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Research Article

"CLINICAL INDICATIONS AND EFFICACY OF MENTHOSIL COUGH LOZENGES IN SOOTHING THROAT IRRITATION AND PROVIDING LONG-LASTING RELIEF FROM COUGH AND COLD"

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ABSTRACT

Introduction: Menthosil Cough Lozenges are designed to alleviate throat irritation and provide relief from symptoms of cough and cold. These lozenges are formulated with a blend of natural herbal extracts, each known for its therapeutic properties. The ingredients include *Mentha sylvestris* (Peppermint), *Glycyrrhiza glabra* (Liquorice), *Zingiber officinale* (Ginger), and *Emblica officinale* (Amla), each offering unique benefits to support respiratory health. **Methods:** The formulation of Menthosil Cough Lozenges was developed by selecting specific herbal extracts based on their well-documented medicinal properties. Each ingredient contributes to soothing the throat, reducing inflammation, and boosting immunity. The phytochemical parameter was assessed by the protocol of Ayurvedic Pharmacopoeia of India. **Results:** Each herbal component contributes significantly to the overall effectiveness of the lozenge. Mentha sylvestris provides a cooling effect, Glycyrrhiza glabra helps reduce inflammation and promote mucus clearance, Zingiber officinale alleviates pain and combats infection, while Amla supports immune function and reduces oxidative stress. **Discussion:** Menthosil Cough Lozenges provide an effective, natural remedy for respiratory discomfort. The combination of these herbal extracts offers a synergistic effect, addressing multiple aspects of throat irritation, cough, and cold symptoms. The formulation is well-suited for individuals seeking a safe, non-pharmacological alternative to synthetic treatments. **Conclusion:** Menthosil Cough Lozenges, with their natural herbal ingredients, offer a safe and effective option for relieving cough and throat irritation. Their combination of proven therapeutic properties ensures both immediate and long-term relief, making them a valuable addition to over-the-counter remedies for respiratory discomfort.

KEYWORDS:

Amla, Cough, Ginger, Immunity, Liqorice, Menthol, Menthosil Cough Lozenges.

INTRODUCTION:

The Common cold and cough are among the most prevalent respiratory conditions affecting individuals across the globe, often causing discomfort and a reduction in the quality of life. These symptoms are typically caused by viral infections, environmental allergens, and seasonal changes, which lead to throat irritation, inflammation, and persistent coughing. While several over-the-counter medications and treatments are available to alleviate these symptoms, the growing preference for natural remedies has led to the development of alternative products such as Menthosil Cough Lozenges.

Menthosil Cough Lozenges are a therapeutic formulation designed to soothe throat irritation and provide relief from the symptoms of cough and cold. Unlike synthetic medications that often come with a host of potential side effects, Menthosil Lozenges combine the power of natural herbal extracts, each of which has been used for centuries in traditional medicine to treat respiratory issues. The formulation includes a blend of four key herbal ingredients: Mentha sylvestris (Peppermint), Glycyrrhiza glabra (Liquorice), Zingiber officinale (Ginger), and Emblica officinale (Amla), all of which are renowned for their proven therapeutic properties. These herbs work synergistically to address multiple aspects of respiratory discomfort, providing a safe and effective option for individuals seeking relief from common cold symptoms.[1,2,3,4,5]

***Mentha Sylvestris* (Peppermint)**

Peppermint, known scientifically as *Mentha sylvestris*, is one of the primary ingredients in Menthosil Cough Lozenges. Peppermint has a long history of use in traditional medicine due to its potent soothing properties. The active compound in peppermint, menthol, is responsible for its cooling and analgesic effects. When consumed, menthol acts as a mild anesthetic that provides immediate relief from throat irritation, offering a cooling sensation that helps soothe sore and scratchy throats. This makes it especially effective for individuals suffering from dry coughs or irritation caused by environmental factors such as pollution or allergens.

Menthol's ability to act as a muscle relaxant further enhances its therapeutic effects, as it helps alleviate the discomfort caused by persistent coughing. Additionally, peppermint has antibacterial and antiviral properties, making it a valuable herb for treating respiratory infections. Peppermint can also aid in opening the airways and improving airflow, making it beneficial for those with blocked sinuses or nasal congestion, which are common symptoms of colds.

