

## A REVIEW ON VARIOUS HERBAL DENTAL AGENTS

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**ABSTRACT**

In the current work, herbal substances that are accessible, affordable, and effective are being incorporated into Personal hygiene products. Psidium Guajava a member of the Myrtaceae (Guava) family, has several antibacterial, Anti-cancer, anti-diabetic, and antioxidant properties in its leaves. Guava leaf extract has long been utilized for its therapeutic properties. The primary goal of this research is to use the herbal component to create toothpaste that can efficiently remove oral germs. The developed toothpaste underwent evaluation in compliance with bureau of Indian standards specification. It was discovered that the antibacterial qualities of the tested toothpaste were effective. oral hygiene is one of the most crucial needs for humans as well as in a person's daily life oral hygiene comes first. The primary goal of the research is to use the herbal component of the toothpaste that can essentially remove oral germs.

**KEYWORD:** Oral hygiene, Anti-microbial activity, Ayurvedic, Plaque, Toothpaste.**INTRODUCTION****Tooth**

Our teeth are part of our digestive system. They break down foods by Crushing or cutting them before you swallow. Most humans have 32 Teeth, although some have more and some have fewer. Enamel (the Protective outer layer of your teeth) is the hardest substance in the Human body.

Brushing after meals, using antimicrobial mouthwash, and flossing at Least once per day helps to keep these disease causing bacteria from Reproducing in your mouth, and causing tooth decay. And, healthy diets That minimize sugary and starchy foods also helps to keep those bad Bacterial under control.

**Toothpaste**

To maintain and enhance oral health and appearance, toothpaste is a paste or gel that is used in conjunction with a toothbrush. Since toothpaste was first used thousands of years ago, formulas have changed significantly. From simple formulations that included ashes or crushed egg shells as a suspension to intricate formulas that frequently contained more than 20 ingredients, Compounds to treat dental caries, gum disease, odor, calculus, erosion, and dentin hypersensitivity may be among them. In addition, toothpastes have flavors to freshen breath, dyes for improved aesthetic appeal, and abrasives to clean and whiten teeth. Toothpaste that is designed to maximize the bioavailability of its active ingredients is considered

effective. However, when multiple different actives are formulated in one phase, compromises will need to be made, which can make the process difficult. The development of toothpaste is far from finished since there are still many obstacles to be addressed, chief among them being the poor oral substantivity of the majority of active ingredients.<sup>[1]</sup>

**Why using herbal toothpaste is preferable to regular toothpaste**

The use of herbal products is becoming more popular these days. Herbal toothpastes are just as good as non-herbal toothpastes at preventing plaque and gingivitis, and they don't cause any negative side effects when used. They can also be used in place of conventional (non-herbal) toothpaste, so people can choose between natural (herbal) and conventional (non-herbal) toothpaste. Antimicrobials were added to dentifrices in order to increase their effectiveness in controlling microorganisms. 6,7 Dentifrices are a daily, practical, and preventive tool for maintaining good oral hygiene that prevents oral diseases by limiting the development and growth of plaque.

There has been a recent increase in interest in herbal toothpaste. 7 The primary ingredients of herbal toothpaste include herbs with long-standing medical applications, such as myrrh, which aids in the destruction of microorganisms that contribute to plaque formation; chamomile and sage, which reduce inflammation and gum bleeding; and echinacea, which boosts the body's

defense mechanisms. Added essential oils provide flavor and ease pain. Additional ingredients include cloves, tea tree oil, coriander, lemon, and spearmint. 8 This review is conducted to evaluate and compare the efficaciousness of herbal and non-herbal toothpastes in reducing dental plaque and gingivitis.<sup>[2]</sup>

### IDEAL FEATURES

1. Strong abrasive action
2. Non-toxic and non-irritating
3. Effect: No tooth stains
4. Maintain a clean and fresh tongue.<sup>[3]</sup>

### Anti-Bacterial Activity Of Psidiumguajava

**Gava leaves** (as in fig. no 1)

**Synonyms:** Guava Bush and Strawberry Guava

**Biological Source:** The little medicinal tree Psidium guajava L. Is a South American native.

**Family:** Myrtaceae

### Chemical Constituent

The primary phenolic chemicals found in guava leaves include

1. Isoflavonoid,
2. Gallic acid,
3. Catechin,
4. Epicatechin,
5. Rutin,
6. Naringenin.

### Uses

It is used to treat inflammation.

Fever, diarrhea, lung disease, and ulcers are all treated with it.

Helps one lose weight.

Helps to manage blood sugar levels.

Enhances the texture of your skin.

The method of well diffusion used to determine the level of bacterial activity in toothpaste is Using Mueller-Hinton 2nd plants, the antibacterial Activity of plant extract was tested in accordance with the national committee for clinical laboratory standards. A sterile cotton swab was dipped into the suspensions using sterile forces, rotated several times, and removed from excess inoculums by processing the swab firmly above the suspensions. The test bacteria were then inoculated into all of the places that had initially been streaked with bacteria. Liquid flow rate into the tube.

