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"A REVIEW ON FORMULATION AND EVALUATION OF POLYHERBAL COUGH SYRUP "

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ABSTRACT

One of the most prevalent respiratory symptoms linked to allergies, infections, or environmental irritants is coughing. Unwanted side effects like drowsiness, gastrointestinal distress, and medication resistance are frequently caused by traditional synthetic cough syrups. The need for safe and efficient herbal substitutes made from medicinal plants with established therapeutic potential is therefore growing. The creation and assessment of herbal cough syrups utilizing traditional herbs like Adhatoda vasica (Vasaka), Ocimum sanctum (Tulsi), Glycyrrhiza glabra (licorice), Zingiber officinale (ginger), and honey are the main topics of this review. These components assist ease cough and throat irritation because they have antitussive, expectorant, anti-inflammatory, antibacterial, and calming qualities. In order to guarantee quality, safety, and efficacy, the review also compiles a number of evaluation parameters, such as stability studies, microbiological load, phytochemical analysis, and physicochemical testing.

KEYWORDS:

Adhatoda vasica, Ocimum sanctum, Glycyrrhiza glabra, Zingiber officinale, herbal cough syrup, antitussive, expectorant, medicinal herbs, phytochemical evaluation, natural formulation, stability studies

INTRODUCTION

Coughing helps rid the respiratory system of mucus, irritants, and infectious substances. It is a frequent protective reflex. It can result from a number of things, including allergies, infections, pollutants, and other respiratory

conditions. Even though there are a number of artificial cough syrups on the market, their extended usage is restricted due to potentially harmful side effects like sleepiness, nausea, and reliance.

Herbal therapy has become increasingly popular in recent years as a safer and more comprehensive method of treating respiratory conditions including coughs. Herbal remedies blend organic components with medicinal qualities like antitussive, expectorant, anti-inflammatory, antibacterial, and calming actions. Adhatoda vasica (Vasaka), Ocimum sanctum (tulsi), Glycyrrhiza glabra (licorice), Zingiber officinale (ginger), and other plants Coughing facilitates the removal of mucus, irritants, and infectious materials from the respiratory system. It is a common defensive reaction. Numerous factors, such as allergies, infections, pollution, and other respiratory disorders, can cause it. Although there are several artificial cough syrups available, their prolonged use is limited because of potentially dangerous side effects such dependence, nausea, and drowsiness.In recent years, herbal treatment has grown in popularity as a more thorough and safe way to treat respiratory ailments, such as coughing. Herbal medicines combine natural ingredients with therapeutic properties such as soothing, antimicrobial, antitussive, expectorant, and anti-inflammatory effects. Glycyrrhiza glabra (licorice), Adhatoda vasica (Vasaka), Ocimum sanctum (tulsi), Zingiber officinale (ginger), and other plants.

EXCIPIENTS' FUNCTION IN HERBAL COUGH SYRUP

In pharmaceutical formulations, excipients are inert ingredients that give the finished product stability, palatability, and the appropriate physical properties. Excipients are essential for maintaining product stability, patient acceptability, and uniformity in herbal cough syrup without compromising the medicinal effectiveness of the herbal components.

1. **Agents for Sweetening**

Examples include glycerin, sucrose, sorbitol, and honey.

Function: Serve as a basis for the syrup, boost viscosity, and enhance taste and palatability. By lowering water activity, sucrose also serves as a preservative.

2. Thickening agents and viscosity enhancers

Examples include xanthan gum, tragacanth, and sodium carboxymethyl cellulose (CMC).

Function: Improve mouthfeel, avoid suspended particle deposition, and provide the right consistency.

2. **Preservatives**

Examples include propyl paraben, methyl paraben, and sodium benzoate.

Function: Prevent the growth of microorganisms and prolong the syrup's shelf life, particularly in watery formulations.

3. **Agents for Solubilization**

Examples include ethanol, propylene glycol, and glycerin.

Function: Improve the solubility of essential oils and herbal extracts that don't dissolve well in water.

5. **Agents of Flavor**

examples Orange taste, peppermint oil, lemon oil, and menthol.

