

Herbal mouthwash

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ABSTRACT

Plants and herbs are used to treat diseases globally before the existence of modern clinical drugs. They can be beneficial for the therapeutic purposes and used as precursors in the synthesis of drugs. The importance of mouth and teeth cleanliness has been recognized from the earliest days of civilization to the 21st century. Patients and oral health practitioners are faced with a multitude of mouthwash products containing many different active and inactive ingredients. Current trends have witnessed a popular inclination toward the use of herbal products in the field of medicine and dentistry mainly because they are naturally occurring and have fewer side effects. Herbal mouthwash was recently introduced with the intention of controlling the plaque. Plaque and microorganisms in the mouth are the major contributing factors that induce various orodental infections. Studies prove that herbal extracts are the typical modes of treatment in ancient times when technology and chemicals are still undeveloped. Existing herbal products and extracts such as guava, pomegranate, neem, propolis, tulsi, green tea, cranberry, and grapefruit are likely to be tested as individual and as combination for animal toxicity, anti-microbial activity, dental plaque, and other dental complications. Hence, this multifunctional herbal mouthwash helps to improve the oral hygiene in healthy individuals that prevent any type of orodental complications thereon in near future. This review is an attempt to outline such natural substances, which may be used as effective mouthwashes.

KEY WORDS: Drugs, Herbal, Mouthwash, Plaque, Powder

INTRODUCTION

All that man needs for a healthy living has been provided in nature and it is a challenge for science to find it. For an example, Ayurveda is an ancient healing system that originated in India more than 5000 years ago and relies on herbs for maintaining good health not only branch in dental aspects but also beneficial manifestations on your digestive, circulatory, respiratory, and urogenital systems.^[1] Vedic philosophy believes that human beings are all part of nature, and there is connection between the universe and human beings.^[2] Over 50% of modern drugs nowadays are of natural products origin and as such these natural products play an important role in drug development in the pharmaceutical industry.^[3] In dental sciences, it is believed that dental plaque is the main etiological factor that causes caries, gingivitis, and periodontal disease. Although brushing the teeth

is considered the most effective method of cleaning the teeth and controlling plaque, mouthwash is widely used as adjuncts to toothbrushing and in delivering active agents to the teeth and gums.^[4] Herbal medicine is both promotive and preventive in its approach. It is an extensive system with various remedies derived from plants, herbs, and their extracts to treat orodental infections, disorders and to maintain good health with fewer side effects. Natural herbs such as guava, pomegranate, neem, propolis, tulsi, green tea, cranberry, grapefruit, triphala, jyestiamadh, clove oil, pudina, ajwain, and many more used either as wholly or in combination. These individuals or combined use is scientifically proven to be safe and effective against various oral health problems. For example, research by Bajaj and Tandon shows that Triphala with the effective concentration 0.6% as a mouth rinse is equally effective to prescribed mouthwashes containing chlorhexidine due to its major inhibitory effect in reducing and preventing plaque, gingivitis, *Streptococcus mutans*, and *Lactobacillus* which are the major contributing microorganisms to cause tooth decay and cavities.^[1] Furthermore, herbal

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mouthwash does not contain the two major causative agents such as alcohol or sugar which is found in most of the marketed products as one of the main ingredients in their formulation. These ingredients aggravate by causing the microorganisms to feed on them and eventually leading to orodental complications such as bad breath and halitosis by the release of its byproducts. Thus, by the use of a herbal mouth rinse, we can avoid these ingredients, which itself is one step forward toward better oral hygiene and better health.^[5] Alcohol-free mouthwashes are also known as mouth rinses and tonics that help to maintain the natural balance of saliva by balancing the acidity and alkalinity of enzymes in the oral cavity. This balance is vital for breaking down starches, flushing out bacteria, and to assist in the body's natural digestive process which enhances proper bowel movement eventually. In addition to that, pharmaceutical vehicles such as alcohol dry out the mucous membranes of the mouth exacerbating bleeding in gums and increased sensitivity of tooth and gum which eventually lead to many other oral infections and poor oral state in an individual. Natural mouth rinses containing essential oils, and herbal extracts can provide antimicrobial and connective tissue rebuilding properties, which can substantially strengthen your healing abilities and overall oral health.^[6] Besides that, a variety of oral rinses are available to consumers either by prescription or over the counter (OTC). The increasing popularity of herbal or "natural" products has led companies to include these in their oral care product lines. Since herbal products may be purchased OTC, they have attracted millions of consumers who are looking for an alternative mouthrinse.^[2]

