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Formulation and Evaluation of Herbal Cough Syrup

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Abstract: *We wanted to make a cough medicine using only natural things instead of artificial chemicals that might be bad for you. More and more people in India are getting asthma because of things in the environment, and when you have asthma, your chest can get really congested, making it hard to breathe and causing coughs. So, we came up with a cough syrup made from herbs and other natural stuff. Then, we looked at how well our herbal syrup worked compared to cough syrups you can buy that are made with chemicals and other herbal syrups already out there.Some of the cough syrups that have artificial ingredients can cause problems like making people feel confused or even see things that aren't real. Our herbal syrup, though, uses special parts taken from two plants: Adhatoda vasica (it's also called Vasa) and Syzygium aromaticum (that's cloves!). We also added other natural ingredients. We think this syrup will help open up your breathing passages and make you cough less.People have used Adhatoda vasica for a long time to help with coughs. Scientists have also found that it can kill germs, reduce swelling, and protect your body from damage. Our findings suggest that using the leaves of the Adhatoda vasica plant is really good for treating coughs and doesn't seem to cause many bad side effects. This makes it look like a safe and good option to use instead of cough syrups made with artificial.*

Keywords: Cough Relief, Expectorants, Cough Syrup, Vasaka, Neem, Honey, Turmeric, Tulsi

I. INTRODUCTION

A cough can happen due to infections from bacteria, viruses, or fungi, causing inflammation and fluid in the lungs. This can lead to fever and trouble breathing. Coughing is the body's way of reacting to irritation in the throat or airways. When something irritates these areas, it sends signals to the brain. Vasaka cough syrup is a sweet liquid that contains ingredients to help reduce coughing. In India, more and more people are suffering from asthma, making it important to find effective treatments.

Asthma is a long-term lung condition that affects people of all ages and is caused by inflammation and tightening of the muscles around the airways, making it hard to breathe. The Vasaka plant, also known as thyme, has properties that help loosen mucus in the lungs and soothe coughs. The leaves of *Adhatoda vasica* contain compounds like vasicine and vasicinone, which help open the airways and reduce coughing.

Syzygium aromaticum, or clove, contains eugenol and other compounds that can help treat respiratory issues like asthma and bronchitis. Both plants are used to help with coughs and skin problems. This article aims to explore how Vasaka leaves can help manage coughing.

History :

In 1895, Bayer, a German company, introduced a cough syrup called "Heroin." It was made with a lot of sweeteners like sugar and glucose to make it taste good. In India, Fourrts Laboratories made the syrup. It was first sold as a way to relieve coughs, but later it was discovered to be very addictive, so it was taken off the market.

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Diagnosis of Cough :

To figure out why someone has a cough, doctors use tests like methacholine challenge tests, mucus tests, chest X-rays or CT scans, spirometry, and blood tests. It's useful to have relevant information ready for the doctor. Common causes of a cough in adults include acute bronchitis and viral infections like the common cold. Most bronchitis cases are caused by viruses, but about 10% are due to bacteria.

Types of Cough :

Coughs are usually categorized as wet or dry. Wet coughs produce mucus and often happen with colds, the flu, or pneumonia. They help clear mucus from the throat. Dry coughs don't produce mucus, leaving the throat feeling tickly. These can be caused by asthma, allergies, or other conditions. Depending on the type, you can use either a dry cough syrup or a wet cough syrup.

Chronic Cough Treatment :

There isn't a lot of solid research on treating chronic cough in children. While some information exists, it's not enough to create strong treatment recommendations. Some reviews have looked into how to manage chronic cough, but more studies are needed to find better treatments.

Pharmacological Action :

1) Decongestant :

Decongestants in children's over-the-counter cold medicines usually include pseudoephedrine or phenylephrine. These medications help shrink swollen blood vessels in the nose, reducing congestion. They can also increase heart rate, so they should be used carefully in children with heart issues or certain health conditions. Topical decongestants, like nasal sprays, work directly on the nose to reduce swelling with minimal side effects. For infants, saline drops and humidified air can help clear congestion by thinning mucus.

2) Cough suppressant :

Dextromethorphan is a common cough suppressant found in many OTC cough medicines and is often mixed with guaifenesin, which helps clear mucus. It works by acting on the brain to reduce the cough reflex. Side effects can include drowsiness and dizziness. Diphenhydramine, an antihistamine, is also used as a cough suppressant, but how it works for this purpose isn't fully understood.

3) Expectorant :

Guaifenesin is the main expectorant in the U.S. It helps make mucus thinner and easier to cough up. However, studies show it may not significantly improve breathing or reduce mucus thickness, making its usefulness unclear.

Antihistamine

Common antihistamines like diphenhydramine, chlorpheniramine, and brompheniramine are found in cold and allergy medications. They block histamine, which helps reduce allergy symptoms and nasal congestion. However, research indicates that they don't help with the common cold or shorten symptoms but can be effective for allergies.

For allergic rhinitis (like hay fever), treatments usually include:

Antihistamines: These medicines block the chemical (histamine) that causes sneezing, itching, and a runny nose. Some older antihistamines can make you sleepy and are not safe for babies because they can cause breathing problems.

Decongestants: These help clear a stuffy nose, but using them in infants can be dangerous, as they might cause breathing issues.

Fever and Pain Relievers: Cold medicines often have acetaminophen (Tylenol) or ibuprofen to reduce fever and pain.