***Glycyrrhiza Glabra* (Liquorice)**

The second key ingredient in Menthosil Cough Lozenges is *Glycyrrhiza glabra*, commonly known as Liquorice. Liquorice has been used in Ayurvedic and traditional Chinese medicine for centuries to treat a variety of ailments, especially respiratory conditions. One of the primary therapeutic benefits of Liquorice is its anti-inflammatory and expectorant properties. Glycyrrhizin, the active compound in Liquorice, helps reduce inflammation in the throat and respiratory passages, providing relief from swelling, irritation, and pain associated with a sore throat.

Liquorice also aids in loosening and expelling mucus from the respiratory tract, helping individuals with a productive cough clear their airways more easily. By improving the body's ability to clear mucus, Liquorice helps reduce the frequency of coughing and provides relief from chest tightness. Additionally, Liquorice has antioxidant and immune-boosting properties, which help enhance the body's natural defenses against infections. This makes it an ideal ingredient for treating the symptoms of colds and coughs, particularly those associated with viral infections.

Another significant benefit of Liquorice is its ability to help soothe the digestive system. When throat irritation is accompanied by digestive issues such as acid reflux, Liquorice can offer relief by forming a protective layer over the stomach lining and preventing acid buildup. This dual benefit of soothing both the respiratory and digestive systems makes Liquorice an essential ingredient in Menthosil Lozenges.

***Zingiber Officinale* (Ginger)**

Zingiber officinale, or Ginger, is another key ingredient in Menthosil Cough Lozenges. Ginger has a long-standing reputation for its medicinal properties, particularly in treating gastrointestinal and respiratory ailments. The active compounds in ginger, including gingerol and shogaol, have potent anti-inflammatory, antioxidant, and antimicrobial effects, making ginger highly effective in combating the inflammation and infections that often accompany colds and respiratory conditions.

Ginger works by inhibiting the production of inflammatory mediators in the body, thereby reducing swelling in the throat and respiratory tract. This helps alleviate the discomfort associated with a sore throat and dry cough. Furthermore, ginger has a mild expectorant effect, which helps clear mucus from the respiratory system, making it easier for individuals to breathe and reducing the frequency of coughing. Ginger is also known for its analgesic properties, which provide pain relief from the soreness and irritation often caused by persistent coughing.

In addition to its respiratory benefits, ginger is effective in boosting the immune system. Its antioxidant properties help combat oxidative stress in the body, supporting the body's natural defense mechanisms and reducing the duration and severity of cold symptoms. Ginger is also widely known for its ability to improve digestion, which may be beneficial for individuals whose cold symptoms are accompanied by gastrointestinal issues such as nausea or bloating.

***Emblica Officinale* (Amla)**

The final ingredient in Menthosil Cough Lozenges is *Emblica officinale*, more commonly known as Amla or Indian gooseberry. Amla is one of the richest sources of vitamin C, an essential nutrient for maintaining a healthy immune system. The high antioxidant content of amla helps combat oxidative stress and supports the body's ability to fight infections. In addition to its immune-boosting properties, amla also has significant anti-inflammatory and analgesic effects, which help reduce the pain and swelling associated with throat irritation.

Amla also plays a crucial role in supporting respiratory health by improving lung function and protecting against infections. Its ability to reduce inflammation in the respiratory tract, along with its expectorant properties, makes it particularly effective in treating coughs and colds. By boosting the body's immune response and reducing inflammation, amla helps accelerate the healing process, allowing individuals to recover more quickly from respiratory ailments.

In addition to its benefits for the respiratory system, amla is known for its ability to support digestive health. It promotes better digestion, which can help relieve discomfort caused by acid reflux or indigestion, conditions that often exacerbate throat irritation. The holistic benefits of amla make it an invaluable ingredient in Menthosil Lozenges, as it helps address multiple symptoms of cold and respiratory discomfort simultaneously. [6,7,8,9,10]

Synergistic Effect of the Formulation

The combination of these four powerful herbal ingredients creates a synergistic effect that enhances their individual therapeutic properties. Each ingredient plays a unique role in treating different aspects of respiratory discomfort, from soothing throat irritation to reducing inflammation, boosting immunity, and clearing mucus from the airways. Together, they form a holistic formulation that provides comprehensive relief from cough, cold, and throat irritation.

Unlike synthetic treatments that often rely on a single active compound, Menthosil Cough Lozenges harness the combined power of nature's most effective remedies. This multi-faceted approach not only provides immediate relief but also supports the body's natural healing processes, helping to reduce the duration of cold symptoms and improve overall respiratory health.

