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Comparative Study of Formulated Herbal Lozenges and AYURTUSS Lozenges

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Abstract: Lozenges are a type of solid dosage form designed to dissolve slowly in the mouth, offering localized therapeutic effects. Cough is a prevalent symptom associated with various respiratory illnesses, often affecting an individual's daily comfort and quality of life. Many over-the-counter cough remedies contain synthetic ingredients, which may lead to undesirable side effects. In contrast, herbal-based lozenges present a safer and more natural alternative, utilizing plant-derived substances known for their medicinal properties. While both herbal and allopathic treatments exist, they often fall short in addressing all symptoms through a single formulation. The goal of this herbal lozenge formulation is to incorporate widely used traditional medicinal herbs and assess their effectiveness in alleviating cough symptoms.

Keywords: *Herbal Remedies, Traditional Medicine, Cough Relief, Throat Infections, Herbal Lozenges, Troches, Pastilles, Hard Candy Formulations.*

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I. INTRODUCTION

Lozenges are medicated tablets designed to dissolve slowly in the mouth, releasing active ingredients that provide relief to the throat. These are commonly used to manage symptoms like coughing and sore throat. As they dissolve gradually, they help reduce throat irritation and suppress coughing. Lozenges are readily available at most pharmacies and retail stores without a prescription.

Herbal lozenges, which come in small tablet or pill forms, are typically formulated using a combination of herbs and natural substances. These herbal ingredients are selected based on their potential health benefits, depending on the type of herbs included.

Coughing is a natural protective mechanism triggered by stimulation of the reflex arc. It helps in expelling secretions and foreign particles from the respiratory tract. This reflex also plays a crucial role in defending the body from pathogens and clearing inflammation-related secretions.

While coughing can be protective, excessive or productive coughing may damage the lining of the respiratory tract. It often occurs due to irritation of cough receptors located in the oropharyngeal region.

Lozenges are frequently used for initial management of cough and other bronchial issues because of their soothing action. Their ease of use and pleasant taste make them a convenient option. When sucked slowly, they release medication gradually, allowing for localized therapeutic effects over time. They also require minimal equipment for production, making them a cost-effective remedy.

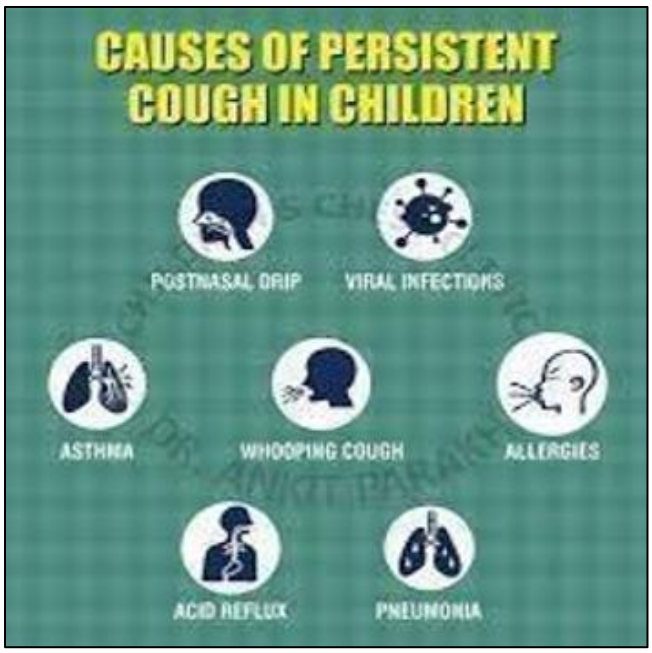

Fig 1 Cause of Cough

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Fig 2 Types of Cough

A. Drug Profile

➢ *Pepper*

- *Synonyms: Peppervine, Kali miri*

✓ *Structure:-*

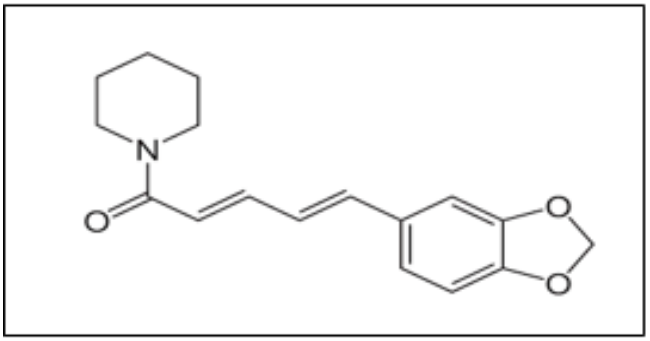

Fig 3 Pepper Chemical Structure

✓ CAS registry No: 84929-41-9
✓ Molecular formula: C17H19NO3
✓ Molecular weight: 305.40g/mol
✓ Chemical Name: (2E, 4E)-5-(2H- 1,3-benzodioxol-5-yl)-1-(piperidin- 1-yl)penta- 2,4-dien-1-one
✓ Appearance: Black green color
✓ Melting point: 128°C
✓ Boiling point :196°C
✓ Density :500-550g/mL
✓ Uses: These antiseptic spice as antimicrobial & anti-inflammatory which reduce the pain and and fight against cough and Thorat infection .
✓ Physicochemical properties- Melting point : 130°C
✓ Solubility: soluble in oil , alkali & practically insoluble in water .