Function : Increase patient compliance by masking the bitter or disagreeable taste of several herbal preparations.

6. **Colorants**

Examples include chlorophyll, caramel, and approved natural food coloring.

Function : Give the product a visually appealing appearance and aid in product identification.

7. **Agents and Buffers for pH Adjustment**

Examples include sodium citrate and citric acid.

Function : Keep the pH at an appropriate level to guarantee stability and stop the breakdown of active phytoconstituents.

ADVANTAGES OF COMBINING DIFFERENT HERBS

One of the core ideas of traditional medical systems like Ayurveda is the use of several plants in a single composition. Combining several herbs can have a synergistic therapeutic impact that increases effectiveness, decreases toxicity, and expands the range of activity. Such mixtures are essential for addressing several cough causes and symptoms at once in the creation of herbal cough syrups.

1. The Effect of Synergy:- The total therapeutic result is improved when herbs with complimentary pharmacological activities are combined. For instance, Glycyrrhiza glabra has calming and demulcent properties, while Adhatoda vasica functions as a bronchodilator and expectorant. When combined, these two plants provide quicker and more thorough cough alleviation.

2. Action on Multiple Targets:- Cough is frequently a complex illness that involves irritation, inflammation, and infection. Comprehensive symptom management can result from a multi-herb mixture that concurrently addresses many pathways, including antibacterial, anti-inflammatory, and mucolytic actions.

3. Diminished Adverse Reactions:- Compared to utilizing a single herb at a high dose, employing several herbs at lower individual concentrations can lessen the chance of negative effects. Herbs' inherent balancing qualities contribute to their safety and tolerability.

4. Enhanced Adherence by Patients:- Herb combinations frequently improve the syrup's overall flavor, scent, and calming qualities, making it more palatable—especially for young patients and older patients.

5. Antiviral and Antimicrobial Activity:-Natural antibacterial and antiviral properties found in many herbs, including tulsi, ginger, and honey, aid in the fight against respiratory pathogens and the avoidance of secondary infections.

6. Calming and Calming Impact:- Honey and Glycyrrhiza glabra create a protective layer on the mucous membrane, which eases discomfort and calms the throat.

7. Advantages of Immunomodulation :- Frequent use of herbal remedies that contain turmeric, ginger, and tulsi help strengthen the body's defenses against respiratory infections.

PLANT PROFILE

1. GINGER

fig:-1

Synonyms: Adrak , Ardraka, Ale

Biological Source :

The dried or fresh rhizomes of Zingiber officinale Roscoe (Family: Zingiberaceae) are used to make ginger.

Chemical Components:

Zingiberene, Zingiberol, Camphene, and Cineole are volatile oils. Pungent principles: Zingerone, Gingerols, and ShogaolsAdditional ingredients include organic acids, proteins, fibers, starches, and resins.

Applications and Therapeutic Uses:

- Carminative: Reduces indigestion and flatulence Stimulant: Improves circulation and digestion.
- Antiemetic: Good for motion sickness and nauseaAnti-inflammatory: Beneficial for muscle soreness and arthritis.
- Antioxidant and antimicrobial: Prevents infections.
- Use of respiratory remedies for colds, coughs, and sore throats.

2.TULSI

Fig :- 2

Synonyms: Basil.

Origin in Biology:

The fresh or dried leaves and aerial portions of Ocimum sanctum Linn are used to make tulsi.

Lamiaceae (Labiateae) is the family.

Chemical Components:

Caryophyllene, Linalool, Eugenol, and Methyl Eugenol are volatile oils.

Phenolic substances: Ursolic acid and Rosmarinic acid

Flavonoids: Luteolin and Apigenin

Other: Glycosides, Saponins, and Tannins

Applications and Therapeutic Uses:

- Antimicrobial: Works well against viruses, fungi, and bacteria
- Antioxidant: Prevents oxidative damage
- Anti-inflammatory: Lessens pain and swelling
- Expectorant: Beneficial for asthma, colds, and coughs
- Adaptogenic: Aids in stress management
- Antipyretic: Reduces temperature
- Conventional Applications:utilized in Ayurvedic remedies for stomach, skin, and respiratory conditions.

