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## FORMULATION AND EVALUATION OF HERBAL LIQUID MOUTH FRESHENER.

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### I. ABSTRACT

Maintaining good oral hygiene is important for overall health and well-being. One common oral health concern is halitosis (bad breath), which occurs due to the activity of microorganisms present in the oral cavity. Many commercial mouth fresheners and oral care products are used to reduce bad breath; however, these products often contain synthetic additives that may cause side effects such as dry mouth, irritation of oral tissues, and altered taste sensation when used for prolonged periods. As a result, herbal oral care products have gained popularity because they are considered safer, cost-effective, and derived from natural sources.

The present study focused on the formulation and evaluation of a herbal liquid mouth freshener using natural ingredients. The formulation consisted of peppermint oil, clove oil, menthol, cardamom extract, fennel extract, honey, stevia, sodium benzoate, and purified water. The preparation involved the separate mixing of aqueous and oil phases, incorporation of herbal extracts, homogenization, and final packaging.

The developed formulation was evaluated for various parameters, including organoleptic properties, pH, viscosity, and physical stability. The mouth freshener exhibited a pleasant minty aroma, a sweet and cooling taste, good clarity, and easy dispensing characteristics. The pH of the formulation was found to be 5.89, indicating its suitability for oral use. Additionally, the product showed acceptable viscosity and remained physically stable without any phase separation throughout the study period. These findings suggest that the formulated herbal liquid mouth freshener can effectively support oral hygiene and help reduce bad breath while offering the benefits of natural ingredients.

**KEYWORDS:** Herbal liquid mouth freshener, Oral hygiene, Halitosis, Herbal formulation, Peppermint oil, Clove oil, Menthol, Cardamom extract, Fennel extract, Natural oral care, Physicochemical evaluation, Herbal oral healthcare.

### II. INTRODUCTION

Oral health plays a vital role in maintaining overall health and quality of life. A healthy oral cavity, including the teeth, gums, tongue, taste buds, and surrounding tissues, is essential for performing everyday functions such as eating, speaking, swallowing, and social interaction comfortably. Poor oral hygiene can lead to several oral health problems, including dental plaque, tooth decay, gingivitis, periodontal diseases, and halitosis (bad breath).

Halitosis is one of the most common oral conditions and is mainly caused by the growth of microorganisms and the accumulation of food particles within the mouth. This condition can negatively affect an individual's confidence and social interactions. Mouth fresheners are commonly used to reduce unpleasant breath odor and provide a feeling of freshness. However, many commercial products contain synthetic ingredients that may cause unwanted side effects with long-term use.

In recent years, herbal mouth fresheners have gained popularity due to their natural origin, safety, affordability, and eco-friendly nature. These formulations utilize plant-based ingredients that offer multiple therapeutic benefits. The present herbal liquid mouth freshener contains peppermint oil, clove oil, menthol, cardamom extract, fennel extract, honey, stevia, sodium benzoate, and purified water.

Peppermint oil provides a refreshing aroma and cooling sensation, while clove oil contains eugenol, a bioactive compound known for its antimicrobial, antiseptic, and

analgesic properties. Menthol enhances the cooling effect and contributes to long-lasting freshness. Cardamom and fennel have traditionally been used as natural breath fresheners because of their aromatic volatile oils. Honey acts as a natural sweetening and soothing agent, whereas stevia provides sweetness without increasing sugar content. Sodium benzoate is incorporated as a preservative to improve the stability and shelf life of the formulation.

The objective of this study was to formulate and evaluate a herbal liquid mouth freshener using selected natural ingredients. The formulation was assessed for its physicochemical properties and overall stability. The developed product is intended to mask unpleasant oral odors, provide a refreshing sensation, and support the maintenance of good oral hygiene through the beneficial effects of herbal ingredients.

### III. MATERIALS AND METHODS

#### A. STUDY DESIGN

The present study was designed as an experimental formulation and evaluation study to develop a herbal liquid mouth freshener using natural ingredients. The main objective was to prepare a safe, effective, and stable mouth freshener capable of reducing bad breath and promoting oral hygiene.