B. Mechanism of action

➢ *Anti –Inflammatory Agent :*

piperine has been shown to inhabit a no of diffenrent molecule Inflammation in. Anti- inflammatoery agnet Ara indicated by suppuration of more potnet as an anti-proliferative agent ,also exhibited enhance anti –Inflammatory and anti –proliferative activites.

➢ *Anti –Microbial :*

The study has shown that curcumin damaged the permability and Integrity of bacterial cell Membrane of gram +ve & gram –ve

➢ *Storage:*

Place the peppers in a plastic bag, ideally with holes for air circulation, Store at container in cool ,dark ,pantry away from direct light & heat source, moisture.

C. Custurd Apple


Fig 4 Custurd Apple

➢ Synonyms: Sitafal, star fruit Family:Annonaceae
➢ Biological source: The custard apple (Annona squamosal) is a tropical tree native to the New World tropics, including South andCentral America.
➢ Part use: Leaves and Bark
➢ Medicinal Uses: Help to fight against certain chronic conditions, Antitumour activity, including cancer, diabetes, cardiovascular issues, and neurodegenerative conditions.)

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D. *Cardamon*

Fig 5 Cardamon Synonyms : Elettaria Cardamomum, Elaichi

- *Family:* Zingiberaceae

- *Biological source:*

Wild plants, native to the moist forests of southern India, but most cardamom is cultivated in India, Sri Lanka. art to be use:

Seeds

- *Medicinal Uses:*

- Treats Respiratory diseases, Reduces Frequent Urination, Nausea & Vomiting,
- Treats Dyspepsia & Heartburn, Treats Common Cold,
- Cures Tachycardia,

E. Bamboo

Fig 6 Bamboo

- Synonyms: Rattan, cane, Hardwood
- Family: Poaceae
- Biological source: Bamboo is native to Asia, Africa, and America.
- Part use:Leaves and Bark
- Medicinal Uses:Treating stomach disorders, diarrhea and for promoting stomach functions.

F. Cinnamon Bark

Fig 7 Cinnamon Bark Synonyms: Kalmi dalchini, Ceylon cinnamon

- Family: Lauraceae
- Biological source: Cinnamon is primarily sourced from Sri Lanka, though it is also cultivated in regions such as Malabar, parts of Southeast Asia like Cochin-China and Sumatra, as well as various Eastern islands.
- Part use: Bark
- Medicinal Uses: Dietary supplement for diabetes or for irritable bowel syndrome .

G. Pepper

Fig 8 Pepper

- Synonyms: Piper,fiddler,Organist,Drummer Family :Piperaceae
- Biological source: It consists of dried unripe fruits of piper nigrum linn
- Part use: Fruits
- Medicinal Uses:It is a rich source of manganese, a mineral known to support bone health, aid in wound healing, and play a role in metabolic processes.

H. Honey:

Fig 9 Honey

- Synonyms: Madhu, Honey purified
- Family: Apidae
- Biological source: Honey is a natural product produced by honey bees
- Medicinal Uses: Anti-inflammatory, antioxidant and antibacterial age

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II. MATERIALS AND METHODS

A. Drug and chemical

- Sitafal powder **(**Custard apple powder**)**
- Bamboo powder
- Cardamom powder
- Cinnamon bark powder
- Pepper Powder
- Honey

Table 1 List of materials

Sr. no	Particular	Quantity	Role
1.	Sitafal powder	1.6 gm	Antioxidant
2.	Bamboo Powder	0.8gm	Anti inflammatory
3.	Cardamom powder	0.2 gm	Antibacterial
4.	Cinnamon Bark Powder	0.1 gm	Antidibetic/Antimicrobial
5.	Pepper Powder	0.4	Antibacterial

- *Glassware's and instruments*
  Beaker, Measuring cylinder, Conical flask, Heating mantle, Weighing balance, Mortar pestle

- *Ingredients*
  Custurad apple powder, Bamboo powder, Cardamom powder, Cinnamon bark powder, Pepper powder, Honey

Table 2 Formula for preparation of herbal lozenges:

Sr. No	Ingredients	Quantity taken
1.	Custard apple powder	1.6gm
2.	Bamboo powder	0.8gm
3.	Cardamom powder	0.2gm
4.	Cinnamon Bark Powder	0.1gm
5.	Pepper powder	0.4gm
6.	Honey	QS

III. METHOD OF FORMULATION OF LOZENGES

- All herbal ingredients were dried and grounded using domestic mixture
- Take honey with quantity sufficient then melt it
- Stand for 2-3 minutes.
- Then add 1.6 gm Sitafal powder (Custard apple) powder
- Required quantity of other herbal powder were weight and taken in mortar pestle
- Make homogeneous solution
- Pour all the solution in moulding pan to obtain perfect size Lozenges.
- Packaging properly and lable it.