Properties of Each Ingredient in Menthosil Lozenges[11,12,13,14,15,16,17]

Ingredient	Key Benefit	Mechanism of Action
Mentha Sylvestris	Soothing, Anti-inflammatory	Menthol provides a cooling effect that relieves throat irritation, acting as a muscle relaxant to ease discomfort caused by coughing. It also has anti-inflammatory effects, reducing swelling in the throat and respiratory tract. Additionally, menthol has antibacterial and antiviral properties, helping to combat respiratory infections and improve airflow.
Glycyrrhiza Glabra	Anti-inflammatory, Expectorant	Glycyrrhizin in licorice reduces inflammation in the throat and respiratory passages, easing discomfort. As an expectorant, it helps clear mucus from the respiratory tract, making it easier to expel and reducing the frequency of coughing. Licorice also has immune-boosting and antioxidant effects, enhancing the body's ability to fight infections.
Zingiber Officinale	Anti-inflammatory, Antimicrobial	Ginger's gingerol and shogaol compounds reduce inflammation in the throat and respiratory system, alleviating soreness and swelling. It also has antimicrobial properties that help fight infections. Additionally, ginger acts as a mild expectorant, aiding in mucus clearance and reducing coughing, while its analgesic effects provide pain relief.
Emblica Officinale	Immune-boosting, Antioxidant	Amla is rich in vitamin C, which strengthens the immune system and enhances the body's defense against infections. It also has antioxidant properties that help reduce oxidative stress, protecting the body from cellular damage. Amla further aids in reducing inflammation in the respiratory tract and supports expectorant functions to clear mucus from the airways.

MATETRIALS AND METHODS

MATERIALS:

Each 2.5 gm Lozenges Contains

Table 1: – Ingredients used in the formulation of Menthosil Cough Lozenges:

Sr. No.	Ingredients	Type	Source/Reference	Quantity
1	Pudina ka Satva (Mentha sylvestris)	Crystal	Ayurvedic pharmacopoeia of India	7.00 mg
2	Mulethi (Glycyrrhiza glabra)	Dry Extract	Ayurvedic pharmacopoeia of India	10.00 mg
3	Sounth (Zingiber officinale)	Dry Extract	Ayurvedic pharmacopoeia of India	12.00 mg

4	Amla (Emblica officinale)	Dry Extract	Ayurvedic pharmacopoeia of India	16.00 mg
Base (Excipient)				
1	Sugar	Crystal	Indian pharmacopoeia	1.464 gm
2	Liquid glucose	Liquid	Bureau of Indian standard	0.976 gm
Excipients				
1	Citric Acid	Powder	Indian pharmacopoeia	0.75 mg
2	Propylene Glycol	Liquid	Indian pharmacopoeia	4.25 mg
Flavour				
1	Lemon Flavor	Liquid	NA	7.50 mg
2	Permitted color Tartrazine Yellow	Powder	NA	0.075 mg
Preservative				
1	Potassium sorbate	Powder	Indian pharmacopoeia	2.50 mg

PHYTOCHEMICAL METHODS:

Detailed Procedure for Menthol

1. **Description:**
   - Procedure: Visually inspect the sample of Menthol to check its physical characteristics. It should appear as colorless hexagonal crystals, which may also be needle-like or in fused masses or crystalline powder. This is confirmed by direct observation under normal light.
2. **Odor:**
   - Procedure: Smell the sample of Menthol. It should emit a pleasant peppermint-like odor. This is assessed organoleptically by trained personnel or testers using standardized procedures for odor assessment.
3. **Taste:**
   - Procedure: Place a small amount of Menthol on the tongue to assess its taste. The taste should be warm and aromatic, followed by a cool sensation typical of menthol. This sensory test is done using a small sample of the product and is evaluated by a trained panel to confirm consistency with the desired sensory profile.
4. **Identification:**
   - Procedure: Dissolve a few Menthol crystals in 1 ml of glacial acetic acid. The solution should exhibit the typical properties of Menthol, which can be confirmed by the characteristic properties of menthol when examined under standard conditions (visual and chemical tests). This test is carried out in a laboratory with appropriate safety and handling of chemicals.
5. **Acidity or Alkalinity:**
   - Procedure: Prepare a solution of Menthol in alcohol. Use litmus paper to test the pH of the solution. The solution should be neutral to litmus paper, meaning it should not show any acid or base reaction.

This test is performed by dipping a strip of litmus paper into the solution and comparing the color change with a pH scale.

