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"Therapeutic Potential of Jasmine Herbal Lozenges in the Treatment of Recurrent Aphthous Stomatitis"

Sanika Sanjay Gondkar[1], Mr. Kiran Waghmare[2], Dr. Gaffar Sayyed[3], Dr. Sanjay Garje[4], Shri Amolak Jain[5]
[1]*Students, Shri Amolak Jain Vidya Prasarak Mandal's College Of Pharmaceutical Science And Research Center, Kada, 414202 Ashti, Beed, Maharashtra, India*
[2]*Assistant Professor, Shri Amolak Jain Vidya Prasarak Mandal's College Of Pharmaceutical Science And Research Center, Kada, 414202 Ashti, Beed, Maharashtra, India*
[3]*Principal, Shri Amolak Jain Vidya Prasarak Mandal's College Of Pharmaceutical Science And Research Center, Kada, 414202 Ashti, Beed, Maharashtra, India*
[4]*Assistant Professor, Shri Amolak Jain Vidya Prasarak Mandal's College Of Pharmaceutical Science And Research Center, Kada, 414202 Ashti, Beed, Maharashtra, India*
[5]*Vidya Prasarak Mandal's College Of Pharmaceutical Science And Research Center, Kada, 414202 Ashti, Beed, Maharashtra, India*

Abstract: ***Mouth ulcers, also known as aphthous ulcers, are common inflammatory lesions that affect the mucous membranes of the oral cavity. They can cause significant discomfort, pain, and difficulty in eating, drinking, and speaking. Conventional treatments, such as topical corticosteroids and antiseptic gels, often provide temporary relief and may have undesirable side effects. In response to the growing demand for safe and effective natural remedies, this study focuses on the formulation and evaluation of herbal lozenges containing Jasminum sambac (jasmine) extract for the treatment of mouth ulcers. Jasminum sambac is traditionally known for its anti-inflammatory, analgesic, antimicrobial, and soothing properties, making it a suitable candidate for oral ulcer therapy. The lozenges were prepared using a traditional candy base, ensuring a slow and sustained release of active herbal ingredients, allowing direct and prolonged contact with the ulcerated area in the mouth.***

The formulated lozenges were evaluated for various physicochemical parameters including hardness, uniformity of weight, friability, pH, and disintegration time. Phytochemical screening confirmed the presence of bioactive constituents such as flavonoids, tannins, and alkaloids that contribute to the therapeutic action. The results suggest that the herbal jasmine lozenges are not only effective in treating mouth ulcers but are also stable, palatable, and safe for oral use. The lozenge form offers convenience, accurate dosing, and prolonged action, which can improve user adherence and therapeutic outcomes. Given the increasing preference for herbal and natural treatments, this formulation presents a viable alternative to synthetic oral ulcer therapies. In conclusion, herbal jasmine lozenges are a promising natural solution for mouth ulcer treatment, offering a blend of traditional herbal benefits and modern pharmaceutical convenience.

Keyword: lozenges, Jasminum sambac, Jasmine.

I. INTRODUCTION

Jasmine is a genus of shrubs and vines that belong to the Oleaceae family, renowned for their beautiful, fragrant flowers. There are over 200 species of jasmine, which are native to tropical and subtropical regions of Eurasia, Australasia, and the Himalayas. The genus is primarily characterized by its simple, opposite leaves, and its star-shaped flowers that are typically white, yellow, or pink. Some species may even bear red or purple flowers. These flowers are known for their strong, sweet fragrance, which is a key feature that has made jasmine a popular plant in perfumery and aromatherapy. Jasmine plants can be either evergreen or deciduous, depending on the climate. They tend to thrive in warm environments with plenty of sunlight, though some species, such as the common jasmine (Jasminum officinale), can also tolerate cooler temperatures. Many varieties are climbing vines that grow rapidly when supported, while others are bush-like shrubs that spread horizontally. In addition to their ornamental value, jasmine flowers have a long history of cultural significance. The flower is often associated with love, beauty, and purity in various cultures. For example, jasmine is the national flower of the Philippines and Indonesia, and in India, it is revered for its religious symbolism and used in religious ceremonies.