3.CLOVE

Fig :- 3

Synonyms: Aromatic Caryophyllus, Laung

Origin in Biology: The dried flower buds of Syzygium aromaticum (Linn.) Merr. & L.M. Perry are used to make cloves. The Myrtaceae family

Chemical Components:

15–20% volatile oil is the main active ingredient.

Main component: eugenol (around 70–90%)

Acetate eugenyl , β-Caryophyllene, Tannins, Resins, Flavonoids, Triterpenes

Applications and Therapeutic Uses:

- Analgesics and antiseptics are frequently used to treat mouth infections and toothaches.
- Antimicrobial: Works well against fungus and bacteria
- Stimulant and carminative: aids in digestion and eases flatulence
- Antioxidant: Prevents oxidative damage to bodily cells
- Local anesthetic: Because it contains eugenol
- Conventional Applications:used to treat dental pain with clove oil component of numerous Unani and Ayurvedic formulas added to cuisine as a seasoning and spice.

4. Vasaka

Fig :-4

Synonyms: Adulsa.

Origin in Biology: Adulsa is made up of Justicia adhatoda Linn.'s leaves and aerial parts (also known Nees).

Chemical Components:

Alkaloids:Vasicine, the primary active ingredient, Vasicol, Vasicinol, and Vasicinone.

Glycosides: Tannins,Saponins, Essential oils.

Applications and Therapeutic Uses:

- Expectorant: Encourages the respiratory tract's mucus to be cleared.
- Bronchodilator: Beneficial for coughing, bronchitis, and asthma.
- Antimicrobial: Works well against a range of fungus and bacteria.
- Anti-inflammatory: Lessens respiratory tract irritation
- Antitussive: Aids in cough relief.

5.HONEY

Fig :- 5

Synonyms: Madhu.
Origin in Biology: Honeybees (Apis mellifera, Apis indica, and other species) gather honey, a sweet secretion, from blossom nectar.Family: Apidae (not a plant product; animal origin)

Chemical Constituent:

Carbs (about 80%),About 38% fructose ,Approximately 31% glucose ,Traces of sucrose, maltose, and dextrin ,15–20% water
Enzymes and Proteins: Glucose Oxidase, Diastase, flavonoids.

Applications and Therapeutic Uses:

- Demulcent & Calming Agent: Reduces coughing and throat irritation Because of its low pH and hydrogen peroxide content, antimicrobials prevent the growth of bacteria. Wound Healing: Encourages tissue repair and guards against infection.
- Nutritional: Gives you energy right away.
- Antioxidant: Prevents oxidative damage to cells.
- Conventional Applications: utilized as Yogavahi (enhancer of medicinal qualities) in Ayurvedic medicine. frequently found in digestive tonics, cough syrups, and skincare products.

RESULT

Herbal cough syrups made from medicinal plants like Adhatoda vasica (Vasaka), Ocimum sanctum (Tulsi), Glycyrrhiza glabra (licorice), Zingiber officinale (ginger), and Curcuma longa (turmeric) have strong antitussive, expectorant, antimicrobial,and anti-inflammatory qualities, according to a review of numerous studies and formulations. The quality and consistency of herbal formulations are verified by evaluation factors like pH, viscosity, specific gravity, total solid content, phytochemical screening, microbiological load, and stability testing. These findings show that herbal syrups maintain therapeutic efficacy and safety while meeting acceptable physicochemical and microbiological criteria.

CONCLUSION

Herbal medicine has the potential to be a safe, affordable, and efficient substitute for synthetic cough medicines, as evidenced by the development and testing of herbal cough syrup. The herbal mixture works in concert to improve respiratory health and immunity while relieving cough, throat discomfort, and congestion. Herbal formulations can be standardized using appropriate evaluation methodologies to guarantee consistent quality, are well-tolerated, and do not have any negative side effects.To develop stability profiles, large-scale manufacturing standards, and dosage optimization, more investigation and clinical validation are advised. All things considered, using herbal cough syrup to treat cough and associated respiratory conditions is a comprehensive and long-term solution.

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