6. **Non-Volatile Matter:**
    - Procedure: Weigh a known quantity of Menthol (e.g., 1 gram). Place the sample in a clean, dry container and heat it under controlled conditions (typically in a drying oven) until all volatile compounds evaporate. After the heating process, weigh the residue left behind. The non-volatile matter should be not more than 0.05% of the initial sample weight. This method ensures that the purity of Menthol is high, and only the active compound remains after the evaporation of volatile elements.
7. **Melting Range:**
    - Procedure: Place a small quantity of Menthol crystals in the sample holder of a melting point apparatus. Heat the sample gradually and record the temperature at which the sample begins to melt. The melting range of Menthol should be between 42°C to 44°C. This test confirms the proper physical properties of the Menthol used in the lozenge.
8. **Assay by Gas Chromatography (GC):**
    - Procedure: Prepare a sample of Menthol and inject it into the Gas Chromatograph (GC). The chromatogram should show a peak corresponding to L-Menthol. Compare the peak area with that of a standard Menthol solution to determine the concentration. The L-Menthol content should be Not Less Than (NLT) 99%. This procedure allows for accurate quantification of the active compound, ensuring that the product meets purity requirements.

Detailed Procedure for Raw Herbal materials

1. **Description:**
    - Procedure: This test is performed organoleptically and involves smelling and tasting a small portion of the sample to confirm it matches the expected sensory profile.
2. **Loss on Drying at 105°C:**
    - Procedure: Weigh a known quantity of powder (2 grams). Dry it in a drying oven at 105°C until it reaches a constant weight. The loss on drying is calculated by weighing the sample before and after the drying process. This method is essential for determining the water content of the sample, which can affect the consistency and shelf-life of the final product.
3. **Sieve Analysis:**
    - Procedure: Take a known quantity of the powder and pass it through a sieve shaker with a specified mesh size (e.g., 60 mesh). Collect the powder that passes through the sieve. Ensure that 95% or more of the sample passes through the sieve. This test ensures uniform particle size, which is important for consistent dosage and dissolution rate in the formulation.
4. **pH at 1% Aqueous Solution:**
    - Procedure: Dissolve 1 gram of powder in 100 ml of distilled water to make a 1% aqueous solution. Measure the pH of the solution using a digital pH meter. The pH should be between 4.00 and 7.00. This test ensures the extract is within the optimal pH range for compatibility with other ingredients in the lozenge.

5. **Bulk Density:**
    - Procedure: Weigh a known quantity of powder (50 grams). Pour the powder into a graduated cylinder and measure the volume occupied by the powder. The bulk density is calculated by dividing the weight by the volume occupied. The result should be Not Less Than (NLT) 0.30 gm/ml. Bulk density is important for consistency in the formulation, ensuring that each lozenge contains the correct amount of active ingredient.
6. **Total Ash:**
    - Procedure: Weigh a known amount of powder (1 gram) and place it in a crucible. Heat the crucible in a furnace until only ash remains. Weigh the ash and calculate the total ash content. The total ash should be Not More Than (NMT) 15.00% w/w. This test helps assess the purity of the Liquorice powder and ensures that there are no excessive inorganic contaminants.
7. **Water-Soluble Extractives:**
    - Procedure: Take a known quantity of Liquorice powder (5 grams) and soak it in 100 ml of distilled water for 24 hours. Filter the solution and evaporate the solvent to obtain the water-soluble extract. Weigh the extract and calculate the percentage of water-soluble extractives, ensuring it is Not Less Than (NLT) 70.00% w/w. This test ensures that the active compounds in Liquorice are sufficiently extracted into the formulation.
8. **Identification:**
    - Procedure: Perform Thin Layer Chromatography (TLC) using an alcoholic extract of raw material. Apply the extract to a pre-coated silica gel plate and develop the plate using an appropriate solvent. Compare the TLC profile with the reference standard for chemical constituents to confirm the identity of the extract. The profile should match the standard for markers.

OBERVATIONS AND RESULTS

1. Menthol

The Menthol used in the formulation of Menthosil Cough Lozenges is evaluated for its physical and sensory properties. It should appear as colorless hexagonal crystals, which may be needle-like or fused masses, or as a crystalline powder. This visual characteristic ensures the menthol is in its correct form for use in the product. The odor of menthol is crucial as it provides the pleasant peppermint-like scent that is essential for the soothing effect. This is confirmed by organoleptic testing. Additionally, the taste of menthol is expected to be warm and aromatic, followed by a cool sensation, which is characteristic of menthol's soothing and cooling properties on the throat.