HERBAL MOUTHWASH^[2,4]

Herbal mouthwash is commonly in traditional as well as complementary and alternative medicine which is widely acknowledged due to the extensive use of herbal remedies among the general population in developed and developing countries worldwide such as Ayurveda which has evolved worldwide and commonly practiced by every community.

The materials used are guava, pomegranate, neem, propolis, tulsi, green tea, cranberry, and grapefruit. The following herbs were authenticated, and then, parts of the herbs were used for the extraction to check its active compositions in which are causes of efficiency in dental care of a human being. These active compositions of various herbs are the major constituents of a herbal mouthwash. The powdered herbs (guava, pomegranate, neem, propolis, tulsi, green tea, cranberry, and grapefruit) which were used in the mouthwash formulation were reported to be used widely in oral care formulations.

GUAVA

Guava is commonly seen and grown due to its multiple uses as fruit and as traditional remedies to treat various illness, and research studies have supported this statement by proving that almost all the parts of this plant have medicinal qualities, making it one of the most commonly used therapeutic plants. Leaf decoction or extract can be used mouthwash as it is proven that *Psidium guajava* leaves are commonly used traditionally and alternatively in both conventional and modern management approach of various diseases such as toothache, sore throat, and inflamed gums. Guava comprises bioactive compounds such as saponins, tannins, flavonoids, and alkaloids which are known for their effectiveness in curing orodental complexities such as curing bleeding gums, mouth ulcers, and toothaches.^[7] Guava mouthwash is generally used few times daily as antiseptic and astringent besides killing bacteria and effective in preventing toothaches, heals gum swelling, pyorrhea, bleeding gums, relieves sore throat and mouth sores, reduces pain, and especially causes faster healing of ulcers and can be easily formulated naturally without any side effects.^[8] Guava is commonly known as amrood or bihi in India and grows abundantly in India and thus commonly used as mouth freshener which works exceptionally good and can be used as an alternative to toothpaste or other cosmetic tooth remedy. For an instance, it is a common morning mouth and portable freshener in India whereby it is a potent germs killer besides eliminating bad breath which is the main reason that marketed products start including its raw material in the formulation and development of marketed of products.^[9] Ferdinand *et al.* reported that flavonoids extracted from guava leaves include morin-3-O-lyxoside, morin-3-O-arabinoside, quercetin, and quercetin-3-O-arabinoside exhibits strong antibacterial and antiviral action which also causes significant decrease in the size of aphthous ulcers. Guava leaves mouthwash are much effective for aphthous ulcers in terms of reduction of symptoms of pain and faster reduction of ulcer size compared to the isotonic saline solution, and hence, further clinical trials are encouraged.

POMEGRANATE

Pomegranate or known as *Punica granatum* in Latin is one of the oldest known edible fruits found in the Indus Valley. Pomegranate mouthwash has antibacterial properties in which according to research, pomegranate juice consumption inhibits viral infections while pomegranate extracts have antibacterial effects against dental plaque due to its active components like polyphenolic flavonoids such as punicalagins and ellagic acid. These active components are believed to prevent gingivitis through a number of mechanisms including the reduction of oxidative stress in oral cavity, direct antioxidant

activity anti-inflammatory effects, antibacterial activity, and direct removal of plaque from the teeth which make it the core reason why some new mouthwash and dental-care companies are beginning to look into the pomegranate for its potential use on their mouthwash and other dental products to be marketed. Active compounds in pomegranate possess anti-inflammatory properties that may help soothe irritated tissues, reducing the inflammation caused and has potential to suppress the microorganisms from adhering to the surface of the tooth through chemical interference pathway that leads to the blocking from tissue adherence. In addition to that, there are studies showing that pomegranate extract rinsing also lowered saliva activities of alpha-glucosidase, an enzyme that breaks down sucrose, while it increased the activities of ceruloplasmin, an antioxidant enzyme, exhibiting anticariogenic effect which prevents dental caries in individuals. The seeds and juice are considered a tonic for the heart and throat due to its benefits to function as antibacterial, antioxidant, anti-inflammatory, and strong astringent.^[10] It also maintains a good oral health by killing bacteria, effective in fighting dental plaque and tartar formation, actively removes plaque from the teeth, and finally to reduce the clinical signs of chronic prevents gingivitis and other orodental complications.^[11]