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Jasmine is also common in wedding celebrations, representing love and fidelity. Apart from its cultural importance, jasmine is valued in aromatherapy for its calming and mood-enhancing properties. The essential oil extracted from jasmine flowers is known to alleviate stress, improve mood, and promote relaxation. Additionally, jasmine has been used in traditional medicine for its potential benefits in treating a variety of ailments, from digestive issues to skin conditions. Thus, jasmine is much more than just a beautiful flowering plant; it is a multifaceted species with cultural, medicinal, and aromatic significance.



Fig 1 [4]

A. Scientific Classification: [5]

1) Synonyms - Climbing plant, Summer jasmine, White jasmine.
2) Botanical name – Jasminum Sambac Linn
3) Family – Oleaceae
4) Kingdom – Plantae
5) Infrakingdom – Streptophyta
6) Superdivision – Embryophyta
7) Division – Tracheophyta
8) Order – Lamiales
9) Genus – Jasminum

Biological source
It consists of whole plant of Jasminum Sambac Linn belong into family of Oleaceae.

Geographical souce
Jasminum sambac, also known as Arabian jasmine, is native to the eastern Himalayas, including parts of India and Bhutan. It is believed to have been introduced to Arabian and Persian gardens from Asia, and then to Europe.

B. Other Name Of Jasmine: [6]

1) Scientific name – Jasminum spp
2) Local name – Jasmine
3) Hindi name – Juhi, Chameli
4) English – Arabian jasmine, Arabischer jasmine
5) Chinese – Mo li hua
6) Spanish – Jazmin de Arabia

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C. Chemical Constituents: [7][8][9]

Here are the key chemical constituents found in the jasmine plant i.e,

1) Alkaloids – Alkaloids in jasmine flowers and leaves contribute to their medicinal properties including their calming and sedative effects.
2) Volatile oil (Essential oil) – Benzyl acetate (1.24%), Linalool (4.92%), Benzyl alcohol, Methyl jasmonate, Indole (0.11%), Eugenol (0.15%), Farnesene, Nerolidol, etc.
3) Flavonoids – Quercetin and Kaempferol are also gives anti-inflammatory, antioxidant, anti cancer effects.
4) Saponins – It is also found in leaves and roots they contribute to the plant anti-inflammatory and immune modulating properties.
5) Tannins – Tannic acid contributes to the astringent and antimicrobial properties of jasmine leaves and flowers.
6) Coumarins – Compound that may provide blood thinning, anti-inflammatory and antimicrobial properties.
7) Glycosides – Compounds that may contribute to the plant's antioxidant and anti-inflammatory activities.
8) Sterols – Phytosterols like B-Sitosterol have anti-inflammatory and cholesterol lowering properties.
9) Carotenoids – A pigment contributing to the flower's color and providing antioxidant protection.
10) Fatty acid – Small amounts of fatty acid such as linoleic acid and oleic acid are found in essential oils and contribute to the plant's skin soothing properties.
11) Anthocyanins – Present in flowers, contributing to the plant's antioxidant and anti-inflammatory activities.
12) Triterpenoids – Known for their antimicrobial and anti-inflammatory properties, these compounds are found in various parts of the plant.

D. Morphological Description: [10]

1) Colour – They are most commomnly white but some species can produce yellow or pink flower.
2) Fragrance – Jasmine flowers are renowned for their strong, sweet fragrance, espescially in the evening and at night.
3) Type – Jasmine fruits are small berries which turn black when ripe.
4) Growth form – Jasmine plants are typically shrubs or small to medium sized climbers. Some species grow as erect or semi erect shrubs while others have long, trailing or vining up to 1.5 cm long .
5) Leaves – Leaves are dark green any glossy on the upper side with a paler green under side ((19). The leaves of jasminum sambac are simple, ovate, and 4 to 12.5 cm long.
6) Height – The plant grow to a height of about 6 to 9 feet.

E. Uses Of Jasminum Sambac: [11]

1) The flower of jasminum sambac are highly fragrant and are widely used in the production of essential oils, perfumes, skin creams, lotions, and scented product .
2) The calming aromais often used in aromatherapy to reduce stress, improve mood and promote relaxation .
3) It is also used to treat conditions such as headaches, fevers, wounds, skin and menstrual pain.
4) The flower are often used to make jasmine tea.
5) Jasmine tea is thought to have benefits including improving digestion and acting as an antioxidant.
6) It is used to reduce anxiety, depression, promote relaxation, better sleep, liver disease (hepatitis), abdominal pain .
7) It is also used to cancer treatment.
8) The leaves or flowers are sometimes used to prepare mouthwash to trat oral infection, ulcers or inflammation in the mouth.

