REVIEW article

Management of halitosis (bad breath) through the use of common medicinal herbs

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Abstract: Halitosis, another name for bad breath, may be unpleasant and in some situations, even anxiety-inducing. Breath odor is the primary symptom of halitosis, an oral health condition. The first step in treating this avoidable ailment is usually determining the origin of the foul breath. Plant based formulas used in traditional medicine to eliminate odors include echinacea, mint, cloves, coconut, ginger, cinnamon, green tea, black tea, coriander, lemon, thyme, savory, real cardamom, and honey. Physicians who specialize in conventional diagnostic techniques are constantly inspired by the herbs found in nature. The data gathered in this study may serve as a foundation for further research, clinical and experimental, to support the use of natural remedies and medicinal herbs in treating halitosis.

Introduction

The evolution of human civilization has significantly been influenced by the use of medicinal plants [1, 2]. Historically, practically every culture and civilization has relied heavily on medicinal herbs for their medical needs. Many contemporary pharmaceuticals are derived from medicinal plants, which are claimed to be rich in traditional remedies [3, 4]. Medicinal plants have been used to treat illnesses, preserve food, enhance taste, and stop disease outbreaks for thousands of years. These therapeutic plant species have a significantly greater phenolic content, a significant number of flavonoids and flavonols, and antioxidant activity than synthetic antioxidants, which have been proven to cause negative effects including cancer [5-9]. Nowadays, it has been shown that herbal medicines selectively and particularly improve the body's systems without having adverse effects. Traditional herbal treatment has become much more valuable in wealthy countries in recent years [4, 10]. Consequently, the best supplements for oxidative stress-related illnesses are medicinal plants with a high antioxidant capacity [3, 5, 8, 11]. Since oral illnesses are among the most prevalent diseases worldwide and have serious financial and health repercussions, their quality of life is greatly diminished. The most prevalent and dangerous oral diseases worldwide are dental caries (tooth decay), periodontal disease, tooth loss, and cancers of the lips and oral cavity. Oral health issues are a sign of overall well-being since they affect people both emotionally and functionally [12]. The significance of oral problems for children cannot be overstated, as they can impact not only the individual but also the family and the community at large. Conditions that encourage demineralization and re-mineralization in the oral environment might affect the tooth structure. Demineralization proceeds and the tooth structure is damaged if this balance is disturbed [13]. Since the mouth and teeth are among the most polluted parts of the body (**Figure 1**), brushing and using toothpaste to maintain the teeth free of microbial plaque deposition is one of the most effective strategies to treat many related ailments to the teeth, including caries and periodontal diseases [14, 15].

