

A Comprehensive Review on the Role of Herbal Mouth Fresheners in the Management of Halitosis

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Abstract:- Halitosis is an unpleasant odor in the oral cavity that stimulates poor oral health. The bad odor is a taboo that creates hesitation and embarrassment in society. This is not under the voluntary control of an individual. Various herbal ingredients are found to refresh the bad odor and provide cooling sensations. This review focus on the herbal mouth fresheners which are used to treat Halitosis or Oral malodour. The review gives an introductory of mouth Freshners in combating halitosis, the traditional herbal ingredients and their efficiency in mouth Freshners and additional potent benefits such as Antimicrobial, antioxidants, anti-inflammatory, antifungal and wound healing properties were explored. Mouth fresheners are found to show an instant therapeutic efficacy in reducing bad odor, giving a refreshment which lasts for some period of time. It has also been more advantageous to use herbal mouth fresheners when compared to artificial or synthetic ones. Understanding the role of mouth Freshners in oral care highlights the overall well-being of the society. Hence, herbal mouth fresheners are the major requirement at present to combat the bad odor and to get instant effect which prevents the risk of hesitation, embarrassment, and anxiety with increased oral quality life of the people.

Keywords:- Halitosis, Herbal Ingredients, Instant, Mouth Freshner, Oral Malodour, Refreshment.

I. INTRODUCTION

Mouth Freshners or Halitosis masker is generally consumed to avoid the oral malodour and to get an instant therapeutic benefit. Mouth Freshners can be formulated in the form of Spray, Granules, powder, strips, etc. Hydrated or dehydrated herbal ingredients are used in the preparation of herbal mouth fresheners which serve as nutritive and taste masking factor [1]. Foul smell from the mouth is the major warning of miserable oral health [2]. Oral hygiene products are utilized as additives that deliver to provide notable cooling sensation to customers, especially to mask the bad breath [3]. There are about 400 microorganisms in the mouth, which emit the smell from the oral cavity or respiratory tract. People are therefore recommended to use chewing gums, chocolates, mouth washes, freshner and frequent brushing to keep a distance from bad breath [4]. During the periods of intimacy, in public places or in close association with others bad odour is regarded as nauseating. Apart from poor oral hygiene and dental problems, smoking, alcohol and tobacco

also have a significant role in Halitosis. Overeating, starvation may also give rise to Halitosis [5]. Nutritional mouth Freshners like Flaxseed, omega-3-fatty acid also provides the health benefits and economic Upliftment [6]. Herbal leaves comprise various biologically active components, which are accountable for antioxidant, antifungal, antibacterial, anti-inflammatory and chemo preventative activities, which are famous to mankind [7]. Oral cavity gives birth to disagreeable odour called Halitosis or Oral malodour. The crucial manifestation embraces psychosocial awkwardness and anxiety, Halitosis may seem simple and be ignored but it's very awful and causes long term effects [8]. Yet 50% of the public worldwide endures some or the other type of oral Halitosis [9]. The use of natural herbs in the formulation of herbal mouth freshner is been proven medically to avert the issue of bad breath and oral health, Mouth freshners are used as astringent, deodorizing agents, treating dental caries, and to destroy the bacteria. Herbal mouth freshners are designed to relieve pain and soothe irritation in mouth, to inhibit microorganisms, to reduce inflammation. Bacterial activity in an unclean mouth is the primary cause of bad breath. Hence the utilization of Antibacterial herbal mouth freshner enhances the oral quality life of the people [10]. Mouth freshners and mouth washes are the majorly credited delivery means of Anti-microbial agents after toothpastes [11]. The impact factor of herbal formulation is that there are no unhealthy ingredients present in the preparation. Herbs are readily available and cost effective which improves the immunity and assist in healing of dental infections. The world Health report, 2003 culminated oral health as an essential ad integral element of general health. Therefore, the traditional use of herbal mouth freshner removes the infectious agent in mouth due to its antibacterial property [12]. Devoid of chemical ingredients in herbal mouth freshners gives best results compared to chemical mouth spray [13].



Fig 1 Bad Odor

II. HISTORY OF HALITOSIS

Different types of food, bacterial coating of tongue, systemic disorders, and other periodontal diseases generate an offensive bad and unpleasant odor in the mouth called halitosis. It has always been a concern throughout history, various herbs and spices were used by ancient civilizations like the Egyptians and the Greeks to treat halitosis. Some people considered it as a spiritual or moral failing in the Middle Ages [14]. The advancement of medical science in the 19th century led to the development of understanding of halitosis. Today, oral malodor is seen as a multifactorial condition with poor oral health and underlying health issues [15].



