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A POLYHERBAL BASED ORAL HEALTH BENEFITS OF MOUTH FRESHENER, BOOSTING ORAL HYGIENE AND THEIR VARIOUS EFFECT OF BODY

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ABSTRACT

The use of polyherbal formulations for oral health has gained increasing attention due to their natural and multifaceted benefits. This review explores the potential of a polyherbal mouth freshener composed of betel leaf powder, sugar powder, fennel seeds, clove, Jasminum officinale powder, cardamom powder, licorice root, lemongrass oil, and orange oil. which contribute to oral hygiene and overall mouth freshness. Betel .this research contribute valuable insights to the field of polyhedral formulation for oral heath ,offering alternative or complementary formulation for oral mucosal disorders and bad breath (halitosis) ,remove bacteria and food particle.

KEYWORDS: *Betel (Piper betel), Mouth freshener, and pharmacological activities, Pan, Medicinal plant, Nutrious leaf.*

INTRODUCTION

Betel leaf powder, fennel seed powder, sugar powder, licorice root powder, cardamom powder, clove, lemongrass oil, and orange oil combine to form a potent polyherbal formulation used as a natural mouth freshener. This traditional blend harnesses the medicinal and aromatic properties of each ingredient to create a refreshing, soothing, and effective solution for oral hygiene and breath freshening.

Betel leaf powder is known for its antibacterial and antimicrobial properties, helping to cleanse the mouth and promote oral health. Fennel seeds contribute their mild, sweet flavor and digestive benefits, aiding in freshening breath while promoting digestion. Sugar powder enhances the palatability of the mixture and can also act as a gentle soothing agent for the mouth

Table 1: **Scientific Classification of Betel Leaf**

Synonyms	Chavica Beta. Artanthe Hixagona
Kingdom	Plantae
Order	Piperales
Family	Piperaceae
Genus	Piper
Species	Betle
Division	Magnoliphyta

Cardamom powder adds a pleasant flavor while offering digestive benefits and antimicrobial effects. Clove is renowned for its analgesic and antiseptic properties.

HISTORY

Ancient Origins

Early Use: Betel leaf has been cultivated and consumed for over 4,000 years. Its use is believed to have originated in the Indian subcontinent, with ancient texts and archaeological evidence suggesting that it was used for both medicinal and ceremonial purposes.

Cultural and Regional Spread

South Asia and Southeast Asia: Over time, the use of betel leaf spread across much of South Asia and Southeast Asia. It became an integral part of local culture, particularly in countries like India, Sri Lanka, Thailand, Indonesia, and the Philippines. In these regions, betel leaves are often chewed with areca nut and slaked lime to create a stimulant known as paan.

MEDICINAL USE

- Improves digestion and relieves constipation.
- Treats infections and mouth sores.
- Reduces pain from conditions like arthritis.
- Eases coughs, colds, and asthma.
- Reduces inflammation and swelling.

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- **PLANT PROFILE**

Taxonomical Classification

Kingdom	: Plantae
Division	: Magnoliophyta
Class	: Magnoliopsida
Order	: Piperales
Family	: Piperaceae
Genus	: Piper
Species	: Betel

Vernacular Names

Sanskrit	: Tambool, Muhbhushan, Varnalata
Hindi	: Paan
English	: Betel, Betel pepper, Betel-vine
Telugu	: Nagavalli, Tamalapaku
Tamil	: Vetrilai
Gujarati	: Nagarbael



Fig. 1. *Piper Betel* Plant



Fig. 2. *Piper Betel* Leaf

METHODOLOGY

Extraction methods for the crude drugs from betel leaves

Extracting crude drugs from betel leave involves various methods to obtain the active constituents, including essential oils, alkaloids, phenols, and flavonoids.