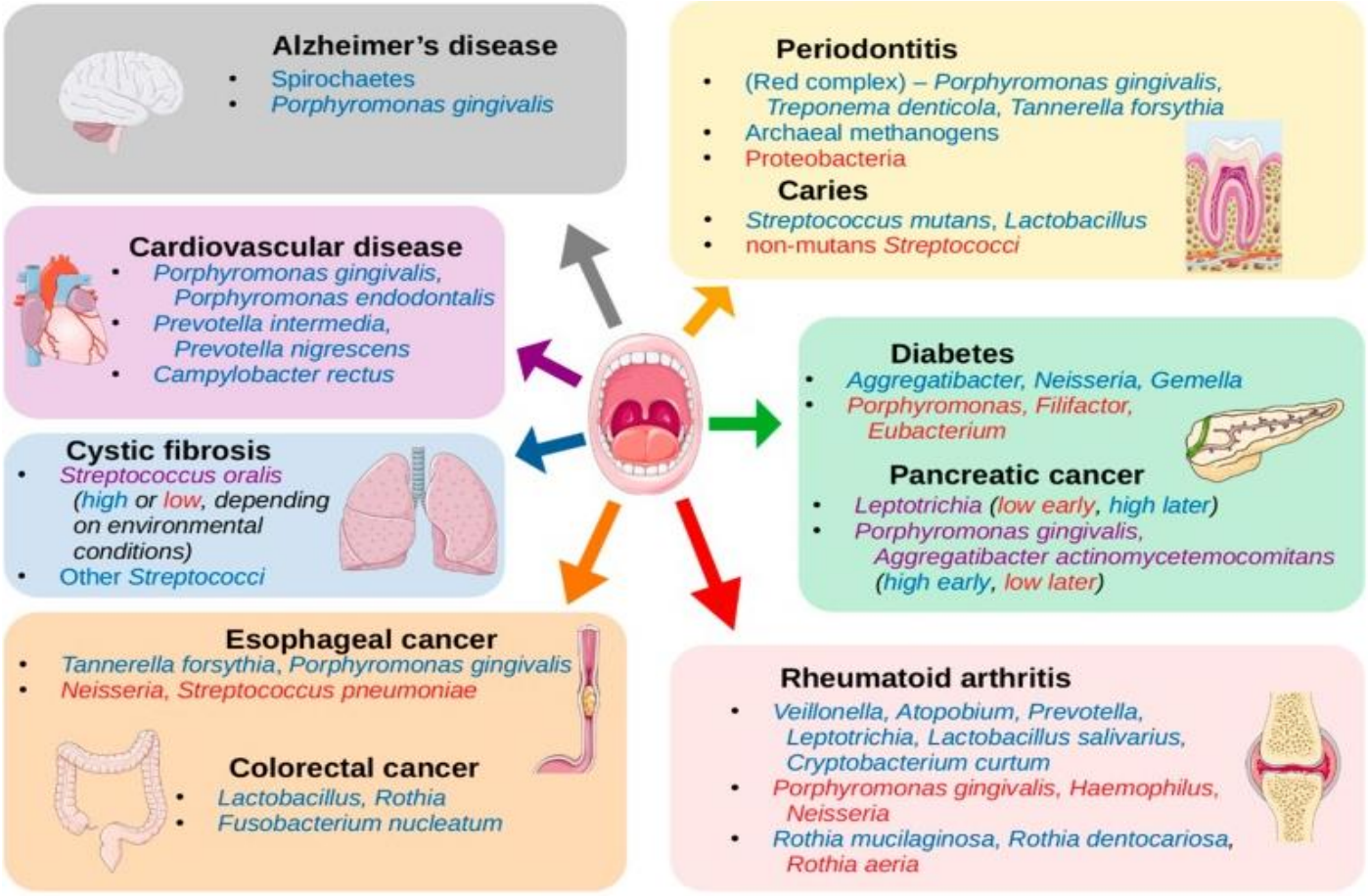

Figure 1: Disorders of the mouth and the body associated with the oral microbiota and bad breath [16].

Halitosis may be eliminated with a variety of pharmaceutical and non-pharmacological therapies, such as using dental floss and other techniques. Additionally, halitosis can be treated with conventional treatment and natural therapies. Nonetheless, halitosis is typically easily treatable, particularly when herbs are used. Plants that are used in traditional medicine to eliminate odors include blueberries, apples, parsley, cloves, coconut, ginger, cinnamon, grapes, green tea, black tea, coriander, lemon, thyme, savory, real cardamom, and marigold. Because of their antibacterial and aromatic ingredients, anti-inflammatory capabilities, ability to correct digestive processes, ability to eradicate ketoacidosis, and other qualities, medicinal herbs also soften the mouth and get rid of halitosis. Herbal mouthwashes that are pleasant to the mouth can be made from aromatic herbs. Halitosis can be eradicated using medicinal herbs. Medicinal herbs are utilized in inexpensive, safe ways to improve overall health and get rid of a variety of dental issues. They work particularly well for halitosis [17]. By lessening dry mouth, medicinal herbs also aid in the eradication of halitosis. The data from this brief study may serve as the foundation for clinical and experimental research aimed at advancing the use of natural remedies and medicinal herbs to treat halitosis.