The study was carried out in several stages. Initially, a detailed review of relevant literature was conducted to understand the causes of halitosis, the role of herbal ingredients in oral care, and the formulation requirements for liquid mouth fresheners. Based on the literature survey, suitable herbal ingredients such as peppermint oil, clove oil, menthol, cardamom extract, fennel extract, honey, stevia, sodium benzoate, and purified water were selected.

The formulation was prepared by separately mixing the aqueous phase and oil phase, followed by the incorporation of herbal extracts and other ingredients. The mixture was then homogenized to obtain a uniform and stable preparation. After formulation, the product was transferred into suitable containers for storage and evaluation.

The prepared herbal mouth freshener was evaluated for various quality parameters, including appearance, color, odor, taste, clarity, pH, viscosity, and physical stability. These tests were performed to determine the acceptability, safety, and stability of the formulation for oral use.

The collected observations and evaluation results were analyzed to assess the overall quality and performance of the herbal mouth freshener. The study aimed to demonstrate that herbal ingredients can be effectively utilized in oral care products to provide freshness, reduce unpleasant breath odor, and support oral health while minimizing the side effects commonly associated with synthetic formulations.

### IV. INCLUSION CRITERIA

The following criteria were considered during the formulation and evaluation of the herbal liquid mouth freshener:

1. Herbal ingredients selected for the formulation should be obtained from reliable and authenticated sources.
2. Ingredients must possess properties that support oral hygiene, such as antimicrobial, antiseptic, antioxidant, breath-freshening, or soothing effects.
3. All raw materials should meet acceptable quality standards and be suitable for oral use.
4. The selected ingredients should be compatible with one another and capable of forming a stable liquid formulation.
5. The formulation should have acceptable organoleptic characteristics, including pleasant taste, aroma, appearance, and clarity.
6. The prepared mouth freshener should maintain physical stability without visible phase separation, precipitation, or discoloration during the observation period.
7. The pH of the formulation should remain within a range suitable for use in the oral cavity.
8. Only formulations prepared using safe, non-toxic, and naturally derived ingredients were included in the study.

### V. EXCLUSION CRITERIA

The following criteria were considered for excluding materials or formulations from the study:

1. Ingredients with doubtful quality, contamination, or expired shelf life were excluded from the formulation process.
2. Raw materials that were not suitable for oral use or lacked adequate safety information were not included in the study.
3. Ingredients showing incompatibility with other formulation components, resulting in instability or undesirable reactions, were excluded.
4. Formulations exhibiting phase separation, precipitation, discoloration, or any significant physical instability during evaluation were rejected.
5. Preparations with an unpleasant odor, unacceptable taste, or poor appearance were excluded from further analysis.
6. Formulations having a pH outside the acceptable range for oral use were not considered suitable for the study.
7. Any formulation showing microbial contamination or signs of spoilage during storage was excluded from evaluation.

8. Preparations that failed to meet the required quality, stability, or performance parameters were not included in the final assessment.

## VI. FORMULATION

### INGREDIENTS

- Carrot Seed Oil
- Aloe Vera Gel
- Turmeric Extract
- Beeswax
- Stearic Acid
- Cetyl Alcohol
- Glycerin
- Vitamin E
- Methyl Paraben
- Propyl Paraben
- Rose Water
- Distilled Water

### VII . CATEGORY/USE

- Natural sunscreen agent, antioxidant
- Moisturizer, soothing agent
- Antioxidant, anti-inflammatory
- Thickening agent
- Emulsifying agent
- Stabilizer, emollient
- Humectant
- Antioxidant, preservative enhancer
- Preservative
- Preservative
- Fragrance, soothing agent
- Vehicle/Base

### VIII. FORMULATION OF HERBAL LIQUID MOUTH FRESHENER

The herbal liquid mouth freshener was formulated using natural ingredients known for their breath-freshening and oral care properties. Peppermint oil and menthol were incorporated to provide a pleasant cooling sensation and refreshing aroma. Clove oil was included for its antimicrobial and antiseptic activities, while cardamom and fennel extracts were added to enhance flavor and help reduce unpleasant breath odor. Honey and stevia were used as natural sweetening agents to improve palatability. Sodium benzoate served as a preservative to maintain product stability, and purified water was used as the vehicle for the formulation.

