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POLYHERBAL SYRUP

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ABSTRACT

Objective and background: The purpose of this study was to develop and assess a polyherbal syrup containing licorice, clove, and adulsa khajure as the active ingredients. These herbs have long been utilized in Ayurveda for their antiviral, antibacterial, anticancer, antioxidant, antibiotic, and antidiabetic properties.[1] **Method:** The syrup is made by extracting the active compounds from these herbs using water, with sugar added as a sweetener and sodium benzoate as a preservative.[1] The study assessed various physicochemical properties, such as pH, viscosity, density, dry residue, and sedimentation characteristics.[1] **Result:** The prepared syrup had a brown color, a rose-like fragrance, and a sweet taste. Its pH, viscosity, dry residue, and density were recorded as 6.48, 90 cp, 69.18%, and 1.38 g/m, respectively.[2] **Conclusion:** The formulated syrup, exhibiting appropriate physicochemical properties, shows potential as a viable candidate for large-scale production, pending further in vivo and clinical studies.[3]

KEYWORDS: Polyherbal; formulation; physicochemical; sedimentation; antioxidant.

INTRODUCTION

Polyherbal syrup is a medicinal preparation made from a combination of multiple herbs, each known for its therapeutic properties. In traditional medicine systems like Ayurveda, polyherbal formulations have been used for centuries due to their synergistic effects, where the combined herbs work together to enhance the overall efficacy of the product.

In Ayurveda, most treatments are taken orally, with a significant number consisting of liquid

preparations derived from single herbs or herbal combinations. In recent times, herbal preparations and plant-based treatments have become widely adopted for addressing a variety of medical conditions. For example, in herbal syrups, ingredients like licorice, clove, adulsa, and khajur are commonly included for their properties, such as antiviral, antibacterial, anticancer, antioxidant, antiasthmatic, and antidiabetic effects. Traditionally, medicinal plants are used in the preparation of these syrups. Herbal formulations are extensively used in both developed and developing nations as a form of health care support.[4]

Advantages of herbal syrup

1. No adverse effects.
2. Safe to use.
3. Easily available.
4. Dosage can be adjusted based on the child's weight.
5. No assistance is needed for administration, allowing the patient to take it independently.
6. Herbs are commonly grown.
7. Has preservative properties by inhibiting the growth of bacteria, fungi, and molds through osmotic pressure.
8. Acts as an antioxidant by slowing down oxidation, as sugar is broken down into cellulose and dextrose.
9. High patient compliance, especially in pediatric patients, due to the sweet taste of syrups.[5]

SYRUP

Syrup is a thick, concentrated, or nearly saturated aqueous solution that contains 66.7% w/w of sugar.

Medicated Syrup: A medicated syrup is a nearly saturated sugar solution in water that contains dissolved medicinal ingredients. It is designed for oral consumption.

Herbal Syrup: Herbal syrup is made by combining a concentrated decoction with honey, sugar, or alcohol. It is also meant for oral use and is considered more potent than other types of syrups.[6]

Types of syrup[5]

1. Flavoured syrup

2. Medicated syrup
3. Artificial syrup

BENEFITS OF HERB-HERB COMBINATION

- ✓ Polyherbal formulations, which combine multiple herbs, offer several benefits compared to using a single herb or allopathic medicine. Because of this, more people around the world are becoming interested in using herbal medicines. The presence of various plant compounds makes polyherbal formulations highly effective in treating many health conditions. Studies suggest that people prefer herbal remedies because they are effective and provide promising treatment results.
- ✓ Polyherbal formulations make treatment more convenient by eliminating the need to take multiple herbal remedies separately. Since combining various herbs in one preparation is easier to use, it also helps improve patient adherence to the treatment.
- ✓ The combination of multiple components helps boost the effect of one ingredient through the action of another. This enhanced effectiveness may not be achieved when the components are used individually.
- ✓ Polyherbal formulations have a broad therapeutic range. They are effective even at lower doses and generally safe at higher doses, making their benefits outweigh potential risks.
- ✓ Herbal combinations with multiple ingredients work on different targets at the same time, providing strong relief. Each type of component acts through a unique mechanism, helping to treat the illness more effectively.
- ✓ Polyherbal preparations are beneficial due to their synergistic effects. They can be used in lower doses to achieve the desired therapeutic effect, reducing the risk of side effects compared to allopathic medicines.
- ✓ Synergism can occur at either the pharmacokinetic or pharmacodynamic level. Pharmacokinetic synergism happens when one herb in the combination enhances the absorption, distribution, metabolism, or elimination of another. Pharmacodynamic synergism occurs when active compounds from different herbs work together on the same physiological system to improve effectiveness.
- ✓ Polyherbal formulations are cost-effective and easily accessible since they come from natural sources. Their global demand has grown, especially in developing countries, due to their affordability and availability.
- ✓ Over 700 herbal formulations, both single-herb and polyherbal, are used in clinical practice in various forms such as decoctions, tinctures, tablets, and capsules, derived from