Symptoms and causes of bad breath: Odor is the primary sign of halitosis. Tooth decay, periodontitis, root infections, food debris, plaque on the tongue, accumulation of intestinal and gastric odour, chronic gastrointestinal diseases like gastritis or constipation, odour from respiratory pathologies like allergic rhinitis, stuffy nose, prolonged sinusitis, or purulent tonsillitis, and unhealthy lifestyle choices like smoking are some of the causes of halitosis. Most individuals believe that plaque and bacteria in the mouth are the cause of their foul breath [18]. A foul-smelling gas is produced in the mouth by bacteria that break down proteins and food particles. Bad breath, plaque feeding, and bacterial formation may be caused by the following [19]. First of all, foul breath, or halitosis, generally happens in the morning. The majority of individuals wake up after a night's sleep with varying degrees of halitosis. Because the mouth remains dry and stagnant all night, this is

natural. The significant increase in saliva flow immediately following breakfast makes this scenario simple to identify. Dry mouth is the cause of the second. Halitosis is linked to dry mouth, which is brought on by a reduction in the salivary flow, which lowers the cleansing mechanism [20]. Sleeping at night is the most frequent reason. Dehydration, adverse drug reactions to some drugs, such as tricyclic antidepressants, or symptoms of other illnesses, including Sjogren's syndrome and difficulties from head radiation therapy, are additional reasons for dry mouth. Food, drink, and medication come in third. Food chemicals can enter the circulation and subsequently reach the lungs. The majority of people are used to the scent of garlic, spicy food, and alcohol on the breath of someone who has just consumed these foods. Breath odor can be caused by a variety of other meals and drugs. Betel, chloral hydrate, dimethyl sulfoxide, disulfiram, and some chemotherapeutic medications including phenothiazines and amphetamines are among the medications that can cause foul breath. Additionally, smoking is a typical cause of bad breath since breathing in smoke causes the odor of our breath to follow. Additionally, smoking raises the chance of gum disease, which is another factor contributing to foul breath. Hunger strikes or diets come up at number four. This is because of a substance called ketones that are created when fat is broken down. Additionally, pregnant women frequently have increased vomiting and gastroesophageal reflux, which raises the acidity of the oral cavity and can result in foul breath [21].

*Conventional way of mouth cleanin*g: The first is brushing immediately after a meal. To help keep the best infections at bay, this is crucial. We should clean our teeth at least twice a day to promote healing after eating for around half an hour. Because brushing alone cannot remove bacterial plaque between teeth, the next step is to use dental floss after eating. The dentist recommends dental floss as one tool for removing plaque between teeth. Cleaning one's tongue is especially crucial since many individuals brush their teeth regularly without realizing that they need also to clean their tongues. The tongue is home to many bacteria and provides an ideal habitat for them to develop. A white tongue is an indication of bacterial overgrowth. To get rid of an unpleasant mouth odour, it is crucial to clean our tongue and mouth. Drinking a lot of water is another strategy since it helps the body retain water, which is beneficial for both health and foul breath. Medical intervention is necessary for people with xerostomia, or persistent dry mouth, in order to manufacture artificial saliva or induce salivation. Additionally, foul breath will become better when we consume a healthy diet. People who have foul breath should consume a lot of fruits and vegetables and stay away from things like garlic, onions, hot spices, caffeine, and sugary meals. Additionally, persons with foul breath should remember to undergo regular dental treatment. Since dental plaque is an excellent way to protect our breath from offensive odors, it should be administered twice a year [22].

Herbal medicinal treatment for halitosis: Recently, there has been more research on the potential of herbal medicine to prevent dental and oral conditions, especially those associated with plaque like caries. The purpose of this review was to examine oral and dental care products that had natural and herbal origins. The phrases "herbal oral care products" were searched for in published research up until 2024 in two databases, PubMed and Google Scholar.

Glycyrrhiza glabra is used in traditional medicine to heal wounds, edema, infections, cancer, and more. The compounds in *Glycyrrhiza glabra* root, which are also present in mouthwash and toothpaste, block the Streptococcus mutations that lead to tooth decay [23].