Fig 2 How to get Rid of Bad Breath

➤ Definition:

The technical term for bad breath originates from the Latin word 'halitus', meaning breath and Greek word 'osis', meaning abnormal or diseased. The synonyms of the halitosis are fector Oris or fector ex ore, bad breath and breath malodor, however, these terms are not easily understood by the general population. Oral malodor is a condition in which the self-confidence of a person decreases gradually along with decreased social interactions [16].

➤ Socio-Economic Aspects:

Halitosis is considered as the social and relational problem. Every person might have experienced the unpleasant odor when speaking in close proximity to the other person. This is also called the 'halitophobia', which is an imaginary breath odor that can even commit to suicide of an individual. In some parts, there is a practice that if one partner of marriage has halitosis, the marriage license (the ketuba) is legally cancelled according to Jewish law. The corresponding health care system and the community is being interfered by the problem of halitosis. The Risk factors include dry mouth, smoking, dietary habits, alcohol consumption etc [17]

➤ Etiology:

The major cause of halitosis is related to oral disorders like gingivitis, periodontitis, tongue coating, etc. Other non-pathological and non-oral conditions have also been the

etioloical cause of halitosis, which include the infection in the upper and lower respiratory tract, GI tract diseases, and other metabolic diseases that involve the liver and kidney. Smoking and periodontal disease are found in higher cases of halitosis. Ear, nose, throat problems like tonsillitis, sinusitis, and rhinitis are linked to halitosis. Other conditions like dry mouth, certain foods, smoking, and gum disease also contribute to halitosis development. Male gender is more prone to halitosis when compared to females. The etioloical factors include the poor oral hygiene, less saliva in mouth, smoking, betel nut chewing, tobacco, periodontitis, gingivitis, tongue coating, etc. Even stress and GIT problems lead to the halitosis disease [18]

➤ Mechanism of Halitosis:

The breakdown of the food particles by the bacteria in the mouth produces foul-smelling components like volatile sulfur compounds (VSCs), hydrogen sulfide, and mercaptan that are responsible for foul odor in the mouth. It has been agreed that the main cause of halitosis is protein degradation by the bacteria covering oral hard and soft tissues, most commonly the tongue. Putrefaction is the process in which the hydrolysis of proteins, along with the catabolism of resulting amino acids, produces an offensive bad smell from the volatile components. During expiration 96% of humidity occurs in an individual. This humidity develops a precise environment for bacterial growth. Around 500 bacterial species are found in the cavity of mouth. Poor oral hygiene causes the multiplication of these bacterial species especially the Gram-negative species and proteolytic anaerobes leading to increase in halitosis condition. These organisms degrade the organic substrates such as the peptides, glucose, mucin, Proteins present in saliva, crevicular fluid, etc. and produce odorous compounds [19]

➤ Diagnosis and treatment:

Any individual cannot notice the smell of his own breath. Hence, it depends on the other person that he notifies the individual about the foul smell. The diagnostic clinical measurements include organoleptic measurements, microbiological tests, VSCs monitoring, etc. The treatment of halitosis is done by the use of periodontal therapy, approaches that are directed to tongue coating, medical approaches, and the utilization of antimicrobials. Antimicrobial agents have the potential to reduce the bad odor, and masking agents like mouth freshner are used temporarily. For the reduction of oral malodor some of the methods include rinsing with water, sanguinarine rinse, chlorhexidine mouthwash, zinc chloride and essential oil rinses [20]

➤ Mouth Freshners:

Mouth freshner is generally used to avoid the oral malodor as a halitosis masker to get an instant therapeutic effect. It keeps the tooth clean, prevents cancer, enhances oral health, fights against cavities, freshens breath, relieves from cold and cough, helps in reducing body weight and so on. Herbal medicine has significantly impacted the growth of dental treatment in dental fraternity. Some of the commonly used herbs in dental therapy are clove, tea tree oil, coconut water, German chamomile, cranberry, licorice, neem,

morinda citrifolia, *arctium lappa*, evening primrose oil, grape- seed extract, papaine, etc. [21]

➤ **Advantages of Herbal Mouth Freshner Over Synthetic Mouth Freshner:**

Natural ingredients called phytochemicals are present in herbs which show potent antimicrobial and anti-inflammatory effects. They work without alcohol, artificial flavors, colors and preservatives [22].