NEEM

Neem is prized for generations as the ultimate Ayurvedic remedy, indigenous to India. In oral health, both oils and aqueous extracts of neem comprise strong antiseptic compounds which destroy the causative bacteria in cavities, halitosis, and gum disease. Neem is known as a powerful antibacterial active ingredient commonly used in toothpaste, mouthwash, and oral health tonics nowadays and a review article by Nishad *et al.* suggested that neem can be used as an alternative to toothpaste among the low socioeconomic status populations as it is economical and cheaper compared to the marketed mouthwash products. Other than that, fewer side effects were observed as lesser recurrence of tooth discoloration or unpleasant taste among the chlorhexidine gluconate mouthwash users.^[12] Microbial analysis proves that 25% neem composed mouthwash plays a significant role in the reduction of common microbial flora which is considered as major cause for dental caries and periodontal diseases which also contributes hugely as dental carries leads to tooth extraction eventually which affects children mainly. The overall prevalence of dental caries was 73.3% among the total number of children examined for the present study, and among 6–9 years old, the prevalence of caries was 77.8%, whereas among 10–12 years old, it was approximately 68% and according to the World Dental Federation, oral health goals to be achieved by the year 2000 reported that the prevalence of caries in

5–6 years old should be <50% whereby in reality, the target is nowhere to be reached.

PROPOLIS

Propolis is a complex, natural substance produced by honey bees. It contains minerals, vitamins, and organic acids, and important flavonoids comprise hard resinous substance consisting chiefly of wax and plant extracts. The major constituents of propolis are flavones, flavanones, and flavanols which contribute to its homeopathic use and herbal practice as an antiseptic, anti-inflammatory, antimycotic, and bacteriostatic agent. Propolis possesses antimicrobial activity against *S. mutans*, commonly found in the human oral cavity and contributes significantly to tooth decay and to prevent dental caries which supports the fact that propolis mouthwash has important antibacterial properties which are essential to help maintain a healthy mouth. Propolis mouthwash is perfect for treating gingivitis, bleeding gums, gum disease, bad breath, sore throat, and thrush and is usually recommended for daily use to freshen breathe and to maintain mouth hygiene.^[13] In addition to that, propolis can also be used to treat cancer sores and tumorous cells due to its strong, anti-infective activity which is also the reason that it is the alternative measure to prevent periodontal and gingival problems.

TULSI

Ocimum sanctum is known as holy basil which is a common aromatic plant in the family Labiatae and represented by nine species of *Ocimum*, whereby *O. sanctum* is most prevalent in India. Holy basil leaves contain 0.7% volatile oil that constitutes approximately about 71% eugenol and 20% methyl eugenol while the oil approximately constitutes carvacrol and sesquiterpene hydrocarbon caryophyllene. Fresh leaves and stem of holy basil extract yielded some phenolic compounds (antioxidants) such as cirsilineol, circimaritin, isothymusin, apigenin, rosameric acid, and appreciable quantities of eugenol, and all these active compounds are known for its anti-inflammatory action, bacteriostatic effect, antioxidant, and immune modulatory properties and therefore used as a therapeutic agent for gingival and periodontal disease. Tulsi is known as the most sacred herbs found in India and found in almost every Indian household. Tulsi has been used in India for around 5000 years and is known for its healing properties of the mind, body, and spirit in every individual and extensively used from ancient times and still practiced till today. The parts of tulsi generally used are its leaves, seeds, and dried roots.^[14] Tulsi is used as mouthwash for reducing toothache. Its leaves on the other hand can be dried under the sun, powdered, and bottled up to be used for brushing teeth as an alternative to chemically

