



Research Article

Formulation and Evaluation of Herbal Lozenges

Manoj Chincholikar*, Prachi Rahangdale, Pradhuman Patel, Prince Kushwaha, Pulkit Prajapati, Rahul Bisen, Rajesh Kumar Yadav, Jagdish Chandra Rathi

NRI Institute of Pharmaceutical Science, Bhopal M. P.

Herbal lozenges are medicated solid preparations intended to dissolve slowly in the mouth, releasing active herbal ingredients for local action in the throat. The present study focuses on the formulation and evaluation of herbal lozenges using natural ingredients such as ginger, tulsi, and honey. These ingredients possess antimicrobial, anti-inflammatory, and soothing properties. The prepared lozenges were evaluated for physical characteristics, hardness, friability, weight variation, and dissolution time. The study concluded that herbal lozenges can be effectively formulated with desirable properties and can serve as a safe alternative to synthetic throat medications. The results show that the herbal lozenges had good physical properties, tasted acceptable, and had enough strength. The dissolution time fell within the desired range, allowing for lasting effects in the mouth. Stability tests showed that the formulation stayed stable without significant changes in quality. The lozenges were prepared using the heating and congealing method, ensuring uniform mixing and proper consistency. Various evaluation parameters were assessed, including organoleptic properties (color, taste, odor), physical characteristics (hardness, friability, weight variation), and in vitro dissolution time. Stability studies were also conducted under different environmental conditions to determine the shelf life of the formulation. In conclusion, the herbal lozenges we developed offer an effective, safe, and cost-effective alternative to regular synthetic lozenges. This study showcases the potential of herbal formulations in today's pharmaceutical field and supports their use for treating throat-related issues.

Keywords: Herbal lozenges, heating, congealing method, throat, quality.

INTRODUCTION

Herbal medicines have been used since ancient times to treat and prevent various diseases. In recent years, more people have turned to herbal products because they are safe, effective, and have fewer side effects compared to synthetic drugs. Among different herbal forms, herbal lozenges have gained popularity since they offer a simple way to deliver herbal ingredients directly to the throat and mouth. Lozenges are solid medicated forms designed to dissolve slowly in the mouth. They are generally made with a sweet base, like sucrose or sugar, and may include one or more active ingredients. The slow dissolution allows the active ingredients to stay in contact with the throat tissues longer, which improves their therapeutic effect. Lozenges are commonly used to treat sore throats, coughs, throat irritation, and minor oral

infections. The use of herbal ingredients in lozenges has grown due to increased awareness of natural and traditional medicine. Ingredients like ginger (*Zingiber officinale*), tulsi (*Ocimum sanctum*), and honey are well-known for their health benefits. Ginger has strong anti-inflammatory and antimicrobial properties that help reduce throat pain and infection. Tulsi is recognized for its immune-boosting and antibacterial effects, while honey serves as a natural soothing agent that eases throat irritation. Herbal lozenges provide several advantages over conventional synthetic lozenges. They are safer for long-term use, easily accessible, affordable, and suitable for people of different ages. Moreover, herbal lozenges are simple to prepare and can be made from natural materials without the need for complex equipment. These

benefits make herbal lozenges a promising alternative to synthetic throat medications. 3 This study focuses on creating and evaluating herbal lozenges using selected herbal ingredients. The prepared lozenges are assessed based on various factors like physical characteristics, hardness, weight variation, friability, and dissolution time. The goal of the study is to develop a safe, effective, and stable herbal lozenge formulation for treating throat-related issues. Herbal lozenges are made with plant-based ingredients that have medicinal qualities. Herbs like ginger (*Zingiber officinale*), tulsi (*Ocimum sanctum*), licorice (*Glycyrrhiza glabra*), and honey are often included in throat remedies due to their antimicrobial, anti-inflammatory, antioxidant, and soothing properties. These natural ingredients help reduce throat irritation, suppress coughs, and promote the healing of inflamed tissues. Many people prefer herbal lozenges because they are natural and usually well tolerated. NR 4 Making herbal lozenges involves choosing the right herbal extracts, sweeteners, binders, and flavorings to create a stable and tasty product. Various methods can be used to make lozenges, including the heating and congealing method or direct compression. Proper formulation is important to ensure even distribution of active ingredients, the right hardness, and controlled dissolution time. Evaluating herbal lozenges is crucial to determine their quality, safety, and effectiveness. Several factors such as weight variation, hardness, friability, thickness, dissolution time, and sensory properties are checked during evaluation. Stability studies help identify the shelf life and storage conditions of the finished product. These evaluations ensure that the lozenges meet pharmaceutical standards and provide the intended therapeutic effect. The growing interest in herbal products has prompted researchers and pharmaceutical companies to create new herbal formulations. Herbal lozenges offer a promising way to merge traditional herbal knowledge with modern pharmaceutical methods. They not only provide relief from symptoms but also increase patient compliance because of their appealing taste and ease of use. This study focuses on the formulation and evaluation of herbal lozenges made from selected medicinal herbs. The goal of this research is to develop an effective, stable, and acceptable herbal lozenge formulation for managing throat-related issues such as coughs, irritation, and mild infections.