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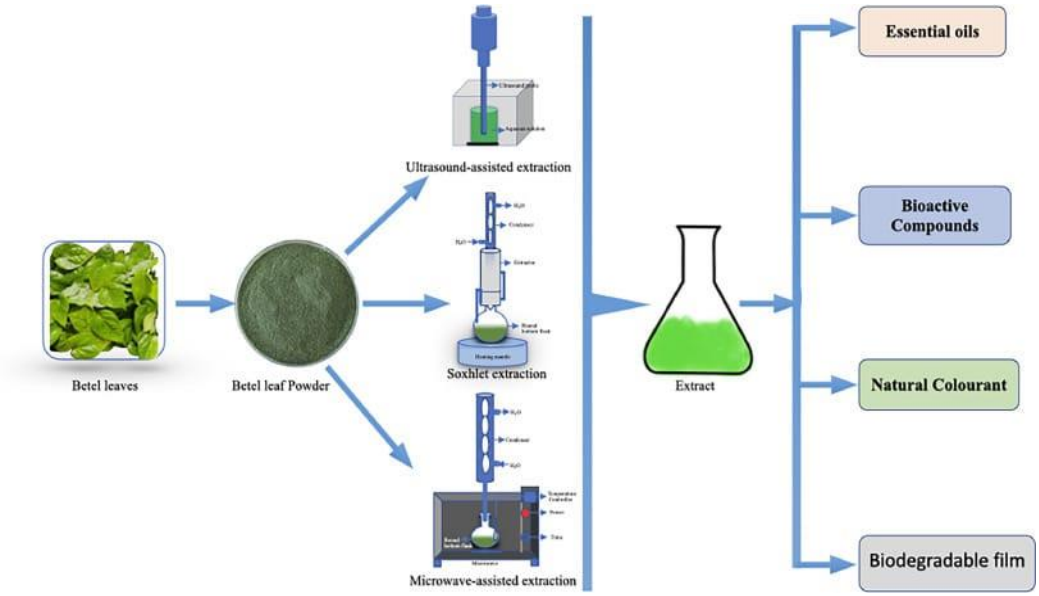


Fig.3 Extraction Method

Steam Distillation
Steam distillation is commonly employed to extract essential oils from betel leaves, which contain aromatic compounds like eugenol, chavicol, and cineole. Betel leaves are subjected to steam, which helps in releasing the volatile oils.

Solvent Extraction
Solvent extraction involves using organic solvents like ethanol, methanol, or hexane to dissolve the desired compounds from the betel leaves. Betel leaves are usually dried and ground into a powder. The powder is then mixed with the solvent, and the mixture is allowed to stand for a period to facilitate extraction

Soxhlet Extraction
Soxhlet extraction is particularly useful for extracting lipophilic compounds from betel leaves.The powdered betel leaves are placed in a thimble and loaded into a Soxhlet extractor.

Maceration
Maceration involves soaking the powdered betel leaves in a solvent for a specified period to allow the extraction of active constituents. The mixture is periodically agitated to enhance extraction efficiency

Percolation
Percolation involves passing a solvent through a bed of powdered betel leaves to extract the desired compounds. The solvent gradually percolates through the bed, picking up the active constituents as it passes through. The extract is collected at the outlet. Percolation is often used for large-scale extraction and allows for precise control over the extraction process**.**

Dry Granulation Method:
Weigh the polyherbal blend (fennel seed powder, clove, and lemon grass oil oil) according to the desired ratio. Mix the herbal powders thoroughly to ensure uniform distribution.

Dry Granulation: Pass the mixed herbal powder through a sieve (#60 or #80 mesh) to ensure uniform particle size.

Use a dry granulator or a mortar and pestle to granulate the powder into a coarse, free-flowing material**.**

Addition of Excipients
Add excipients like lactose, starch, or cellulose to improve flowability and compressibility. Mix well to ensure uniform distribution.

Lubrication
Add a lubricant like magnesium stearate or talc to reduce friction and improve tabletting. Mix well to ensure uniform distribution.

AYURVEDIC SIGNIFICANCE

- **Digestive Aid**: Betel leaves are considered to be heating and help stimulate digestion. They are commonly used to treat indigestion, bloating, and other digestive disorders. Chewing betel leaf can enhance appetite and improve the secretion of digestive enzymes.
- **Oral Health**: Betel leaves have antimicrobial properties and are used in Ayurvedic formulations to promote oral hygiene. They help prevent bad breath, gum disease
- **Antioxidant and Anti-inflammatory**: The leaf contains essential oils, phenols, and other compounds that have antioxidant, anti-inflammatory, and antimicrobial effects. This makes it useful for treating skin ailments, wounds, and infections.
- **Anti-stress and Relaxation**: Betel leaf has mild sedative properties that can help reduce stress and anxiety, promoting mental relaxation and well-being.
- **Sexual Health:** In Ayurveda, betel leaves are sometimes used to enhance libido and sexual vitality, often combined with other herbs for aphrodisiac properties.