Since *Ocimum tenuiflorum* leaves are good for mouth ulcers and infections, they may be dried and processed into a powder for toothpaste. It is also effective for eliminating bad breath and massaging the gums. Due to its antibacterial and anti-inflammatory properties, this plant is great for treating gum disease [24]. Turmeric's antibacterial, anti-inflammatory, and antioxidant properties make it suitable for use as mouthwash. In addition, it has antimutagenic and disinfecting properties and protects the liver. The effectiveness of turmeric mouthwash in curing gingivitis has not been significantly different from that of the well-known standard, chlorhexidine. Aside from a brief yellowing of the tongue, this mouthwash has no adverse side effects and a

more pleasant flavour than chlorhexidine mouthwash [25]. According to modern medicine, green tea contains two microelements-potassium and fluoride-that are particularly useful in treating gum disease, preventing tooth decay, and lessening gum odor. We may rapidly eliminate germs and reduce bad breath by making it a habit to drink two to three cups of green tea each day or to remain hydrated with it for fifteen minutes after brushing [26]. In the oral cavity, lemon is the "enemy" of microorganisms. Vitamin C and organic acid, which are found in lemons, have excellent deodorizing and antibacterial properties. We may feel the difference in our breath right away by washing a little piece of fresh lemon peel and then carefully chewing it in our mouth [27]. The Echinacea plant is used as medicine to cure snake bites, coughs, colds, and gum and oral issues. Although its precise mode of action is uncertain, eating this plant has been linked to an increase in phagocytic activity. The chemical components of Echinacea species include flavonoids, water-soluble polysaccharides, lipsophilic parts (like alkamides and polyesthylenes), and derivatives of caffeic acid (like echinacoside, chicory acid, and caffeic acid). Echinacea polysaccharides boost the immune system, while its polyethylenes reduce inflammation [28].

In southern Nigeria, it was traditional practice to clean teeth by chewing the wood of *Cyanopsis tetragonoloba*. These woods include alkaloids, flavonoids, tannins, and saponins. Studies showed that chewing sticks without toothpaste worked very well, and users usually had strong, healthy teeth free of damage and dental plaque. In Ghana and Nigeria, the leaves of this plant were used to alleviate toothaches. This plant's root extract works well for gum swelling, while its leaf extract helps with mouth sores and bleeding gums [29]. The smell of mint is usually pleasant and revitalizing. As a result, many people have found success utilizing peppermint leaves and peppermint oil as a home remedy for halitosis. Chewing mint directly or using it frequently at every meal is the easiest method to treat foul breath. Eugenol, which has antibacterial qualities, is found in cloves and can aid in the removal of mouth odor. Because clove oil kills the germs that cause foul breath, chewing on a few cloves or using it as a mouthwash will temporarily refresh breath. For long-lasting effects, it is essential to continue practicing proper dental hygiene [30]. Due to the antibiotic component, which has a bactericidal action and prevents the growth of certain bacteria in the oral cavity, honey has the unexpected ability to eliminate foul breath. We routinely combine around 20 milliliters of honey with 100 milliliters of warm water, add a few drops of lemon juice, and gargle thoroughly every morning and evening. We will notice a considerable reduction in foul breath if we practice this consistently for around two weeks [31]. A great home cure for foul breath is cinnamon. Cinnamic aldehyde, one of the essential oils it contains, kills microorganisms and masks the odor. You may add cinnamon to tea, chew on a cinnamon stick, or prepare a cinnamon rinse. For a few minutes, dissolve a small bit of cinnamon powder around your tongue after dissolving it in some warm water. For extra advantages, you may also add lemon juice.

Conclusion: Herbal medicine is an effective supplemental or alternative therapy for a variety of conditions. Despite the advent of several modern drugs, the use of herbal medicine is still highly common. For oral conditions such as caries prevention, gingivitis, periodontitis, oral burn, ulcers, inflammation, dry mouth after extraction, pain relief, anesthesia, intracanal medications, poorly fitting dentures, peri-implant mucositis, and peri-implantitis, certain herbal remedies and natural products may serve as an alternative management option to current treatments. Mouthwashes, topical medications, toothpaste, and local drug delivery devices are just a few of its many manifestations.

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