more than 100 different plants.[6]

✓ Among these, polyherbal syrups are considered more effective and easier to use.

Addition of excipients

- Excipients are non-active components incorporated into pharmaceutical formulations, such as syrups, to support the manufacturing process, enhance stability, improve taste, and assist in drug delivery.[7]

- **Preservatives:** Syrups are typically formulated with preservatives to inhibit microbial growth and extend their shelf life. Some common examples are benzoic acid and parabens.
- **Stabilizers and Thickeners:** These ingredients help maintain the syrup's consistency, prevent ingredient separation, and ensure even distribution of the active components.
- **Flavoring Agent:** Rose oil is used to improve the aroma of the syrup.[7]

Why use herbal syrup over allopathic syrup?

Herbal syrups are made from natural plant ingredients and are traditionally used to relieve cough and support respiratory health. In contrast, allopathic syrups are usually made with synthetic chemicals and focus on treating symptoms rather than the root cause of the disease.

Opting for herbal syrups offers a range of benefits compared to allopathic treatments. Some of the key benefits include:

- **Natural Ingredients:** Herbal syrups are formulated using natural plant extracts, and when prepared correctly, they're generally regarded as safe. They do not contain artificial colors, flavors, or preservatives, which are often found in allopathic syrups.
- **Gentle on the Body:** Unlike allopathic syrups, which may contain strong chemicals that can cause drowsiness, dizziness, or stomach discomfort, herbal syrups are usually milder and easier on the body.
- **Boosts Immunity:** Many herbal syrups include herbal ingredients that help strengthen the immune system and support respiratory health.
- **Fewer Side Effects:** Since herbal syrups are made from natural ingredients, they are less likely to cause side effects, making them a good choice for those sensitive to synthetic medications.[8]

Botanical information of ingredients[9]

Table No. 1: Botanical information of Licorice.

1) Licorice	
Family :	LEGUMINOSAE
Biological Source :	It Consist Of Dried, Peeled, & Unpeeled Roots Of Glycyrrhiza Glabra Linn.
Biological Name :	Glycyrrhiza Glabra
Part Use :	Root
Medicinal Use of Licorice:	1. Used to treat cold and flu. 2. It is a potent healing agent for tuberculosis. 3. It reduces irritation of the throat. 4. Use in relieving stress. 5. It is used in arthritis &rheumatic disease.

Figure: Licorice.

Table No. 2: Botanical information of clove.[9]

1) clove	
Family:	MYRTACEAE
Biological Source :	It Consist Of Dried Flower Bubs Of Eugenia Caryophyllus
Biological Name :	SYZYGIUM AROMATICUM
Part Use :	Flower Bud
Medicinal Use of Clove:	1. It is used as an antiseptic. 2. It is used as a stimulant, carminative. 3. It is used as a flavouring agent. 4. It exhibits strong antimicrobial properties 5. It is used in the treatment of diarrhoea.

Figure: clove.