• **Natural Ingredients:**

Mint, Several Mouth Freshners are formulated by using natural ingredients like cardamom, clove, fennel, etc. which are easily available and provide breath refreshment.

• **No Artificial Chemicals:**

Since Mouth freshners are used for oral hygiene, herbal drugs are the choice because they are free from artificial colors, flavors, and preservatives.

• **Digestive Benefit:**

The majority of herbal ingredients aid in the Digestion process and soothe the stomach after meals.

• **Alleviates Bad Breath:**

Without the use of chemicals, the herbal ingredients neutralize the odor-causing bacteria and provide long-lasting freshness.

• **Pleasant Taste:**

Herbal drugs provide pleasant taste so that one can enjoy the freshness throughout the day.

• **Non Addictive:**

In synthetic Mouth Freshners, there is use of addictive substances like nicotine. Hence, herbal options are safer for regular use.

• **Rich in Essential Oil:**

All herbal drugs contain essential oils that possess potent antibacterial, anti-inflammatory, antifungal, and antimicrobial properties.

• **Economical:**

Availability of herbal mouth freshner is cheaper as we can find them regularly in our kitchen whereas getting assessed to chemical mouth freshner is expensive.

➤ **General Herbal Ingredients used in Mouth Freshner:**

Table 1 Herbal Ingredients used in Mouth Freshners

Serial No:	Ingredients	Botanical Name	Family	Plant Parts Used	Functions
01.	CLOVE	<i>Syzygium aromaticum</i>	<i>Myrtaceae</i>	Full buds	Anti inflammatory
02.	PEPPERMINT	<i>Mentha piperita</i>	<i>Lamiaceae</i>	Fresh leaves	Eliminates anaerobic bacteria
03.	FENNEL	<i>Foeniculum vulgare</i>	<i>Apiaceae</i>	Stalk	Control bad breath
04.	BETEL LEAF	<i>Piper betel</i>	<i>Piperaceae</i>	Leaves	Anticancer, Antimicrobial, Woundhealing
05.	CARDAMOM	<i>Ellettaria cardamomum</i>	<i>Zingiberaceae</i>	Pod seeds	Antimicrobial
06.	POMEGRANATE	<i>Punica granatum</i>	<i>Punicaceae</i>	Seeds	Antioxidants
07.	CILANTRO/CORIANDER	<i>Coriandrum sativum</i>	<i>Apiaceae</i>	Leaves and seeds	Refresh breath, Antiseptic.
08.	SPEARMINT	<i>Mentha spicata</i>	<i>Lamiaceae</i>	Fresh or dried leaves	Antioxidant
09.	MULBERRY	<i>Morus alba</i>	<i>Moraceae</i>	Dried mulberry fruits	Antioxidant, Anti-inflammatory, Anthelmintic, Antipyretic.
10.	BLACKBERRY	<i>Rubus subg rubus</i>	<i>Rosaceae</i>	Fruits and leaves	Sweet and aromatic flavor
11.	CAMPHOR	<i>Cinnamomum camphora</i>	<i>Lauraceae</i>	Oil extract by steam distillation	Antiseptic, Anti-inflammatory, Antifungal, Antipruritic
12.	LEMON	<i>Citrus limon</i>	<i>Rutaceae</i>	Lemon rind	Bad smell refresher
13.	ROSE	<i>Rosa rubiginosa</i>	<i>Rosaceae</i>	Petals	Cures mouth ulcer, cooling effect

14.	LIQUORICE	<i>Glycyrrhiza glabra</i>	<i>Fabaceae / Leguminosae</i>	Unpeeled dried roots and runners	Flavoring agent
15.	TULSI	<i>Ocimum tenuiflorum</i>	<i>Lamiaceae</i>	Leaves	Antimicrobial, antioxidant
16.	BAYBERRY	<i>Myrica pensylvanica/ esculenta</i>	<i>Myricaceae</i>	Leaves and fruits	Astringent
17.	PARSLEY	<i>Petroselinum crispum</i>	<i>Apiaceae</i>	Stems and leaves	Antimicrobial
18.	CINNAMON	<i>Cinnamomum verum</i>	<i>Lauraceae</i>	Bark and leaves	Antibacterial
19.	PISTACHIO	<i>Pistacia vera</i>	<i>Anacardiaceae</i>	Shell covered seeds	Antioxidant, Antimicrobial
20.	GRAPEWINES	<i>Vitis vinifera</i>	<i>Vitaceae</i>	Liquid extract	Antioxidant

➤ *Evaluation Parameters of Mouth Refreshing Spray:*

• *Visual Inspection:*

Visual examination was performed by testing the physical parameters like color and odor.