Fig 10 Our Product. Herbal Lozenges

Fig 11 Marketed Product AYURTUSS Lozenges Lemon and Ginger

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Table 3 Our Formula for Preparation of Herbal Lozenges

Sr.no	Ingredients	Quantity	role
1)	Sitafal powder	1.6 gm	Antioxidant
2)	Bamboo powder	0.8 gm	Anti-inflammatory
3)	Cardamom powder	0.2 gm	Antibacterial
4)	Cinnamon Bark Powder	0.1 gm	Antimicrobial
5)	Pepper powder	0.4 gm	Antibacterial
6)	Honey	Q.S	Binder/ Antioxidant

Table 4 Formulation and Preparation Marketed Product: (AYURTUSS) Lemon and Ginger

Sr. No	Ingredients	Quantity	Role
1)	Pudina (Mentha)	5.75mg	Carminative agent
2)	Yashtimadhu	2.2mg	Anti-inflammatory
3)	Tailaprni	1.5mg	Antibacterial
4)	Karpura (cinnamomum camphora)	0.18mg	Antispasmodic, Antiseptic, Anti-infective,
5)	Favoured Sugar	Q.S	Binder

IV. EVALUATION PARAMETERS

- Hardness Test: To check the hardness of prepared lozenges we use Pfizer Tester.
- Friability Test: Friability testing is a method which is employed to determine physical strength of Lozenges by using Roche friabilator were 6 tablets are placed in friabilator and subjected to revolve at speed Of 25 rpm up to 10 revolutions then further weigh the tablet and calculate % friability.
- Thickness Measurement:Six lozenges were randomly selected from each batch, and their thickness was measured using Vernier calipers.
- Diameter:The diameter, size, and shape of the lozenges are influenced by the molds used. Lozenges can be produced in various shapes and sizes, but they are typically circular with either flat or biconvex surfaces.
- Weight Variation Test: To assess weight variation, the average weight of 20 lozenges was calculated. The individual weights of the lozenges were then compared to this average.
- Drug Content Estimation: A sample equivalent to 5 mg of the drug was dissolved in 50 ml of phosphate buffer solution (pH 6.8) and kept on a rotary shaker for 4 hours. The solution was then filtered, and the drug content was analyzed using a UV-visible spectrophotometer.
- Stickiness and Grittiness: The texture of the chewable lozenges, specifically their stickiness and grittiness, was evaluated through visual inspection by gently rubbing the lozenge sample between two fingers.
- Disintegration Time Test : For determination of disintegration time place 6 tablet in disintegration Apparatus and 29-32 cycle per minute at pH 6.8 by using phosphate buffer containing 15% starch.
- Testing : The stability study of herbal lozenges was performed at 38°C +_ 8°C/ 70+_5% RH And 25°C+_8°C/ 60+_5% RH respectively for months and I the formulation of lozenges were examined Visually for physical changes.
- Antimicrobial Activity : The antimicrobial activity was checked by using cupplate.

V. RESULT AND DISCUSSIONS

Apaperance Theprepared lozenges wase valuated for its odour andcolour .the colourwasfound to be brownin colour and odour was found to be aromatic. Texture Theprepared lozenges wasevaluated for its test was found to be smooth Mouth dissolving time Its was found to be 1.30 sec Shape Its was found to be spherical shape Average length The prepared lozenges was evaluated and average length was found to be 1.5cm

Table 5 Evaluation Parameter

Sr.No	Parameters	Our Herbal Lozenges	Marketed Lozenges (AYURTUSS)
1)	Color	Brown	Yellow
2)	Odour	Aromatic	Citrusy or lemony
3)	Texture	Smooth	Smooth
4)	Shape	Spherical	Spherical
5)	Taste	Sweet and Acrid	Sweet Lemony
6)	Thickness	4.5mm	4.3mm
7)	Hardness	3.7kg/cm.sq	4.2kg/cm.sq
8)	Friability	1.1%	1%
9)	Weight	2.7g	2.5g

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VI. CONCLUSION

The herbal lozenges is an alternative therapeutic option for throat discomfort and cough relief were successfully undertaken, with a focus on utilizing natural ingredients. The study highlighted the potential of herbal lozenges in providing effective relief for sore throat, cough, and associated symptoms, leveraging the healing properties of plants known in traditional medicine. The lozenges demonstrated a favorable formulation profile, with proper taste, stability, and desired therapeutic effects, particularly when compared to marketed products.

When comparing the herbal lozenges to AYURTUSS (a marketed lozenge brand), the herbal formulations were found to offer comparable or even superior results in terms of natural, non-synthetic content and therapeutic benefits. Ayurvedic herbs such

as pudina (mentha),yashtimadhu, thilaprni ,karpura (cinnamomum camphora) and favoured sugar used in the lozenges were especially effective in soothing irritation, reducing inflammation, and providing symptomatic relief. Furthermore, the herbal lozenges proved to have minimal side effects, offering a safer alternative to chemically formulated products.

In conclusion, the herbal lozenges formulated in this study offer a promising, natural alternative to synthetic lozenges like AYURTUSS. With further refinement in taste, packaging, and consumer education, herbal lozenges could become a mainstream productfor managing throat-related issues, providing an effective and safe remedy with fewer adverse effects.

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