F. Mechanism Of Action Of Jasmine [12]

Jasmine helps in mouth ulcers through the following mechanisms

- Anti-inflammatory: Reduces swelling and pain by inhibiting inflammatory mediators, promoting faster healing.
- Antioxidant: Neutralizes free radicals, reducing oxidative stress and aiding tissue repair.
- Antimicrobial: Prevents infection by inhibiting harmful bacteria in the ulcerated area.
- Astringent: Tightens tissues, reducing irritation and forming a protective barrier over the ulcer.
- Analgesic: Relieves pain by modulating pain receptors and reducing discomfort.

These combined effects support faster healing and reduce pain and inflammation in mouth ulcers.

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G. Route Of Administration [13]

Jasmine in the form of lozenges for mouth ulcers is administered oral through slow dissolving in the mouth. This allows the active ingredients to directly soothe the ulcerated area and promote healing. The lozenges dissolve over time, releasing the jasmine extract gradually to reduce pain and inflammation.

H. Dosage [14]

1 lozenge every 2-3 hours or as needed, not exceeding 6-8 lozenges per day.
Disease profile

I. Mouth ulcer [15][16]

A mouth ulcer, also known as an oral ulcer or canker sore, is a painful lesion that develops on the mucous membranes inside the mouth, including the inner cheeks, lips, tongue, gums, and the roof or floor of the mouth. These ulcers can vary in size, shape, and severity and are typically round or oval with a white, yellow, or grey center and a red border. It is a small, painful lesion that develops inside the mouth, typically on the inner cheeks, lips, tongue, gums, or the roof or floor of the mouth. These ulcers are usually round or oval in shape and have a white or yellowish center with a red border. Though they are usually harmless and heal on their own within 1 to 2 weeks, mouth ulcers can be quite uncomfortable, making eating, drinking, and speaking painful. In severe cases, persistent or recurrent ulcers might require medical attention or a treatment plan to help manage symptoms and identify any underlying causes.

Treatment often involves over-the-counter topical medications, pain relievers, and changes in diet or oral care habits to reduce irritation. If ulcers persist or are accompanied by other symptoms, it's important to consult a healthcare provider.

J. Causes of Mouth Ulcers (17)

Mouth ulcers can develop due to various factors, including:

- Injury or Trauma – Accidental biting, sharp teeth, braces, ill-fitting dentures, or excessive brushing can damage the delicate lining of the mouth.
- Nutritional Deficiencies – Lack of vitamins and minerals like vitamin B12, iron, and folic acid can lead to mouth ulcers.
- Stress and Anxiety – Emotional stress and lack of sleep can trigger ulcers in some people.
- Food Sensitivities – Spicy, acidic, or rough foods (like citrus fruits, chocolate, and nuts) can irritate the mouth and cause ulcers.
- Hormonal Changes – Hormonal fluctuations during menstruation, pregnancy, or menopause may increase the risk of ulcers.
- Infections – Viral, bacterial, or fungal infections (such as herpes simplex virus) can cause mouth ulcers.
- Underlying Health Conditions – Diseases like celiac disease, Crohn's disease, ulcerative colitis, and Behçet's disease may contribute to recurring ulcers.
- Immune System Disorders – Autoimmune conditions can lead to frequent mouth ulcers.
- Allergic Reactions – Some people develop ulcers due to an allergic reaction to certain foods, toothpaste ingredients (like sodium lauryl sulfate), or medications.
- Medications – Certain drugs, such as nonsteroidal anti-inflammatory drugs (NSAIDs), beta-blockers, and chemotherapy drugs, can cause ulcers as a side effect.