The appearance of the formulation is evaluated for color, odor, taste, clarity, presence of oil particles, separation of phase etc. The overall performance is rated as positive & negative and then reported [23]

• *Viscosity:*

By using Brookfield's viscometer, the viscosity of the formulation is measured, to determine the flow property, product performance, stability in administration. Viscosity was calculated by measuring the viscosity value on the specified spindle scale of the viscometer [24]

• *Spray Angle:*

The formulation is sprayed from the height of 5cm above white plain paper. The spray angle is measured between the outer border and central rod tip at 4 different points. This average is then concluded as spray angle. The contact angle is a measurable angle of drop of liquid that forms on the surface of the solid. It measures the quantifying property of wettability of a particular material on the solid surface [25]

• *Spray Pattern:*

On a plain white paper, the formulation is sprayed and evaluated the spray pattern as good spray pattern, slightly uneven and uneven spray pattern. The herbal mouth freshner was also evaluated for its spraying pattern by taking a photo with a highspeed camera and the spray angle formed was also measured [26]

• *PH:*

The pH of the herbal mouth freshner is determined by using a pH meter and a beaker containing herbal mouth freshner formulation.

Digital pH meter is used to measure the pH of herbal mouth Freshner. About 1ml of prepared mouth Freshner and standard buffer solution is weighed and 50 ml of distilled water is used to dissolve and the pH is measured [27]

• *In-Vitro Antibacterial Activity:*

Streptococcus mutans colonies is isolated to perform the in vitro evaluation test. The Zone of Inhibition (ZOI) and Minimum Inhibitory Concentrations (MIC) is determined by using agar well diffusion technique. On a prefabricated blood agar plate, the strains of *Streptococcus mutans* is inoculated.

Then the strains are dried and with the help of 6mm agar well cutter 4 wells are made. In each well 6mm of 20 µ ml, 40 µ ml, 60 µ ml, 80 µ ml of prepared mouth Freshner is loaded. It is kept without disturbing so that the culture medium of agar and the mouth freshner undergoes diffusion passively. The plates are incubated at 37degree Celsius and the ZOI is measured and calculated in terms of milli meter. Mean diameter of zone of Inhibition and statistical deviations were calculated [28]

• *Test for Microbial Growth:*

The formulated Mouth freshner was tested for microbial growth by using streak plate agar method. The preparation is inoculated by using streak plate method in the agar plate and also the control sample is also prepared. These inoculated agar plates are incubated at 37°C for 24 hours in an incubator. The microbial growth is checked after taking the plates out and Comparison is done with the control [29]

➤ *Abbreviations:*

GIT- Gastrointestinal tract; MIC-Minimum Inhibitory Concentration; ml- milliliter; mm-millimeter; µ ml-micro milliliter; pH- potential of hydrogen; Q.s-quantity sufficient; VSCS- Volatile sulfur compounds; ZOI- Zone of Inhibition.

III. CONCLUSION

Bad-breath remains a major concern affecting individuals worldwide, leading to social discomfort and anxiety. The use of mouth fresheners, including herbal formulations, serves as an important tool in managing this condition, offering immediate relief and therapeutic benefits.

Throughout history, the use of herbs and spices to combat halitosis. Today, with advancements in medical science, we understand halitosis as a multi-factorial condition stemming from poor oral hygiene, underlying health issues and lifestyle factors such as smoking and diet. Herbal mouth fresheners offer distinct advantages over synthetic alternatives, including natural ingredients devoid of harmful chemicals, digestive benefits, and long-lasting freshness. Utilizing scientific methods to evaluate parameters like visual inspection, viscosity, pH levels, and antibacterial activity of the preparation is essential for ensuring the quality and effectiveness of herbal mouth fresheners. These techniques offer valuable insights into their ability to combat bad-breath and to enhance the complete oral hygiene.

➤ *Conflict of Interest:*

The Author declares no conflict of interest to reveal.

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