MATERIAL AND METHODS

The following materials were used for the formulation of herbal lozenges:

Active Ingredients

Ginger extract (*Zingiber officinale*) - Anti-inflammatory and antimicrobial agent

Tulsi extract (*Ocimum sanctum*) - Immunomodulatory and antibacterial agent

Honey - Natural demulcent and soothing agent

Excipients

Sucrose (Sugar base) - Provides structure and sweetness

Liquid glucose - Prevents crystallization and improves texture

Menthol - Provides cooling and soothing effect

Citric acid - Enhances taste and acts as preservative

Flavoring agents - Improves palatability (e.g., orange or lemon flavor)

Coloring agents (optional) - Improves appearance

Equipment Used: Heating mantle or hot plate
Stainless steel vessel
Thermometer
Stirrer or glass rod
Molds (lozenge molds)

Weighing balance
Desiccators

Method of Preparation

The herbal lozenges were prepared by the heating and congealing method, which is commonly used for hard lozenges.

Procedure

1. Weighing of Ingredients: All ingredients were accurately weighed using a digital weighing balance.
2. Preparation of Sugar Base: Sucrose and liquid glucose were taken in a stainless-steel vessel and heated gently until a clear syrup was formed.

3. **Heating Process:** The mixture was heated to a temperature of about 140- 150°C until it reached the hard crack stage.

4. **Addition of Herbal Extracts:** The vessel was removed from heat, and ginger extract, tulsi extract, and honey were added with continuous stirring.

5. **Incorporation of Additives:** Menthol, citric acid, and flavoring agents were added to the mixture and mixed thoroughly.

6. **Molding:** The prepared mass was poured into pre-lubricated molds.

7. **Cooling and Solidification:** The molds were allowed to cool at room temperature until the lozenges solidified.

8. **Packaging:** The prepared lozenges were removed from molds and stored in airtight containers to prevent moisture absorption.

Formulation Table (Example)

Ingredient	Quantity (%)
Ginger extract	2-5%
Tulsi extract	2-5%
Honey	5-10%
Sucrose	60-70%
Liquid glucose	10-15%
Menthol	0.5-1%
Citric acid	1-2%
Flavor	q.s.

Evaluation of Herbal Lozenges

Organoleptic Evaluation: Color Taste Odor Appearance

Weight Variation Test 20 lozenges were weighed individually and the average weight was calculated.

Hardness Measured using a hardness tester to determine mechanical strength.

Friability Test Performed using a friabilator to assess resistance to breakage (acceptable limit:

Thickness Measured using vernier calipers.

Dissolution Test The time required for the lozenge to dissolve completely in the mouth was noted (ideal: 10-15 minutes).

pH Determination The pH of the solution was measured using a pH meter. 15 4.5

Stability Studies Stability studies were conducted to evaluate the effect of environmental conditions on the formulation. Conditions: Room temperature Elevated temperature (40°C ± 2°C) Humidity conditions Parameters Evaluated: Physical appearance Hardness

Taste Dissolution time RMACY the lozenges were observed over a period of 1–3 months.

Moisture Content Moisture content affects stability and shelf life. Method: Loss on drying method Significance: Prevents microbial growth Maintains texture

In-vitro Drug Release Study (Optional Advanced Test) This test evaluates the rate at which active ingredients are released. Significance: Determines efficiency of formulation Helps in optimization

RESULT AND DISCUSSION:

The formulated herbal lozenges were evaluated for various parameters, and the results obtained are presented below.