K. Symptoms of mouth ulcers (18)

Mouth ulcers typically cause the following symptoms:

- Pain or burning sensation in the affected area
- Red or white sores with a yellowish center
- Swelling or tenderness around the ulcer
- Difficulty eating, drinking, or talking due to discomfort
- Occasional bleeding from the ulcer if irritated

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Fig 2 [19]

L. Types Of Ulcer: [20][21]

Based on the duration ulcers can mainly classified into acute (short term) or chronic (long term). Acute ulcers continue no more than three weeks and retreat automatically such as traumatic ulcers, aphthous ulcers, herpetic ulcer and chancres. Chronic ulcers continue for weeks and months such as major aphthous ulcers, ulcers from odontogenic infection, malignant ulcers, gummas ulcers.

The lone lesions may results from a trauma, infection or it could be a carcinoma and can present as a single ulcerative lesion. Numerous lesions may be seen in viral infections or autoimmune diseases and can present with numerous ulcerations. Regular ulcers may present with a history of similar episodes along with intermittent healing. The sizeof the ulcers can differentiate from a few millimeters to centimeters and occur with fever and regional lymphadenopathy.

Mouth ulcers, also known as oral ulcers or canker sores, are painful sores that develop inside the mouth. They can vary in size, cause, and severity. Below is a detailed explanation of the different types of mouth ulcers:

1) Acute Ulcer

- Traumatic ulcers: It is a quit common and acute in nature. The ulcers are caused typically by physical, thermal or chemical trauma to the oral mucosa causing tissue damage andensuing ulceration. When the cause of the traumatic ulcer is removed, it usually heals in 7-10 days. A biopsy should be conducted if the ulcers do not heal after two weeks to rule out a deep fungal infection or cancer. In the basic and tertiary phases of syphilis, these ulcers are frequently solitary; however, in the primary and tertiary stages, syphilis can show as single ulcers.
- Necrotizing sialometaplasia: The disease necrotizing sialometaplasia (NS) can be acute or chronic. The palate is the most commonly affected location, followed by the lower lip, retromolar area, sublingual region, tongue, and larynx. The lesion begins as a non-ulcerated swelling with pain, and the necrotic tissue eventually sloughs away, leaving a crater-like ulcer. The ulcer is inflamed and has well defined edges. The size of the lesion varies from 1 cm to more than 5 cm in most cases. Within 5 to 7 weeks, it resolves on its own.

2) Chronic Ulcers

- Mucormycosis: Mucormycosis (phycomycosis) is an opportunistic infection caused bya saprophytic fungus that lives in the soil or on decaying food. Patients with low host resistance, such as those with poorly controlled diabetes, hematogic malignancies, cancer treatment, or immunosuppressive therapy, are more susceptible to infection.
- Tuberculous ulcers: Ulcerative lesions in the oral mucosa can be caused by granulomatous disorders. Oral symptoms of tuberculosis and leprosy can occur as a result of a systemic infection, but they are uncommon. Tuberculosis can affect the lungsor spread to other parts of the body. Tuberculous ulcers are painless, persistent, and angular with overhanging or undermined margins. They are also irregular and might be unpleasant.

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- Prevention and control: [22] The accurate cause of most periodic mouth ulcers is unknown, there is no certain way to prevent them. However, the following may help to reduce your risk of developing mouth ulcers.
  - ✓ Avoid damaging the inside of your mouth by using a soft toothbrush and avoiding hard, crispy foods.
  - ✓ Eat a healthy diet balanced, rich in vitamins.
  - ✓ Make clearly you maintain good oral hygiene, including brushing your teeth atleast twice a day.

II. AIM AND OBJECTIVES

A. Aim

1) Natural products from plants are rich sources used for treating a number of diseases.

2) Most of the herbal drugs are a mixture of a number of plant ingredients. Theirsynergistic effect increasesthe efficacy of the drug in curing the diseases.

3) In this modernera, the knowledge and experience of usage of herbs are being blend with advanced formulation technology to develop a safe and elegant herbal.

B. Objective

1) Formulation of medicinal plant in the form of a gel will be made by mixing of plant extracts in different proportions and tested for anti-ulcers activity.

2) Extracts of plants such as jasminum grandiflorum (leaf) are used for formulation of herbal gel for anti- ulcer property.

3) Then the formulated gel evaluated for parameters like physical properties, pH , viscosity, and stability.