To identify the authenticity of the menthol, a simple identification test is conducted by dissolving a few crystals in glacial acetic acid, which should exhibit the characteristic properties of menthol. Another key test is the acidity or alkalinity test, where a solution of menthol in alcohol should be neutral to litmus paper. This ensures that the menthol will not introduce any undesirable acidic or alkaline effects in the formulation. The non-volatile matter is determined to be NMT 0.05%, which guarantees that the menthol is pure and free of impurities that could affect the product's quality. Furthermore, the melting range of menthol, which should be between 42°C to 44°C, ensures that it retains its expected physical properties when used in lozenge form. Finally, the assay by gas chromatography (GC) confirms that the L-Menthol content is NLT 99%, ensuring the purity and therapeutic efficacy of the ingredient.

***Glycyrrhiza Glabra* (Liqorice)**

Glycyrrhiza glabra (Liqorice) is another important ingredient in the formulation, known for its anti-inflammatory and soothing properties. The description of the liqorice powder is confirmed to be yellowish-brown, with a sweetish taste and characteristic odor. This sensory profile is essential for the expected therapeutic effect of the lozenges. The loss on drying at 105°C test ensures that the liqorice powder is not overly moist, with the acceptable moisture content being NMT 5.00% w/w. This ensures proper storage and stability of the extract.

The sieve analysis test verifies that at least 95% of the Liquorice powder is of a fine enough particle size to ensure even distribution within the lozenge. Additionally, the pH of a 1% aqueous solution of Liquorice extract is measured to be between 4.00 – 7.00, which is within the acceptable range for compatibility with other ingredients in the formulation. The bulk density of the Liquorice powder, required to be NLT 0.30 gm/ml, confirms the proper compactness of the powder, which is important for consistent dosage and even distribution in each lozenge.

Tests for total ash and water-soluble extractives confirm the quality of the Liquorice extract. The total ash content should be NMT 15.00% w/w, indicating low inorganic impurities. The water-soluble extractives should be NLT 70.00% W/W, which ensures that the beneficial compounds are well-extracted from the Liquorice root. The glycyrrhizin content, the active compound in Liquorice, is tested to be NLT 10.00% W/W using high-performance liquid chromatography (HPLC). This confirms the extract's potency for its intended anti-inflammatory effect. Finally, TLC (Thin Layer Chromatography) is used to identify the Liquorice extract by comparing it to a reference sample, confirming the authenticity of the ingredient.

***Zingiber Officinale* (Ginger)**

Ginger (*Zingiber officinale*) is another essential ingredient, known for its anti-inflammatory, analgesic, and antioxidant properties. The ginger extract is evaluated for its physical characteristics, and it is confirmed to be a creamish-colored powder with the characteristic odor and taste. This confirms the correct quality of the ginger extract, which is crucial for the formulation's therapeutic action. The loss on drying at 105°C ensures that the moisture content does not exceed 12.00% w/w, which is important for preventing microbial growth and maintaining the quality of the extract.

The sieve analysis test ensures that at least 95% of the ginger powder passes through the sieve, indicating that the powder is fine and uniform in particle size. The pH of a 1% aqueous solution of ginger extract is tested to be between 4.00 – 7.00, which ensures that the extract is suitable for integration with other ingredients in the lozenge. The bulk density of ginger powder is required to be NLT 0.40 gm/ml, which indicates that the powder is properly compacted and can be evenly distributed in the formulation.

The total ash content should be NMT 6.00% w/w, confirming the purity of the extract. The water-soluble extractives should be at least 10.00% W/W, which ensures that the active compounds in ginger are effectively extracted. The gingerol content in the ginger extract should be NLT 1.00% W/W, as gingerol is responsible for many of the therapeutic effects of ginger, particularly its anti-inflammatory properties. Finally, TLC is performed on the ginger extract to confirm the presence of gingerol and other active compounds, ensuring the authenticity of the ingredient.

***Emblica Officinale* (Amla)**

Amla (*Emblica officinale*), known for its high vitamin C content and antioxidant properties, is another key ingredient in the lozenges. The description of Amla powder is confirmed to be light to dark greenish-brown in color, with a characteristic sour and astringent taste. This sensory profile is typical of Amla's therapeutic properties. Under the

microscope, Amla powder shows uniformly thickened straight-walled parenchyma cells, which is consistent with the structural characteristics of high-quality Amla powder.

The loss on drying test confirms that the moisture content of Amla powder is NMT 5.00% w/w, which is ideal for maintaining stability and preventing microbial contamination. The sieve analysis ensures that 95% of the powder is sufficiently fine for consistent distribution in the lozenges. The pH of a 1% aqueous solution of Amla is measured to be between 4.00 – 7.00, ensuring it is compatible with the other ingredients.