derived toothpaste. Another review article also suggested that dried tulsi powder can be mixed with mustard oil to make a fine paste and used as toothpaste which is effective in maintaining good dental health, counteracting bad breath and for massaging the gums, used to treat pyorrhea and other teeth disorders. Tulsi makes an exceptionally good mouth freshener and oral disinfectant where its freshness lasts long in the mouth with zero mouth odor. Holy basil destroys most of the microorganisms and bacteria in the mouth besides curing ulcer in the mouth, and on the other hand, inhibitory effect against the growth of cancerous cells and tumors in oral cavity is prevented by chewing tobacco.^[15] Traditional remedy suggested by ancestors is that water boiled with basil leaves can be taken as a drink or gargled to soothe and cure sore throat. Tulsi is an important ingredient in the preparation of cough syrups and expectorant even in modern days as numerous marketed products have included its raw material in either individual or combined use.^[16] Antibacterial benefits of tulsi leaf extract against *S. mutans* a Gram-positive bacteria commonly found in the oral cavity and significantly contributes to dental cavities effectiveness compatible as other mouthwashes such as Listerine and Chlorhexidine for inhibiting the bacteria.^[17]

GREEN TEA

Tea originates from the leaves of the plant known as *Camellia sinensis* in Latin and has undergone minimal oxidation during processing and contains compounds that appear to control inflammation and fight bacterial infection. Green tea is known to be rich in antioxidants, with numerous health benefits which functions in the prevention of cavity infection as green tea controls bacteria and lowers the acidity of saliva and dental plaque. Hence, green tea may be a useful tool in preventing cavities. Next benefit is to maintain gums' health as the green tea's anti-inflammatory powers seem to help control periodontal (gum) disease. Besides that, lesser tooth extractions will be needed as the active compounds will play its role to prevent cavities and gum disease. The most abundant components in green tea are polyphenols, in particular, flavonoids such as the catechins with subgroups such as epicatechin gallate, epicatechin, epigallocatechin (EGC), and EGC gallate which are the causative agents that slow the progression of oral cancer. Essential antioxidants such as catechins which comprise approximately more than 50% in the green tea which appear to protect against cellular damage and cancerous tumor growth by neutralizing free radicals that damage cell structures and lead to tumorous cells and also other diseases. Jenabian *et al.* supported the daily consumption of green tea mouthwash to prevent as well as cure the gingival inflammation existing among patients. Green tea also eliminates mouth odor

and bad breath by killing the microbes that cause mouths to stink.^[18]

CRANBERRY

Cranberries known as *Vaccinium macrocarpon* in Latin are a shrub that grows in Northeastern North America sold as fresh produce, dried fruit, juice, and encapsulated powders. Furthermore, Cranberry extracts are rich in polyphenols, mainly flavonoid known to exhibit antibacterial properties, and researches have shown that they may help control the growth of *Escherichia coli*, Proteus bacteria, and *Helicobacter pylori* which is a type of bacteria causing peptic ulcers and stomach cancer. Besides that, researches and various journal articles prove that cranberries may exhibit antiviral and antifungals properties as cranberry fights microorganisms, and thus, it has been suggested to be used as a mouthwash. Sugar-free variety derived cranberry juice is preferred for gargling due to high amount of sugar which deteriorates the well-being of the oral cavity by promoting tooth decay.^[19]

GRAPEFRUIT

Grapefruit seed extract is obtained from the seeds and dried pulp. It is a rich source of bioflavonoids and Vitamin C and E. Grapefruit works as an excellent antiseptic mouthwash that keeps harmful microorganisms in the mouth under check. It is specifically useful in treating gingivitis.^[20] Grapefruit seed extract has several antimicrobial properties which help in maintaining oral health. Excessive Vitamin C found in grapefruit seed extract that helps to fight various infections. Hence, grapefruit seed extract is useful to maintain oral health.^[21]

CONCLUSION

To sum up, today dentists are practicing in an era where the patients are more concerned about both their oral health and their overall medical well-being. Thus, in the midst of growing evidence of the connection between oral health and whole body health, herbal medicines with their "naturally occurring" active ingredients or composition used in the formulation of the mouthwash enhances a gentle and enduring way in the attempt of health restoration of perfect fit by the most trustworthy and least harmful way.

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