III. MATERIALS AND METHODS

Drug – Leaf extract of *Jasminum grandiflorum*

A. Chemical

Honey, ***liquid*** glucose, Citric acid, Menthol crystals, orange oil, Color.

B. Preparation Of Extract:-[23]

Maceration: Process: The crude drug (either whole or coarsely powdered) is combined with a solvent (like alcohol or water) in a stoppered container. It is then allowed to stand at room temperature for at least 24-72 hours , with frequent agitation to help dissolve the soluble compounds in the drug. After this period, the mixture is strained, and the solid material (marc) is pressed. Finally, the liquids are clarified by filtration or decantation after allowing them to settle.

C. Preparation of Lozenges [29]

1) Syrup Formation

In a clean steel vessel, mix 20 g of Honey and 10 g of liquid glucose with ~5–6 mL of distilled water.
Heat gradually while stirring until the mixture reaches 135–140°C (hard crack stage), confirmed by the cold water test.

2) Incorporation of Actives

Cool the syrup slightly (~110°C) and add:

- 1.5 g of jasmine extract,
- 0.1 g citric acid,
- 2-3% gum Arabic,
- Optional 2–3 drops orange oil,
- Turmeric q.s.

Stir gently and uniformly.

3) Molding and Cooling

Pour the molten mass into lubricated molds or onto a greased tray.
Allow to cool at room temperature for 30–45 minutes until hardened.

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4) Shaping and Packaging

Cut into lozenge-sized units (~4 g each) if poured onto a tray.

Store in air-tight foil wraps or containers to avoid moisture absorption.

Formula

Batch A

Ingredients	Quantity
Drug	0.15 gm
Gelatin	5.4 gm
Glycerin	21 ml
Methylparaben	0.12 gm
Orange oil	1-2 drops
Distilled water	3.6 ml
Color	q.s

Batch B

Ingredients	Quantity
Drug	0.15 gm
Gum Acacia	5.4 gm
Glycerine	21 ml
Methylparaben	0.12 gm
Orange oil	1-2 drops
Distilled water	3-6 ml
Color	q.s

Batch C

Ingredient	Quantity	Uses
Jasminum sambac extract	1.5 g	Antibacterial / Anti-inflammatory
Honey	20 g	Base and sweetener
Liquid glucose syrup	10g	Prevents crystallization
Citric acid	0.1 g	Flavour enhancer, pH regulator
Gum arabic	2-3 %	Binding agent
Orange oil	2-3 drops	Flavouring agent
Distilled water	5-6 ml	Solvent
Turmeric powder	q.s	Coloring agent

D. Preliminary Phytochemical Investigation [24][25][26]

1) Test for Alkaloid Stock solution:

About 50 mg of solvent free extract is stirred add little quantity of HCl and filter it an perform various test for alkaloid.

- Mayer's reagent: To few ml of filtrate add two drop of Mayer's reagent if test is positive it give white/ creamy ppt.
- Swagner's test: To few ml of test solution add 2 drop of Wagner's reagent it gives reddish brown precipitate indicate test is positive.
- Hager's test: To few ml of test solution add 1-2 ml of Hager's reagent if test is positive solution gives prominent yellow precipitate.

2) Test for phenolic compound and tannin

- Ferric chloride test: About 50mg of extract is dissolved in distilled water and to this add few drop of neutral FeCl2 solution. Formation of blue, green and violet colour indicate the presence of phenolic compound.
- Lead acetate test: A small quantity of extract is dissolved in Distilled water andto this 3ml of 10% lead acetate solution is added. A bulky white precipitate indicate the presence of phenolic compounds.

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- Foam test: A small quantity of extract is diluted with distilled water to20ml. The suspension is shaken in graduated cylinder for 15 min. A two centimeter layer of foam or froth which is stable for 10 min indicate the presence of saponins.

3) Test for phytosterol

- Salkowoski test: Few drop of con. H2SO4 is added to the extract, shaken on standing, red colour in lower layer indicate the presence of steroid and golden yellow colour indicate the presence of triterpenoid.