Table No 3: Botanical information of khajur.[14]

1)khajur	
Family:	ARECACEAE
Biological Source :	Fruits Of The Plant Phoenix Dactylifera
Biological Name :	PHOENIX DACTYLIFERA
Part Use :	Fruit
Medicinal Use of Khajur:	1. It is Used To Maintain Blood Sugar levels. 2. It Used To Improve Diagnoses. 3. Weight Management. 4. Act As Natural Sweetness. 5. Good For Skin.
Chemical constituent:	Khajur Contain Carbohydrates, Protein, Fiber, and Minerals.

Table No. 4: Botanical information of adulsa.[14]

1) adulsa	
Family:	ACANTHACEAE
Biological Source :	The Leaves Of Adhatodavasica
Biological Name :	ADHOTADA VASICA
Part Use :	leaves
Medicinal Use of Adulsa:	1. It is used in the treatment of asthma. 2. It is used in the treatment of cough. 3. It is used in the treatment of bronchitis. 4. used as antitussive.
Chemical constituent :	Adulsa contains alkaloids, vasicine, tannins, saponins, and flavonoids.

MATERIAL AND METHOD[12]

Material

Liquorice, clove, khajur, adulsa, sugar, sodium benzoate, distilled water.

Method for the preparation of herbal syrup

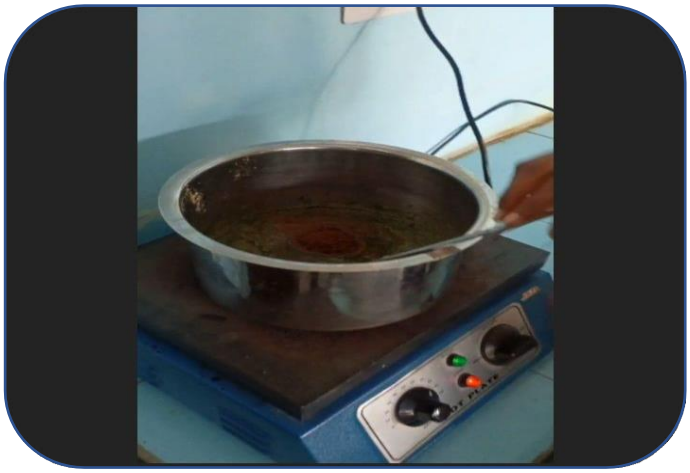
1. Preparation of drug powder

Approximately 10g of each dried crude drug (clove, liquorice, adulsa) was measured and finely powdered using a mortar and pestle. Each drug was ground separately, collected in individual containers, and weighed to ensure they met the required quantity. The weight of clove, liquorice, and adulsa was maintained at 30g.[12]

2. Preparation of decoction

Firstly, approximately 10g Of Fresh Liquorice, Adulsa, Clove Powder, 60g of Khajur. They were Then Placed In A Beaker And Soaked In 400- 500 mL Of Distilled Water. This Mixture Was Left Undisturbed For Around 4-5 Hours. After This Period, It Was Boiled At (60°C) for

40 min on a Hot Plate Until The Water Volume Reduced To Nearly Half Of The Original Amount, approximately 250ml. The Resulting Extract Was Then Filtered Using A Muslin Cloth And Properly Stored.[12]

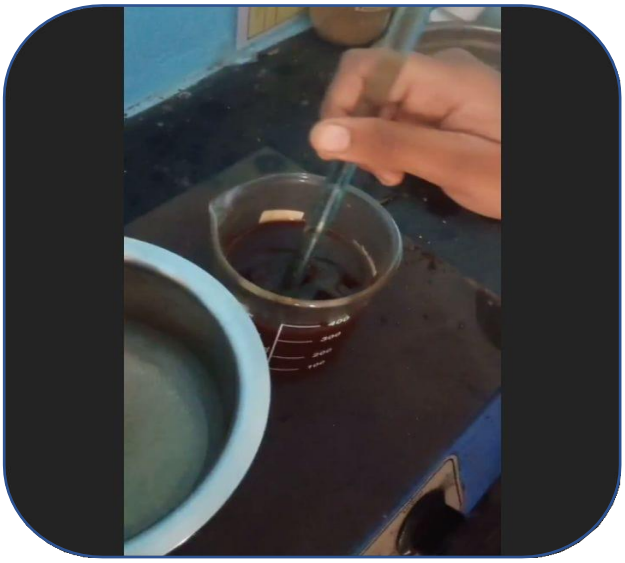


3. Preparation of simple syrup

The simple syrup (65.67% w/v) was prepared according to the standards outlined in the Indian Pharmacopoeia. 50g of sugar was weighed and added to 50 mL of water. This was heated with occasional stirring until the sugar dissolved.[13]