The formulation was prepared by first dissolving the water-soluble ingredients in a measured quantity of purified water. In a separate container, the oil-soluble ingredients were mixed thoroughly to obtain a uniform blend. The oil phase was then slowly added to the aqueous phase with continuous stirring to ensure proper mixing. Cardamom and fennel extracts were incorporated

gradually, followed by the addition of honey and stevia. The mixture was stirred continuously until a clear and homogeneous solution was obtained.

The prepared mouth freshener was then filtered, if required, to remove any undissolved particles and transferred into clean, airtight containers. The final product was stored under suitable conditions and subjected to further evaluation for its physicochemical properties, stability, and overall quality.

The developed herbal liquid mouth freshener was designed to provide a refreshing effect, mask unpleasant oral odors, and support oral hygiene through the beneficial properties of its natural ingredients.

### IX . ETHICAL CONSIDERATIONS

The present study was conducted with due consideration for ethical principles and laboratory safety practices. Since the study involved the formulation and evaluation of a herbal liquid mouth freshener and did not include any clinical testing on human participants or animals, no direct ethical risk was associated with the research.

All ingredients used in the formulation were obtained from reliable sources and selected based on their established safety and suitability for oral care applications. Standard laboratory procedures were followed during the preparation, handling, storage, and evaluation of the formulation to ensure the quality and safety of the product.

The study was carried out solely for academic and research purposes. Care was taken to record observations accurately and present the results honestly without fabrication, manipulation, or misrepresentation of data. All information used in the study was appropriately reviewed and interpreted in accordance with accepted scientific and research practices.

The research aimed to develop a safe and effective herbal mouth freshener while maintaining integrity, transparency, and responsibility throughout the study process.

### X . RESULT

The herbal liquid mouth freshener was successfully formulated using selected natural ingredients, including peppermint oil, clove oil, menthol, cardamom extract, fennel extract, honey, stevia, sodium benzoate, and purified water. The prepared formulation was evaluated for various physicochemical parameters to determine its quality, stability, and suitability for oral use.

The formulation appeared clear and homogeneous, with no visible particles or phase separation. It possessed a pleasant minty aroma and a sweet, cooling taste, making it acceptable for use as a mouth freshener. The product was easy to dispense and showed good overall appearance.

The pH of the formulation was found to be 5.89, which is considered suitable for use in the oral cavity. The viscosity of the mouth freshener was satisfactory, allowing convenient use while maintaining good consistency. During the observation period, the formulation remained physically stable and showed no signs of precipitation, discoloration, or separation of ingredients.

The evaluation results indicate that the formulated herbal mouth freshener possesses desirable organoleptic properties, acceptable physicochemical characteristics, and good stability. These findings suggest that the formulation can effectively provide a refreshing sensation, help reduce unpleasant breath odor, and support oral hygiene through the use of natural ingredients.

### 1) Peppermint Oil:



Fig. peppermint oil

Clove oil is widely recognized for its therapeutic value in dentistry. Eugenol, the major constituent of clove oil, possesses antimicrobial, analgesic, antiseptic, and anti-inflammatory properties. Numerous studies have supported its use in oral care formulations.

### 2) Clove Oil:



Fig. Clove Oil

Cardamom and fennel have traditionally been used as natural breath fresheners. Their volatile oils produce pleasant aroma and deodorizing effects. Research findings suggest that these herbs contribute significantly to oral freshness and improved mouthfeel.



Honey has gained considerable attention as a natural sweetener and antimicrobial agent. Scientific investigations have reported that honey inhibits microbial growth through osmotic action and the production of antimicrobial compounds.



Fig. Honey

Stevia has emerged as an important natural sweetener in pharmaceutical and food formulations. Unlike conventional sugars, stevia provides sweetness without increasing caloric content and is considered suitable for diabetic individuals.



Herbal ingredients possess significant potential for oral healthcare applications. The combined use of peppermint oil, clove oil, menthol, fennel extract, cardamom extract, honey, and stevia may provide refreshing, antimicrobial, deodorizing, and patient-friendly effects. Therefore, the present study was undertaken to formulate and evaluate a herbal liquid mouth freshener as a natural alternative to synthetic oral freshening products.

## XI .DISCUSSION

The present study focused on the formulation and evaluation of a herbal liquid mouth freshener prepared using natural ingredients known for their beneficial effects on oral health. The objective was to develop a stable,

effective, and user-friendly formulation that could help reduce bad breath and promote oral hygiene.