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For herbal cough treatment:

1.Saponins :-These help your body produce more mucus to clear out the airways, but too much can upset your stomach and cause vomiting or diarrhea.

2.Flavonoids :-These natural compounds help reduce cough and improve mucus clearing. They also have anti-inflammatory effects.

3.Essences :-These come from aromatic plants and help the airways by making them produce more mucus and moving it out. They can also fight bacteria but might cause side effects if used too much.

4.Mucilage :-This is a type of natural remedy that coats your throat and airways, reducing irritation and calming dry, itchy coughs.

Gum :

1) Gums are substances found in plants that become sticky when they absorb water.

2 Purpose: In plants, they help protect the plant when it's injured.

3) Medicinal use: Some plant gums, like peach gum, can help reduce coughing.

Pectin :

What it is: Pectin is a natural substance found in fruits, especially citrus fruits like oranges.

Medicinal use: It protects the stomach lining and can also help reduce coughing, similar to certain cough medicines.

 # Research Method:

The researchers used databases like PubMed and Embase to find studies on cough in children, especially chronic cough. They focused on studies involving real patients, limiting the search to high-quality trials, and avoided opinion pieces or unreviewed studies. The research was finalized in 2014.

 # HERBS USED IN COUGH SYRUP :

Figure No. 1

Vasaka :

Synonym : Adhtoda, Adulsa

Biological sources: It is dried and fresh leaves of Adhatoda vasica or Malabar nut

Family :Acanthaceae.

Chemical Constituents:Vasicine, Vasicinone, 6-hydroxy vasicine, and adhatodic acid.

Uses :

Expectorants

In asthmatic patients

cough syrup.

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2) Tulsi :

Figure No. 2

Synonym : Tulas ,Tulsi

Biological source: Tulsi consists of the fresh and dried leaves of Ocimum species like Ocimum sanctum L. and Ocimum basilicum L.

Family:- Labiateae

Chemical Constituents :- Phytochemical studies have shown that oleanolic acid, ursolic acid rosmarinic acid, eugenol carvacrol, linalool, and β-caryophyllene are some of the main chemical constituents of Tulsi.

Uses :

Expectorants

In asthmatic patients

Cough syrup

Nasal decongestant

3) Clove :

Figure No.3

Biological Source: Cloves consist of dried flower buds of Eugenia caryophyllus.

Family: Myrtaceae

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Chemical Constituents :Eugenol is the major compound, accounting for at least 50%. β-caryophyllene Uses :
In asthmatic patients
Cough syrup • Nasal decongestant

4) Ginger :

Figure No. 4

Biological Source : Ginger is a flowering plant whose rhizome of Zingiber officinale .
Family :Zingiberaceae
Chemical constituents :Ginger is abundant in active constituents, such as phenolic and terpene compounds.and paradols. In fresh ginger, gingerols are the major polyphenols.
Uses :
Expectorants
Cough syrup
Nasal decongestant.
Expectorant

5) Honey :

Figure No. 5

Biological Source :Honey is a natural product formed from nectar of flowers by honeybees Apis mellifera.
Family: Apidae

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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 :

Expectorants

In asthmatic patients

Cough syrup

Nasal decongestant.

Simple Syrup :

Simple syrup is a basic solution made by dissolving sucrose (sugar) in purified water. It's a fundamental ingredient in many . cocktails and culinary preparations.

Example:Sucrose :- 66.7ml Purified water:- 100ml

Medicated syrup :

A medicated cough syrup is a syrup that contains medicinal ingredients to help alleviate cough symptoms.

Example :-Ginger syrup Strong Ginger tincture5 mL Syrup q.s.100 mL.

Flavoured Syrup :

Flavored vehicles are syrups that add flavor without medicinal properties.

They're often used to mask unpleasant tastes in medications..

Example: Cherry & Raspberry syrup.

Active Pharmaceutical Ingredients	**Quantity**
Adhatoda vasica	15 ml
Ocimum basilicum L.	10ml
Eugenia caryophyllus.	3ml
Zingiber officinale .	3ml
Apis mellifera.	q.s.

Evaluating the Herbal Syrup:

The syrup's physical and chemical properties like density, pH, alcohol content, and color, as well as its taste and smell, are tested according to Indian Pharmacopoeia standards.

Color	Greenish brown
Odour	Sweet Aromatic
Taste	Sweet
PH	4.8
Density	1.37

Checking the Color÷

Pour 5 mL of syrup into a small dish.

Put it on a white background under good light.

Look at the syrup to see its color.

Checking the Smell÷

Smell 2 mL of syrup.

Wait 2 minutes before smelling again so you can notice the scent clearly.

Checking the Taste÷

Take a small amount of syrup and put it on your tongue.

See how it tastes using your taste buds.

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pH Test (Simplified):

Take 10 mL of the syrup and add it to a 100 mL flask.
Fill the flask with distilled water up to the 100 mL mark.
Shake the mixture with a machine for 10 minutes.
Use a digital pH meter to measure the pH.

II. CONCLUSION (SIMPLIFIED)

The plant helps open airways and relieve cough.
Its leaves are traditionally used to treat coughs.
In this study, the leaves and flowers were effective in reducing cough and inflammation due to compounds like flavonoids.

III. FUTURE SCOPE (SIMPLIFIED)

The cough syrup market is expected to grow in the future, with more interest in natural and herbal products.
People prefer natural remedies like polyherbal cough syrup because they don't contain artificial ingredients that may cause side effects.

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