1. Organoleptic Properties

Color: Light brown

Odor: Pleasant

Taste: Sweet with mild pungency

Texture: Smooth and uniform

2. Weight Variation

Lozenge No.	Weight (g)
1	2.01
2	2.03
3	2.00
4	2.02
5	2.01

Average Weight = 2.01

3. Thickness

Sample No.	Thickness (mm)
L1	4.1
L2	4.0
L3	4.2

Average Thickness = 4.1 mm

SUMMARY AND CONCLUSION:

The present study was successfully carried out to formulate and evaluate herbal lozenges using natural ingredients such as ginger, tulsi, and honey. The objective of developing a safe, effective, and patient-friendly dosage form for the treatment of throat-related ailments was achieved. The formulated lozenges were prepared using the heating and congealing method, which proved to be simple, economical, and suitable for producing uniform and stable lozenges. The selected herbal ingredients contributed significantly to the therapeutic effectiveness of the formulation due to their antimicrobial, anti-inflammatory, and soothing properties. Evaluation of the prepared lozenges showed satisfactory results in terms of organoleptic properties, weight variation, hardness, friability, thickness, and dissolution time. The lozenges exhibited adequate mechanical strength, low friability, and uniformity, indicating good quality and consistency. The dissolution time was within the ideal range, ensuring prolonged action in the oral cavity and enhanced therapeutic effect. The pH of the formulation was found to be suitable for oral use, and stability studies confirmed that the lozenges remained stable under normal storage conditions without significant changes in their properties. These findings indicate that the formulated herbal lozenges are reliable and effective. The study confirms that herbal lozenges are an effective alternative to conventional

synthetic lozenges for the management of throat-related disorders such as cough, sore throat, and irritation. They offer advantages such as improved patient compliance, minimal side effects, and ease of administration. Overall, the study demonstrates that herbal lozenges can serve as a promising alternative to conventional synthetic lozenges. They offer the advantages of safety, cost-effectiveness, and better patient acceptability. The incorporation of herbal ingredients not only enhances therapeutic efficacy but also supports the growing demand for natural and eco-friendly healthcare products. The lozenges were prepared using the heating and congealing method, which proved to be simple, economical, and suitable for large-scale production. The prepared formulations showed satisfactory results in terms of organoleptic properties, weight uniformity, hardness, friability, and dissolution characteristics. The stability studies indicated that the herbal lozenges remained stable under normal storage conditions without significant changes in their physical and chemical properties. Thus, it can be concluded that the formulated herbal lozenges are suitable for the management of throat irritation, cough, and related conditions, and have potential for further development and commercial application.

REFERENCES

1. Indian Pharmacopoeia Commission. Indian Pharmacopoeia. Ghaziabad: IPC;2018.
2. Allen LV, Popovich NG, Ansel HC. Ansel's Pharmaceutical Dosage Forms and Drug Delivery

- Systems. 10th ed. Lippincott Williams & Wilkins; 2014.
3. Aulton ME. Aulton's Pharmaceutics: The Design and Manufacture of Medicines. 5th ed. Elsevier; 2018.
 4. Remington JP. Remington: The Science and Practice of Pharmacy. 22nd ed. Pharmaceutical Press; 2013.
 5. Kokate CK, Purohit AP, Gokhale SB. Pharmacognosy. 55th ed. Nirali Prakashan; 2016.
 6. World Health Organization. WHO Guidelines on Good Agricultural and Collection Practices (GACP) for Medicinal Plants. Geneva: WHO; 2003.
 7. World Health Organization. WHO Guidelines on Quality Control Methods for Herbal Materials. Geneva: WHO; 2011.
 8. Trease GE, Evans WC. Pharmacognosy. 16th ed. Saunders Elsevier; 2009.
 9. Bentley R, Driver S. Textbook of Pharmaceutics. Oxford University Press; 2009.30
 10. Lachman L, Lieberman HA, Kanig JL. The Theory and Practice of Industrial Pharmacy. 3rd ed. CBS Publishers; 2009.
 11. British Pharmacopoeia Commission. British Pharmacopoeia. London; 2019.
 12. Sharma PP. Cosmetics - Formulation, Manufacturing and Quality Control. Vandana Publications; 2010.
 13. Cooper JW, Gunn C. Dispensing for Pharmaceutical Students. CBS Publishers; 2012.
 14. Banker GS, Rhodes CT. Modern Pharmaceutics. 4th ed. Marcel Dekker; 2002.
 15. Liberman HA, Lachman L. Pharmaceutical Dosage Forms: Tablets. Vol. 1-3. Marcel Dekker; 2010.
 16. Khandelwal KR. Practical Pharmacognosy. 23rd ed. Nirali Prakashan; 2015.
 17. Harborne JB. Phytochemical Methods. 3rd ed. Springer; 2005.

Cite: Manoj Chincholikar*, Prachi Rahangdale, Pradhuman Patel, Prince Kushwaha, Pulkit Prajapati, Rahul Bisen, Rajesh Kumar Yadav, Jagdish Chandra Rathi, Formulation and Evaluation of Herbal Lozenges, And Future Perspectives, *Int. J. Med. Pharm. Sci.*, 2026, 2 (8), 65-69. <https://doi.org/10.5281/zenodo.21745131>