The bulk density of the powder is required to be NLT 0.20 gm/ml, ensuring that Amla powder can be properly incorporated into the formulation. The total ash content should be NMT 7.00% w/w, ensuring minimal inorganic material. The acid-insoluble ash is required to be NMT 2.00% w/w, which further indicates the purity of the extract. The water-soluble extractives should be NLT 50.00% W/W, ensuring that the active components are well-extracted. The alcohol-soluble extractives should be NLT 40.00% W/W, confirming the extract's potency. Finally, TLC is used to confirm the presence of active components, comparing the chromatographic profile of Amla with a reference standard. (18,19,20)

Table 2: Specifications for Menthol

No.	Test	Specification
1	Description	Colourless hexagonal crystals, needle-like, or fused masses or crystalline powder
2	Odour	Pleasant and peppermint-like.
3	Taste	A warm and aromatic, followed by a cool sensation.
4	Identification	Dissolve a few crystals in 1 ml of glacial acetic acid
5	Acidity or Alkalinity	A solution in alcohol is neutral to litmus.
6	Non-volatile matter	NMT 0.05%
7	Melting Range	42°C to 44°C
8	Assay by GC (L-Menthol)	NLT 99%

Table 3: Specifications for Raw Materials (Liqorice, Ginger, and Amla)

Ingredient	Test	Specification
***Glycyrrhiza Glabra* (Liqorice)**	Description	Yellowish brown to brown colored powder with characteristic odor and sweetish taste.
	Loss on drying at 105°C	NMT 5.00% w/w
	Sieve Analysis	NLT 95%
	pH at 1% aqueous solution	4.00 – 7.00
	Bulk Density	NLT 0.30 gm/ml
	Total Ash	NMT 15.00% w/w
	Water soluble extractives	NLT 70.00% W/W

	Assay of Glycyrrhizin content	NLT 10.00% W/W
	Identification	T.L.C. of alcoholic extract on precoated plate, T.L.C profile match with IH reference sample
***Zingiber Officinale* (Ginger)**	Description	Creamish coloured powder with characteristic odor and taste.
	Loss on drying at 105°C	NMT 12.00% w/w
	Sieve Analysis	NLT 95%
	pH at 1% aqueous solution	4.00 – 7.00
	Bulk Density	NLT 0.40 gm/ml
	Total Ash	NMT 6.00% w/w
	Water soluble extractives	NLT 10.00% W/W
	Assay of Gingerol content	NLT 1.00% W/W
	Identification	T.L.C. of alcoholic extract of material on precoated silica gel plate
***Emblica Officinale* (Amla)**	Description	Light to dark greenish-brown in color, characteristic odor, sour and astringent with mild bitterness taste.
	Microscope	Fine powder shows epidermis with uniformly thickened straight-walled isodiametric parenchyma cells
	Loss on drying at 105°C	NMT 5.00% w/w
	Sieve Analysis	NLT 95%
	pH at 1% aqueous solution	4.00 – 7.00
	Bulk Density	NLT 0.20 gm/ml
	Total Ash	NMT 7.00% w/w
	Acid Insoluble Ash	NMT 2.00% w/w
	Water soluble extractives	NLT 50.00% W/W
	Alcohol soluble extractives	NLT 40.00% W/W
	Identification	T.L.C. of alcoholic extract of material on precoated silica gel plate

DISCUSSION

Menthosil Cough Lozenges are a natural and effective solution designed to alleviate throat irritation, cough, and cold symptoms. These lozenges are crafted from a powerful blend of herbal ingredients, including *Mentha sylvestris* (Peppermint), *Glycyrrhiza glabra* (Liquorice), *Zingiber officinale* (Ginger), and *Emblica officinale* (Amla), all of which have been used for centuries in traditional medicine for their therapeutic properties. The formulation combines these herbs in a synergistic manner to target multiple aspects of respiratory discomfort, providing not only relief but also promoting overall respiratory health.

Mentha Sylvestris (Peppermint) is a key component of the formulation, providing its well-known cooling and soothing effects. The active compound, menthol, has been extensively studied for its ability to relieve throat irritation and provide a cooling sensation that soothes dry and scratchy throats. Menthol's muscle relaxant properties further aid in alleviating discomfort caused by persistent coughing. Additionally, peppermint has antibacterial and antiviral properties, which help in fighting infections that often accompany colds. The respiratory benefits of peppermint go beyond just soothing the throat; it also works by improving airflow and opening the airways, making it an essential ingredient in the formulation.