4) Test for carbohydrates

Stock solution About 100mg of extract is dissolved in 5ml of distilled water and filtered. The filtrate is subjected to following test

- Molish test : To 2ml of filtrate two drop of alc. Solution of α-napthol is added. The mixture is shaken well and 1ml of concentrated H2SO4 added slowly .the tube is cooled violet ring at junction of two liquid indicate presence of carbohydrate.
- Barfoed's test: To 1ml of Salkowoski test solution add test few
- Benedict test: To 0.5ml of drop of barfoed's filtrate 0.5ml of Benedict's reagent is heated on a boiling water bath for 2ml. reagent. I added. The A characteristics coloured mixture precipitate indicate the presence of sugar.

5) Evaluation Test [27][28]

- Physical parameters: The herbal lozenges were evaluated for clarity, texture, and consistency. The stickiness of the lozenges was assessed through visual inspection.
- Hardness Test: The hardness of the prepared lozenges was evaluated using a Pfizer hardness tester.
- Friability Test : performed using a Roche friability apparatus at a speed of 5 rpm.
- Thickness Test: The thickness of each lozenge, measured in millimeters, was determined individually for 10 pre-weighed lozenges using vernier calipers.
- Weight Variation Test: Six lozenges from each batch were individually weighed in grams using an analytical balance.
- Disintegration Time: The time taken for lozenges to dissolve affects the release of active ingredients. For instance, certain herbal lozenges demonstrated a disintegration period of approximately 3.76 ± 0.08 minutes, ensuring timely release of therapeutic agents.
- Stability Studies: The optimized formulations were subjected to stability testing at 40°C and 75% relative humidity (RH) for a period of one month.

IV. RESULT AND DISCUSSION

1) Collection of Plant and Extraction: leave are collected from plant of jasminum gradiflorum and get air dried for 2-3 days. After drying we perform maceration process for 2-3 day with ethanol use as solvent.

2) Phytochemical Screening: For evaluation and identification of phytochemical present in plant perform various test, which are describe in table

Test	Leaf extract
Mayer's test	+ve
Wagner's test	+ve
Hager's test	+ve
Dragendroff's test	+ve
Ferric chloride test	+ve
Lead acetate test	+ve
Foam test	+ve
Salkowoski test	+ve
Molish test	+ve
Barfoed's test	+ve
Benedict test	+ve

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3) *Formulation of Herbal Lozenges:* Formulation of lozenges contain various expient which are described in table Every excipient have specific role in lozenges. Formulation methods for lozemges also describe. There is nitration between the leaf extract and excipient use in formulation of lozenges.

4) *Evaluation Test*

The herbal lozenges were prepared and evaluated. The result of evaluation was as follows:

Color: Yellow,

Texture: Smooth

Shape: Flat circular

- Hardness and Friability

Batch	Average Hardness (N)	Standard Deviation (±)
Batch A	144.1 N	± 2.2
Batch B	140.0 N	± 2.0
Batch C	145.5 N	± 1.8

- Friability Test

Batch	Initial weight (g)	Final weight (g)	% friability
Batch A	21.00	19.87	0.65%
Batch B	21.00	19.86	0.70%
Batch C	21.00	19.85	0.75%

- Thickness measurement

Batch	Average thickness	Standard deviation (±)
Batch A	5.20 mm	± 0.05
Batch B	5.22 mm	± 0.04
Batch C	5.18 mm	± 0.06

- Weight Variation Test

Batch	Average weight (g)	Min weight (g)	Max weight (g)	% Deviation Range
Batch A	1.00 ±0.02	0.98	1.02	± 2.0%
Batch B	1.01± 0.015	0.99	1.03	±1.9%
Batch C	0.99 ± 0.02	0.97	1.01	±2.2%

- Dissolution Time

Batch	Average Dissolution Time (min)	Standard Deviation (±)
Batch A	4.18	±0.10
Batch B	4.30	± 0.12
Batch C	4.25	±0.08

