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Research Article

Evaluation and Formulation on Polyherbal Cough Syrup

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ABSTRACT

Preparation presently used to treat cough are among the world's most widely used over the country. Currently available cough suppressants primarily act on the central pathway. There are two types of coughs 'Dry cough and Wet cough'. The dry cough is without mucous and wet cough is with mucous or secretion. The significant side effects of these agents such as constipation, respiratory depression, dependence, drowsiness, and death from action limit their use in humans and are thus highly unsatisfactory. The cough syrup is most used and popular dosage form; it is used for curing cough and cold because it is having case of patient's compliance. The polyherbal cough syrup are formulated using various crude drugs. Antioxidant, Antitussive, Antimicrobial are some of the activities produced by the polyherbal formulation. The Antioxidant and Anti-inflammatory syrup are used to treat the acute as well as chronic cough. The survival of Ayurveda medicine is generating a surge of interest. As the risks and shortcoming of modern medicine have become increasingly evident, there has been a shift towards the use of herbal medicine on a global scale. The bulk of Ayurvedic formulations are made from herbs. The syrup is a popular dosage form of cough and medications, easing patient compliance.

INTRODUCTION

Herbal formulations are used for many types of diseases. 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. Herbal formulations mean a dosage form consisting of one more herbs or processed herb in specified quantities to provide specific nutritional and cosmetic benefits meant for use to diagnose, treat and mitigate diseases of the human being. Some herbs have potent ingredients and should be taken with the same level of caution as pharmaceutical medications are based on man - made versions of naturally occurring compounds found in plants. An herbal syrup is prepared by combining with either honey or sugar and sometimes alcohol. Potent herbal plants are used,

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for example ginger, honey, piper longum, tulsi, adulsa, etc. Cough is one of the most common types of coughs mainly there are two types of coughs, which are classified as follows Wet cough Dry cough. It expels secretion from mucous or forges in material from the respiratory tract. An irritation activates nerves that cause your brain to receive a message.

Types of Coughs: -

Coughing serves as an essential protective reflex that helps clear the respiratory tract of irritants, secretions, and foreign particles. Its characteristics may differ depending on the cause and duration. Broadly, coughs can be categorized based on mucus production and clinical presentation into the following types:

Mainly there are two types of coughs, which are classified as follows:

- Wet Cough.
- Dry Cough.
- Acute Cough.
- Chronic Cough.

Wet Cough:

A productive cough involves the expulsion of mucus or phlegm from the respiratory passages. This type of cough plays a beneficial role in clearing accumulated secretions from the lungs and bronchi. It is commonly observed in conditions such as bronchitis, pneumonia, and other respiratory infections. The appearance of the sputum can offer diagnostic insight; for instance, clear or whitish mucus is often linked to viral infections, whereas yellow or green sputum may indicate bacterial involvement. Treatment generally includes maintaining adequate hydration and the use of expectorants to facilitate the loosening and removal of mucus

Dry Cough:

A dry cough is characterized by the absence of sputum production. It is typically associated with irritation or inflammation of the throat or upper respiratory tract. Common causes include viral infections such as the common cold, exposure to environmental irritants like smoke or dust, sudden climatic changes, and allergic conditions. This type of cough often presents with throat discomfort, dryness, and a persistent tickling sensation, which may intensify during nighttime. Since there is no mucus to eliminate, management primarily focuses on reducing irritation and providing symptomatic relief through agents such as antihistamines, cough suppressants, and soothing warm fluids.

Acute Cough:

An acute cough begins abruptly and typically resolves within three weeks. It is most linked to short-term respiratory illnesses such as influenza, sinus infections, or acute bronchitis. External irritants, including dust, pollution, and strong smells- can also trigger sudden coughing. In most cases, it improves on its own, but adequate rest, fluid intake, and basic symptomatic care can help speed up recovery. If the cough continues beyond this period, further medical assessment is recommended to exclude more serious conditions

Chronic Cough:

A cough is considered chronic when it lasts longer than eight weeks in adults. Persistent coughing often indicates an underlying medical issue that requires evaluation. Frequent causes include asthma, chronic obstructive pulmonary disease (COPD), gastroesophageal reflux disease

(GERD), and prolonged tobacco use. It may also result from ongoing throat irritation or the use of certain medications, such as ACE inhibitors. Proper diagnosis may involve imaging studies, pulmonary function tests, and a review of lifestyle factors. Management is primarily directed at treating the underlying cause, which helps reduce both the intensity and frequency of the cough overtime

MATERIAL AND METHOD OF PREPARATION

Material

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

1) Tulsi

2) Fennel

3) Clove

4) Adulsa

5) Turmeric

B) 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.

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Add Lemon grass extract as flavouring agent and methyl paraben: properly as a preservative.

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

COMPARATIVE ANALYSIS WITH SYNTHETIC SYRUPS

Conventional cough formulations, especially those containing codeine, dextromethorphan, or antihistamines, are widely used for rapid symptomatic relief. Despite their effectiveness, frequent or prolonged use of these agents is often linked with undesirable effects such as sedation, gastrointestinal discomfort, nausea, and the risk of tolerance or dependence. Moreover, these medications primarily act by suppressing the cough reflex, without addressing underlying causes such as airway inflammation, irritation, or microbial involvement.

In contrast, polyherbal cough syrups operate through a multi-targeted approach. The medicinal plants incorporated in such formulations contain diverse bioactive constituents that collectively provide soothing effects on the throat, reduce inflammation, facilitate mucus clearance, exhibit antimicrobial activity, and enhance the body's immune defense. This integrated mechanism allows for both symptomatic relief and management of contributing factors.