4. Preparation of final polyherbal syrup

To prepare the final herbal syrup, take a beaker and add the decoction solution and simple syrup. Mix well and heat at 60°C for 40 minutes. After that, add the preservative. The final herbal syrup formulation was completed and then subjected to a series of standardized evaluation tests.[5]



- **EVALUATION TEST FOR THE POLY HERBAL SYRUP**

1. Physicochemical Parameters Of Syrup[12]

The herbal syrup was assessed based on various physicochemical properties, including its physical characteristics (color, odor, and taste), as well as pH, density, and specific gravity.[8]

2. Colour Examination

A 5 mL sample of the final syrup was placed on a watch glass and examined under a white tube light against a white background. The color of the syrup was visually examined without the aid of instruments.[12]

3. Odour Examination

A 2 mL sample of the final syrup was individually smelled, with a 2-minute interval between each evaluation to eliminate any influence from the previous scent.[12]

4. Test Examination

A small amount of the final syrup was placed on the tip of the tongue to evaluate its taste using the taste buds.[12]

5. Determination of PH

An accurately measured 10 mL of the final syrup was transferred into a 100 mL volumetric flask, diluted to volume with distilled water, sonicated for approximately 10 minutes, and its pH determined using a digital pH meter.[12]

6. Specific Gravity At 25°C

The syrup's density was determined using the density bottle method by measuring its mass and volume. The average density obtained through this method was 1.38 g/mL.[12]

7. Determining The Viscosity

The viscosity was measured by placing 50 mL of the syrup in a Brookfield viscometer using Spindle No. 64 at a speed of 100 rpm at room temperature, with readings taken three times. The determined viscosity of the syrup was 90 cp.[3]

8. Crystallization Evaluation

Three syrup bottles were kept in a fridge at 4°C for 14 days and then checked for any crystal formation.[3]

9. Caps Locking

Three 100 mL syrup bottles were stored upside down at room temperature for a week. The opening mechanism was then tested, and cap locking was considered successful if the cap was difficult to open.[3]

10. Dry Residue

A 5 mL sample of the syrup was dried at 110 °C for two hours, cooled in a desiccator, and

then weighed. The process was repeated until a constant weight was obtained, and the dry residue was calculated. This procedure was conducted three times.[3]

Figure: Hot Air Oven.

11. Sedimentation

Three samples were centrifuged at 3500 rpm for 15 minutes, and the sedimentation was assessed.[3]

Table 1: Result of Physicochemical Parameters of Developed Poly Herbal Syrup.

Sr.no	Physicochemical parameters	Observed Values	Ideal value
1	crystallization:	No crystallization occurs	Homogeneous mixture.
2	Cap locking:	The cap cannot be easily opened.	_
3	Colour:	Brown	_
4	Odure:	Rose	_
5	Dry recedue:	69.18%	60-80 %
6	PH:	6.48	-
7	Sedimentation:	No sedimentation occurs.	Ideal syrup
8	Density:	1.38g/ml	1.20-1.40g/ml
9	viscosity:	90cp	5000-50000cp

CONCLUSION

Various research studies have been conducted to assess the pharmacological effects of polyherbal syrups. The findings suggest that these formulations offer therapeutic benefits at lower doses while exhibiting fewer side effects compared to allopathic medicines. The combination of multiple herbs in polyherbal formulations provides significant advantages over single-herb remedies and conventional drugs. Due to the synergistic effect of herbal components, these formulations can achieve the desired therapeutic outcomes with reduced dosages. This, in turn, minimizes the risk of adverse effects commonly associated with allopathic treatments.

According to the present study, it was concluded that the prepared polyherbal syrup shows good physical characteristics. The syrup is well-tolerated, making it especially helpful for patients.

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