey, exhibit diverse actions that effectively reduce acute and chronic coughs. They act as both cough suppressants and expectorants due to their antitussive properties. In conclusion, this review highlights herbal cough syrup as a safe herbal remedy for treating coughs and colds. The formulation studies of all these syrups

met specific physicochemical properties such as color, odor, taste, pH, and viscosity, ensuring quality. Among these formulations, those meeting all specifications include proper concentrations of honey as per IP standards and effective preservatives. This study contributes to the development of effective and safe herbal syrup using 50% w/v honey as a base for cough treatment. Future considerations should include clinical trials and stability studies to further validate its efficacy and safety.

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