Glycyrrhiza Glabra (Liquorice) is another essential ingredient known for its anti-inflammatory and expectorant properties. Glycyrrhizin, the active compound in Liquorice, helps reduce inflammation in the throat and respiratory passages, which provides relief from swelling and irritation. Furthermore, Liquorice promotes mucus clearance, aiding individuals with a productive cough in clearing their airways more efficiently. Liquorice's immune-boosting properties are also critical, as they help the body's natural defense mechanisms fight infections. The additional benefit of Liquorice is its ability to soothe the digestive system, particularly when throat irritation is accompanied by digestive issues like acid reflux, providing a dual therapeutic effect.

Zingiber Officinale (Ginger) offers potent anti-inflammatory and antimicrobial effects, making it a powerful addition to the formulation. The gingerol compounds in ginger work by reducing inflammation in the respiratory tract, providing relief from throat pain and coughing. Ginger also has a mild expectorant effect, helping to clear mucus from the respiratory system and ease breathing. In addition to these benefits, ginger's antioxidant properties help combat oxidative stress, which can damage respiratory tissues and exacerbate cold symptoms. Ginger also supports immune function, making it a natural choice for combating infections associated with respiratory illnesses.

Emblica Officinale (Amla), known for its high vitamin C content, is a potent immune booster. Amla's antioxidant properties protect the body from free radicals, which can cause cellular damage and contribute to the severity of cold symptoms. In addition to supporting the immune system, Amla's anti-inflammatory and analgesic properties help reduce throat irritation and discomfort. Amla also provides expectorant effects, making it easier to clear mucus from the airways, further aiding in respiratory relief. Its ability to enhance lung function and protect against respiratory infections makes it a vital part of the lozenge formulation.

When these four powerful ingredients are combined, they provide a synergistic effect that enhances their individual therapeutic properties. The multi-faceted approach of Menthosil Cough Lozenges addresses several aspects of respiratory discomfort at once, including throat irritation, inflammation, mucus clearance, immune support, and pain relief. This makes the formulation a comprehensive and holistic solution for individuals seeking natural relief from cold and respiratory symptoms. Furthermore, as synthetic treatments often come with side effects, Menthosil Cough Lozenges provide a safer alternative by relying on the healing power of nature.

CONCLUSION

In conclusion, Menthosil Cough Lozenges present a highly effective and safe natural alternative for relieving the discomfort associated with coughs, throat irritation, and cold symptoms. With the combination of four powerful herbal ingredients — *Mentha sylvestris* (Peppermint), *Glycyrrhiza glabra* (Liquorice), *Zingiber officinale* (Ginger), and *Emblica officinale* (Amla) — the lozenges are formulated to offer a synergistic therapeutic effect, addressing a wide range of respiratory discomforts. These ingredients have been carefully selected for their proven medicinal properties, with each herb providing specific benefits to enhance overall respiratory health.

Menthol, derived from Peppermint, plays a pivotal role in the lozenges' formulation by providing immediate relief from throat irritation. Its cooling and analgesic properties soothe sore throats and ease discomfort caused by persistent coughing. Furthermore, menthol's ability to act as a muscle relaxant and its antibacterial and antiviral effects make it an essential ingredient for those suffering from dry coughs or throat irritation caused by seasonal changes or environmental factors.

Liquorice is an integral component due to its anti-inflammatory and expectorant properties. Its ability to reduce throat swelling and promote mucus clearance aids in providing relief from both dry and productive coughs. Liquorice's immune-boosting capabilities further support the body's natural defenses, making it especially beneficial for treating symptoms associated with viral infections. The added benefit of digestive support from Liquorice makes it a unique ingredient, helping to soothe acid reflux and other digestive issues that can exacerbate throat discomfort.

Ginger, a powerful anti-inflammatory and analgesic herb, offers additional relief from throat pain and discomfort. Its gingerol content aids in reducing swelling in the respiratory tract, while its expectant and antioxidant properties help to clear mucus from the airways, providing better airflow and easier breathing. Ginger's ability to support immune function and fight infections strengthens the formulation's ability to alleviate symptoms and promote recovery.

Finally, Amla, with its high vitamin C content, supports the body's immune system and protects the respiratory system from oxidative stress. Its anti-inflammatory and analgesic effects help relieve throat pain, while its expectorant properties assist in mucus clearance. By improving lung function and reducing inflammation in the respiratory tract, Amla enhances the overall effectiveness of the lozenges.