The selected ingredients were chosen based on their traditional use and reported therapeutic properties. Peppermint oil and menthol provided a pleasant cooling sensation and refreshing aroma, while clove oil contributed antimicrobial and antiseptic effects due to the presence of eugenol. Cardamom and fennel extracts enhanced the flavor of the formulation and acted as natural breath-freshening agents. Honey and stevia improved the taste and acceptability of the product without the need for excessive sugar. Sodium benzoate was included as a preservative to maintain the stability and quality of the formulation during storage.

The prepared mouth freshener showed desirable organoleptic characteristics, including a clear appearance, pleasant minty odor, and sweet cooling taste. These properties are important because they influence user acceptance and regular use of the product. The pH of the formulation was found to be 5.89, which is suitable for oral application and unlikely to cause irritation when used appropriately.

The viscosity of the formulation was satisfactory, allowing easy dispensing and comfortable use. During the stability evaluation, no phase separation, precipitation, or noticeable changes in appearance were observed, indicating good physical stability of the formulation. This suggests that the selected ingredients were compatible and capable of forming a uniform preparation.

Overall, the study demonstrated that a herbal liquid mouth freshener can be successfully formulated using natural ingredients. The formulation exhibited acceptable quality characteristics and may serve as a natural alternative to conventional mouth fresheners. The results support the potential use of herbal ingredients in oral care products for improving breath freshness and maintaining oral hygiene.

## XII. CONCLUSION

The present study successfully developed and evaluated a herbal liquid mouth freshener using natural ingredients such as peppermint oil, clove oil, menthol, cardamom extract, fennel extract, honey, stevia, sodium benzoate, and purified water. The formulation was designed to provide a refreshing effect, reduce unpleasant breath odor, and support oral hygiene through the beneficial properties of herbal ingredients.

The prepared mouth freshener showed satisfactory physicochemical characteristics, including a pleasant aroma, sweet cooling taste, good clarity, suitable pH, acceptable viscosity, and physical stability throughout the evaluation period. No signs of phase separation,

precipitation, or discoloration were observed, indicating the stability of the formulation.

The findings of this study suggest that herbal ingredients can be effectively incorporated into oral care products as a safe and natural alternative to conventional mouth fresheners. The formulated herbal liquid mouth freshener demonstrated good quality, stability, and user acceptability, making it a promising option for maintaining oral freshness and promoting oral hygiene. Further studies may be conducted to evaluate its long-term effectiveness and antimicrobial activity on a larger scale.

## XIII. REFERENCES

### REFERENCES

1. Kokate CK, Purohit AP, Gokhale SB. *Pharmacognosy*. 56th ed. Pune: Nirali Prakashan; 2021.
2. Khandelwal KR. *Practical Pharmacognosy: Techniques and Experiments*. 30th ed. Pune: Nirali Prakashan; 2019.
3. Trease GE, Evans WC. *Trease and Evans Pharmacognosy*. 16th ed. London: Elsevier; 2009.
4. Indian Pharmacopoeia Commission. *Indian Pharmacopoeia*. Ghaziabad: Indian Pharmacopoeia Commission; 2022.
5. World Health Organization. *WHO Guidelines on Good Herbal Processing Practices for Herbal Medicines*. Geneva: World Health Organization; 2018.
6. Newman MG, Takei HH, Klokkevold PR, Carranza FA. *Carranza's Clinical Periodontology*. 13th ed. St. Louis: Elsevier; 2019.
7. Gupta P, Gupta N, Singh HP. Herbal approaches in oral healthcare: A review. *International Journal of Pharmaceutical Sciences and Research*. 2020;11(4):1500–1508.
8. Prasanth M. Antimicrobial and therapeutic properties of clove in oral healthcare. *Journal of Pharmacy Research*. 2018;12(3):245–250.
9. Bhowmik D, Kumar KPS, Yadav A, Srivastava S, Paswan S. Herbal remedies and their role in oral hygiene: A review. *The Pharma Innovation Journal*. 2019;8(5):120–126.
10. Rang HP, Ritter JM, Flower RJ, Henderson G. *Rang and Dale's Pharmacology*. 10th ed. London: Elsevier; 2023.