V. CONCLUSION

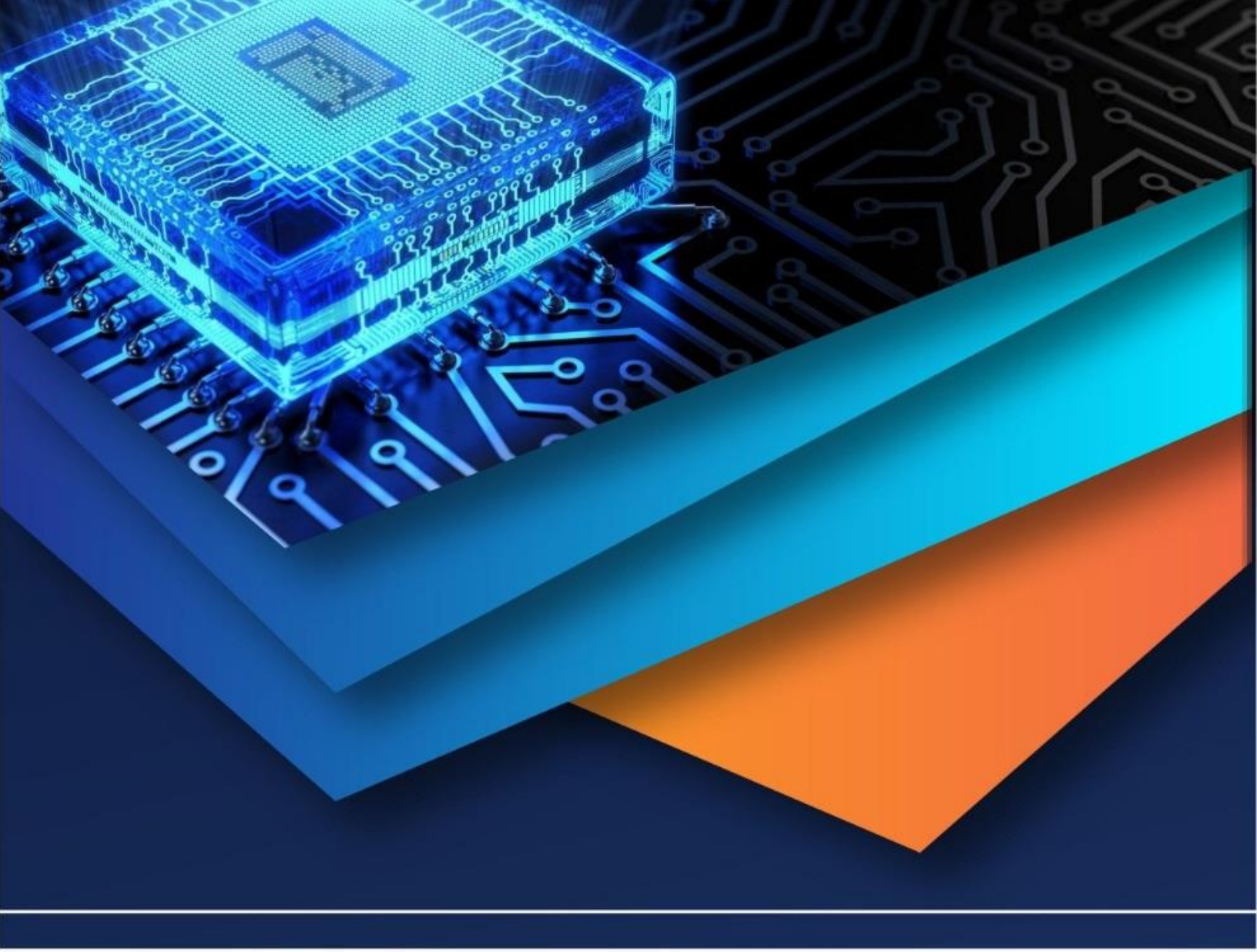
The development of herbal jasmine lozenges represents a promising natural approach for the effective management of mouth ulcers. Mouth ulcers are a common oral health issue that cause pain, discomfort, and difficulty in speaking and eating. Conventional treatments often involve chemical-based topical applications, which may have side effects and limited patient compliance. In this study, Jasminum sambac (jasmine) extract was selected as the primary active ingredient due to its well-documented anti-inflammatory, antimicrobial, and analgesic properties. Its incorporation into a lozenge form allows for direct and prolonged contact with the oral mucosa, which enhances its local therapeutic effects. In conclusion, hard herbal jasmine lozenges serve as a convenient, effective, and safe alternative to conventional treatments for mouth ulcers. Their natural composition makes them suitable for a wide range of users, including those seeking herbal remedies. With further clinical validation, these lozenges could become a widely accepted product in the field of oral healthcare and herbal therapeutics.

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