CONTENT OF BETEL LEAF

Betel leaf (Piper betle) is a versatile plant commonly used in various cultures, particularly in South and Southeast Asia. The leaf contains several bioactive compounds, including essential oils, alkaloids like arecoline, and tannins, which contribute to

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its distinct aroma and therapeutic properties. Betel leaf is rich in antioxidants such as phenolic compounds, which have potential anti-inflammatory and antimicrobial effects. Terpene, Phenol, P-cymene, carvacrol, chavicol and its derivatives,allyl catechol, eugenol,estragol, oxalic acid, malic acid, amino acids etc. are found to be present in the betel leaves.

Essential Oil Content

MORPHOLOGY OF PIPER BETEL

Stem Characteristics

1. Robust Stem Varieties: Some betel vine varieties have robust, vigorous stems, contributing to their strong growth habit. Examples include Bangla, Kallimadugu and Calcutta varieties.



Fig 5: Green Betel



Fig 4: Red Betel



Fig 6: Black Betel

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Fig 7: Golden Betel

1. High Oil Content Varieties: These varieties have a high concentration of essential oils in their leaves, resulting in strong aroma and flavor. Examples include Calcutta and Kallimadugu varieties.
2. Moderate Oil Content Varieties: Varieties with moderate essential oil content offer a balanced aroma and flavor profile. Examples include Sanchi and Bangla varieties

Flavor Profile

1. Strong Flavor Varieties: Certain varieties are known for their intense flavor, often preferred for their bold taste in paan preparation. Examples include Bangla and Magahi varieties.

INDIVIDUAL BENEFITS OF KEY INGREDIENTS

1. The Power of Clove

Clove has been revered for centuries in traditional medicine for its strong antimicrobial properties. The active compound, eugenol, has natural analgesic, antibacterial, and antifungal effects, making clove an excellent choice for combating bad breath and promoting oral health.

2. Fennel Seed: (A Digestive Aid and Breath Freshener)

Fennel seeds are commonly used in herbal remedies for their digestive properties, but they also play a crucial role in freshening breath.

while their antibacterial properties help eliminate the bacteria responsible for foul-smelling breath.

3. Licorice Root: (Soothing and Protective)

Licorice root has long been known for its ability to soothe sore throats and support oral health. It contains glycyrrhizin, which has antibacterial and anti-inflammatory properties.



Fig.No.8

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4. Cardamom: (A Spice for Freshness)
Cardamom, a fragrant spice commonly used in Ayurveda, is known for its breath-freshening properties. It has been traditionally used as a natural mouth freshener and is also believed to have antiseptic properties that can help maintain oral hygiene.

5. Agar: (A Natural Binding Agent)
Agar, a natural plant-derived gelatin, is often used in herbal formulations to help bind ingredients together. In mouth fresheners, agar acts as a stabilizing agent.

6. Orange Oil: (Zesty and Antimicrobial)
Orange essential oil, extracted from the peels of sweet oranges, is not only refreshing but also packed with antimicrobial properties. It helps to fight the bacteria responsible for bad breath and can even uplift mood, giving your polyherbal mouth freshener a pleasant, citrusy aroma.

7. Lemon grass Oil: (A Powerful Antiseptic)
Lemongrass essential oil has potent antiseptic and anti-inflammatory properties. It is a natural disinfectant, making it an excellent addition to a polyherbal mouth freshener. Lemongrass oil helps to clear out bacteria in the mouth, reducing bad breath and supporting overall oral hygiene.

8. Jasmanium officinal : Jasminum officinale is utilized in the polyherbal mouth freshener for its antibacterial, anti-inflammatory, and antiulcer properties

TRADITIONAL USES OF BETEL LEAVES

Headache: Betel leaf is a popular home remedy for headache. The betel leaf has analgesic and cooling properties.

Scanty or Obstructed Urination: Betel leaf juice is credited with diuretic properties. Its juice, mixed with dilute milk and sweetened slightly, helps in easing urination.

Exhaustion And Debility. The juice of a few betel leaves, with a teaspoon of honey, will serve as a good tonic.