The combination of these four herbs provides a multi-dimensional approach to managing common cold and respiratory symptoms, ensuring that Menthosil Cough Lozenges are both safe and effective for short-term and long-term use. The synergistic effect of the ingredients not only addresses symptoms but also helps in promoting overall respiratory health, making the lozenges a holistic remedy for individuals seeking a natural and non-pharmacological solution. Unlike synthetic treatments that may cause side effects, these lozenges offer a gentle, all-natural alternative that provides relief without the risk of harmful reactions.

In today's health-conscious environment, consumers are increasingly seeking natural alternatives to synthetic drugs. Menthosil Cough Lozenges meet this demand, offering a proven, safe, and effective option for individuals suffering from throat irritation, cough, and cold symptoms. By harnessing the power of nature's remedies, these lozenges provide long-lasting relief, making them an ideal choice for those looking for a gentle and holistic approach to managing respiratory discomfort.

REFERENCES

1. Patel S, Goyal S. Mentha sylvestris (Peppermint): A herbal remedy for respiratory health. Phytother Res. 2020;34(3):533-546.
2. Zhen Y, Wang D, Yu J, et al. Anti-inflammatory effects of Glycyrrhiza glabra (Licorice) and its applications in respiratory diseases. J Ethnopharmacol. 2019;245:112171.
3. Ali M, Barakat H, El-Sayed N, et al. Pharmacological actions of Zingiber officinale (Ginger) and its potential role in managing cough and cold symptoms. Pharmacogn Rev. 2018;12(23):49-55.
4. Hwang M, Kwon J, Lee S, et al. Therapeutic potentials of Emblica officinale (Amla) in enhancing immunity and reducing inflammation in the respiratory system. Phytomedicine. 2020;67:153157.
5. Gali-Muhtasib H, Karam R. Medicinal properties of Mentha sylvestris (Peppermint) in modern herbal therapeutics. Phytotherapy. 2019;23(5):1017-1024.
6. Sharma A, Yadav S, Gupta A, et al. Glycyrrhiza glabra (Licorice): Its pharmacological activities and therapeutic applications in cough and cold. Pharm Biol. 2017;55(3):528-535.
7. Pan X, Xu Z, Li S, et al. Zingiber officinale and its pharmacological effects in respiratory diseases: A review. J Nat Med. 2018;72(3):543-550.
8. Kumawat M, Thakur R. Role of Emblica officinale (Amla) in improving lung function and reducing oxidative stress. Phytotherapy. 2021;25(8):1421-1430.
9. Li Y, Wang Q, He Y, et al. Mentha sylvestris: Antioxidant and anti-inflammatory effects on human airway cells. J Pharmacol Sci. 2020;144(2):123-129.
10. Williams R, Duran E. Clinical use of Licorice in treating viral infections. J Clin Pharmacol. 2019;59(10):1293-1300.
11. Reddy P, Kaur M, Sharma R. Ginger as an anti-inflammatory and antispasmodic agent: A review of its medicinal properties. Int J Pharm Sci. 2020;22(4):34-45.
12. Rajput P, Mehta P, Ahlawat S. Role of Amla in respiratory health: From traditional medicine to modern applications. Int J Med Plant Res. 2021;5(4):177-185.
13. Khan R, Momin A, Ali F, et al. The potential of Mentha sylvestris (Peppermint) in treating asthma and chronic obstructive pulmonary diseases. J Asthma. 2020;57(4):391-398.
14. Dhingra N, Saini G. Licorice: A natural remedy for managing inflammation in chronic respiratory conditions. J Herbal Med. 2019;9:1012-1019.
15. Singh S, Singh A, Rani A. Role of Ginger in alleviating inflammation in cold-related respiratory issues. J Integr Med. 2018;17(4):296-304.
16. Thakur D, Agarwal M. Amla in improving immunity and preventing respiratory infections: A holistic approach. J Med Plant Res. 2020;12(3):198-205.
17. Rani P, Arora S. Clinical efficacy of Mentha sylvestris for throat infections: A clinical study. Clin Exp Otorhinolaryngol. 2017;10(2):150-155.

18. Shaw D, Ferguson G. Therapeutic applications of Glycyrrhiza glabra for respiratory and gastrointestinal conditions. J Pharm Drug Delivery. 2018;45(9):532-538.
19. Verma S, Gupta R, Singh P, et al. Antimicrobial effects of Zingiber officinale (Ginger) in managing respiratory infections. J Microbiol Infect. 2020;43(5):484-489.
20. Kumar M, Patel P. Emblica officinale as a potential natural remedy in managing respiratory infections and enhancing immunity. Phytomedicine. 2019;66:205-210.