Studies on established herbal formulations, including products like Himalaya Honitus Cough Syrup and Kofol Herbal Cough Syrup, indicate that polyherbal preparations can deliver comparable—if not superior—efficacy in alleviating cough and mild respiratory symptoms. At the same time, they demonstrate a more favorable safety profile due to the absence of sedative or habit-forming compounds.

Owing to their natural composition and reduced likelihood of adverse effects, polyherbal syrups are particularly suitable for individuals who require repeated or long-term management of cough and related respiratory conditions.

EVALUATION OF SYRUP

The formulated polyherbal syrup was systematically assessed to confirm its quality, stability, and suitability for therapeutic application. Various physicochemical parameters-including color, odor, taste, pH, specific gravity, and stability, were examined, as these attributes provide essential information regarding product consistency and patient acceptability.

1. Color:

Color serves as an important visual indicator of formulation, uniformity and stability. The prepared syrup exhibited a consistent brownish appearance across the batch, attributable to the natural pigments present in herbal extracts such as Tulsi and Turmeric. No evidence of discoloration or sediment formation was observed during storage, indicating good physical stability and proper mixing of components.

2. Oduor:

Oduor evaluation is critical for determining freshness and user acceptance. The formulation demonstrated a characteristic herbal aroma, mainly due to constituents like Tulsi and Ginger. The absence of any foul or rancid smell suggested that the syrup remained free from degradation and microbial contamination. Additionally, the inclusion of peppermint oil imparted a mild, refreshing note that helped balance stronger herbal odors, enhancing overall sensory appeal.

3. Taste:

Taste significantly influences patient compliance, particularly in pediatric use. The syrup possessed a pleasant sweetness derived from the sucrose base, along with a cooling effect from peppermint oil. This combination effectively masked the inherent bitterness of certain herbal ingredients such as Vasaka and Turmeric, resulting in an acceptable and palatable formulation. 4. pH:

The pH of the syrup was determined to evaluate its suitability for oral administration and its stability profile. The observed pH values fell within the acceptable range for herbal liquid formulations, indicating a balanced environment that supports the stability of active constituents while minimizing the risk of irritation and microbial growth.

4. Specific Gravity:

Specific gravity was measured at 25°C to assess the density and uniformity of the formulation. The values obtained were within standard limits for oral syrups, confirming appropriate concentration and consistency. Uniform specific gravity also reflects proper dispersion of ingredients and indicates that the formulation is neither excessively diluted nor overly viscous.

5. Stability Studies:

Stability testing was conducted over a three-month period under accelerated conditions to evaluate the formulation's robustness. The syrup was periodically monitored for changes in appearance, color, odor, and pH. No significant alterations were detected, demonstrating that the formulation remained physically and chemically stable. It retained its original characteristics, including color, texture, and aroma, without any signs of crystallization, phase separation, or microbial growth.

ADVANTAGES OF THE POLYHERBAL COUGH SYRUP

The formulated polyherbal cough syrup presents several benefits compared to conventional synthetic preparations. By incorporating a combination of medicinal plant extracts, it delivers

a broad spectrum of therapeutic effects, where each component contributes distinct pharmacological properties that act together to alleviate cough and support respiratory function.

1. Natural and Well-Tolerated:

This formulation consists entirely of plant-based ingredients such as Vasaka, Tulsi, Ginger, Turmeric, and Liquorice, all of which have been widely used in traditional medicine for their safety and efficacy. In contrast to many synthetic cough formulations that may induce drowsiness or other adverse effects, this herbal preparation is gentle and generally suitable for both adults and children.

2. Multiple Therapeutic Actions:

Each ingredient provides specific benefits that complement one another. Vasaka functions as an expectorant and supports airway dilation, while Tulsi and Turmeric exhibit antiinflammatory and immunomodulatory effects. Liquorice and Peppermint help soothe the throat and reduce irritation. Collectively, these actions target various symptoms such as coughing, mucus accumulation, throat discomfort, and inflammation.

3. Pleasant Taste and Soothing Effect:

The inclusion of peppermint oil and natural sweetening agents such as honey or sucrose enhances the flavor and aroma of the syrup, improving patient compliance—particularly among children. Its smooth consistency also provides a calming effect on the throat, offering quick relief from irritation and persistent coughing.

4. Free from Harmful Additives:

Unlike many commercial syrups that may contain alcohol, artificial coloring agents, or synthetic preservatives, this formulation relies on natural components and safe stabilizing agents like potassium carbonate. This makes it a safer and more environmentally friendly option.

5. Supports Immunity and Respiratory Wellness:

Beyond symptomatic relief, the herbal constituents contribute to strengthening the immune system. Ingredients like Tulsi and Turmeric play a significant role in enhancing the body's defense mechanisms and maintaining respiratory health, thereby reducing susceptibility to recurrent infections and allergic responses.

6. Stability and Cost-Effectiveness:

The formulation demonstrates satisfactory physical and chemical stability under storage conditions, with no significant separation or degradation observed. Additionally, the availability and affordability of the raw materials make it suitable for economical large-scale production.

7. Holistic Therapeutic Approach:

Unlike single-compound formulations that focus on isolated symptoms, this polyherbal preparation addresses multiple underlying factors such as infection, inflammation, and airway irritation. This comprehensive approach promotes overall healing and long-term respiratory health

RESULT: -

The formulated poly-herbal cough syrup showed satisfactory physical parameters such as acceptable pH, viscosity, and stability. The presence of herbal ingredients provided effective expectorant, anti-inflammatory, and soothing action, making it suitable for both dry and wet cough.

CONCLUSION:

The Polyherbal Cough syrup is considered a safe, natural, less side effects and effective alternative to conventional medicines for managing, often with fewer side effects like drowsiness, throat infection. They work by using a blend of botanical extracts with expectorant, antitussive, antioxidant, anti- inflammatory, and soothing properties.

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