- **Sore Throat:** Betel leaf is an excellent household remedy in the treatment of cough and sore throat. Local application of the leaves is effective in treating sore throat. **Respiratory Disorders:** Betel leaves are useful in pulmonary affection in childhood and old age. The leaves, soaked in mustard oil and warmed, may be applied to the chest to relieve cough .
- **Constipation:** In the case of constipation in children, a suppository made of the stalk of betel leaf dipped in castor oil can be introduced in the rectum.
- **Problem of Breast milk secretion:** The application of leaves smeared with oil is said to promote secretion of milk when applied on the breasts during lactation .
- **Inflammation:** Applied locally, betel leaves are beneficial in the treatment of inflammation such as arthritis and orchitis that is inflammation of the testes.
- **Wounds:** Betel leaves can be used to heal wounds. The juice of a few leaves should be extracted and applied on the wound. Then a betel leaf should be wrapped over and bandaged..
- **Boils:** Betel leaf is also an effective remedy for boils. A leaf is gently warmed till it gets softened, and is then coated with a layer of castor oil.

KEY MECHANISM OF MOUTH FRESHENER

Polyherbal mouth fresheners typically work through a combination of antimicrobial, anti-inflammatory, and deodorizing properties of herbs. These herbs contain essential oils and compounds that help neutralize bad breath, inhibit the growth of odour-causing bacteria, and promote overall oral hygiene.

ADVANTAGE OF MOUTH FRESHENER

- **Natural Ingredients**: ensuring a natural and chemical-free
- **Antibacterial Properties**: Many herbs used in these mouth fresheners, like neem or clove,.
- **Improved Digestion**: Some herbal ingredients, such as cardamom and fennel, aid in digestion and may help alleviate bloating or indigestion.
- **Long-Lasting Freshness**: They provide long-lasting freshness due to the blend of herbs that neutralize odors.
- **Rich in Antioxidants:** Many herbs have antioxidant properties that promote overall health and protect the gums and teeth.
- **Prevention of Tooth Decay:** Some herbs help in reducing plaque and promoting oral hygiene, thereby potentially reducing the risk of tooth decay.

Disadvantages of Mouth Freshner

- **Allergic Reactions:** Some individuals may be allergic to specific herbs or ingredients, leading to irritation in the mouth or skin.
- **High Sugar Content:** Many commercial polyherbal mouth fresheners contain added sugars or artificial sweeteners, which can contribute to tooth decay.
- **Mouth Irritation:** Some herbs may cause a burning or tingling sensation in the mouth, especially if the product contains strong ingredients like mint or spices.

PHARMACOLOGICAL ACTIVITY

1. Antioxidant Activity
Betel leaves possess strong antioxidant properties due to the presence of polyphenolic compounds. These compounds help neutralize free radicals and reduce oxidative stress, which can contribute to chronic diseases like cancer, diabetes.

2. Antimicrobial and Antifungal Effects
Betel leaf has shown broad-spectrum antimicrobial activity against bacteria, fungi, and viruses..

3. Anti-inflammatory and Analgesic Activity
The leaves contain compounds that exhibit anti-inflammatory effects, which can help reduce inflammation in conditions like arthritis and other inflammatory disorders

4. Anticancer Properties
Betel leaf, especially its polyphenolic compounds, has shown potential anticancer activity by inhibiting the growth and spread of cancer cells.

5. Digestive Health
Betel leaves have been used traditionally to aid digestion. The active compounds stimulate the secretion of digestive enzymes and Betel leaves also act as a carminative .

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6. Cardiovascular Benefits

There is evidence to suggest that betel leaf has cardioprotective effects. It helps regulate blood pressure, reduce cholesterol levels, and improve blood circulation, thus supporting heart health.

7. Anti-diabetic Properties

Some studies have indicated that betel leaves can help regulate blood sugar levels, making it beneficial for managing diabetes.

8. Wound Healing

Betel leaf has antimicrobial and anti-inflammatory properties that can aid in wound healing. It has been traditionally used as a poultice for cuts, burns, and skin infections.

FUTURE SCOPE

A polyherbal mouth freshener based on betel leaf holds promising potential in the future due to increasing consumer demand for natural and functional oral care products. clove, and cardamom to enhance its flavor and effectiveness. With proper research, formulation, and regulatory approval, this polyherbal mouth freshener could become a staple in the global market.

CONCLUSION

Polyherbal mouth fresheners typically work through a combination of antimicrobial, anti-inflammatory, and deodorizing properties of herbs. These herbs contain essential oils and compounds that help neutralize bad breath, inhibit the growth of odor-causing bacteria, and promote overall oral hygiene. Overall , this polyherbal mouth freshener is a valuable addition to the oral care market, providing consumers with a natural and effective solution for maintaining optimal oral health. This type of formulation not only aligns with modern preferences for natural wellness but also integrates time-honored herbal knowledge into a convenient product for everyday use.

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