The surface of the again plate was rotated to ensure an equal distribution of inoculums presents 4 Around the rim fifty text extract aliquots were dispensed into each well present in the plates after in occultation with bacteria. The plates are dried for 3 to 5 min to remove excess moisture present in it Triangle shaped well were prepared with a distances of 2 inches apart the same extract was Incorpororant into three plates for each selected bacteria strain controls were prepared with pure Solvents for each bacterium the plates are wrapped with

parafilm labelled and stored in an Incubator at 37c. Each plate was examined after incubation for 24 hrs identified inhibition zones Measured (in millimeter) with a rules experimental results were noted in parallel and took the Average results of three independents experimental results initially the binder is mixed with solid Abrasive then it is added to liquid phase contains sweetener humectants and preservative into a Mixer as a results homogenous paste was formed then added the detergent and flavor mixed Vigorously finally deaerated and tubed.<sup>[4]</sup>

### Material and Formulation Table of Toothpaste

#### NEEM (as in fig. no 2)

A indica seed kernels contain nimbidin, a significant chemical with a variety of pharmacological effects. Nimbidic acid, nimbolide, nimbin, nimbinin, and nimbidinin are among the several physiologically active substances found in nimbidin. Neem dental care products contain neem leaf or bark extract. The antioxidant component of neem leaf enhances the immune response in the oral and gum tissues. Neem works well as an analgesic for toothaches and as a cure for mouth ulcers and tooth decay.<sup>[5]</sup>

#### Tulsi (as in fig. no 3)

Tulsi has been shown by some writers to be effective when used as an intracanal irrigant for primary molars at a concentration of 4%. The antibacterial activity is attributed to the active ingredient, eugenol, according to the text. Consequently, tulsi can be used safely even at higher doses than sodium hypochlorite because of its adverse effects on developing tooth buds, burning sensation in the tissues, and unintended allergic reactions.<sup>[6]</sup>

#### Pudina (as in fig. no 4)

*Mentha arvensis*, also known as pudina, is a widely used flavoring agent in vinegar, teas, tobacco, fish, meat, fish sauces, soups, ice creams, stews, and cordials. Since ancient times, it has also been used as a medicinal plant to treat a variety of illnesses.  $\alpha$ -menthol, neomenthol, isomenthol, d-menthone, isomenthone, menthofuran, menthylacetate, carvomenthone, cineol, p-cymene, aromadendrene, limonine, -phellandrene, pipertone, -pinene, carvacrol,  $\alpha$ -pinene,  $\alpha$ -phellandrene, -pinene, dipentene, cardinene, thujone, and many more chemical components are found in *Mentha arvensis*. The most widely used ingredient in *Mentha arvensis* is menthol. Menthol is a crystalline, waxy substance used in many medical applications.<sup>[7]</sup>

#### Ginger (as in fig. no 5)

The immense phytotherapeutic properties of ginger make it a potentially useful herb used globally. Utilizing this herb enhances bodily processes and aids in the removal of toxins from the body; in Ayurveda, it is referred to as Mahaushdi (Nadkarni, 1976). Recent studies have demonstrated the wide range of medicinal benefits that ginger can provide, including direct anti-inflammatory

effects, antimicrobial, antioxidant, and antibiotic effects. It can also prevent the synthesis of inflammatory compounds. In addition, studies have shown that ginger can effectively treat certain types of cancer, promote blood flow, manage hypertension and blood pressure, lower cholesterol, and help prevent heart issues.<sup>[8]</sup>

#### **Clove (as in fig. no 6)**

Clove oil contains 60–90% eugenol, 10% acetyl eugenol, and trace amounts of flavonoids, gallic acid, sesquiterpenes, furfural, and vanillin. Clove is frequently used in dentistry as an obturating material for primary teeth and as an interim therapeutic restoration because it not only has a strong radical scavenging action but also inhibits the formation of germ tubes by *C. albicans*. Eugenol suppresses prostaglandin-mediated inflammation, which has a depressant effect on sensory nerves and is known as the "obtundent effect."<sup>[9]</sup>

#### **Green Tea**

Green tea has anticariogenic properties because of polyphenols like tannins, flavan-3-ols, EGCG, and fluoride. These compounds disrupt cell membranes, stop DNA from supercoiling, inhibit the enolase enzyme, which in turn inhibits glucosyltransferase activity, and prevent adherence to the tooth surface. Catechins reduce the production of proinflammatory mediators and inhibit the periodontopathic pathogens' collagenase, protease, and tyrosine phosphatase activity, which prevents the disruption and degradation of the collagen in gingival tissues. In comparison to children's mouthwashes containing 0.05% sodium fluoride and 0.2% chlorhexidine gluconate, the 0.5% green tea extract exhibited the highest antiplaque activity. Research has demonstrated that mouthwashes containing green tea, which have the added benefit of being natural, can be used as a substitute for mouthwashes containing chlorhexidine in maintaining dental hygiene.<sup>[10]</sup>

#### **Cinnamon**

Cinnamaldehyde, eugenol, phenol, and linalool are the primary constituents of over 80 compounds that have been identified. After using a mouthwash and spray containing *Cinnamomum zeylanicum* (*C. zeylanicum*) for fifteen days, the amount of *Candida* species in vivo decreased by 61% and 33%, respectively.<sup>[11]</sup>

#### **Myrrh**

It is a well-known traditional Arabic herbal remedy that has been used for ages to treat a variety of inflammatory conditions. It is composed of gum, resin, and volatile oil. Myrrh oil, tincture, and 1% mouthwash have all been shown in clinical trials to significantly lower plaque levels and gingival inflammation. Myrrh is useful in the treatment of viral disorders like aphthous ulcers because it stimulates the maturation and activation of white blood cells, dermal fibroblast proliferation, and an increase in the production of collagen III mRNA.<sup>[12]</sup>

#### **Babool**

Bamboo (*Acacia nilotica*) Numerous organic and inorganic components can be found in abundance in this plant. *Acacia Nilotica* (*A. nilotica*) has primarily demonstrated antibacterial (*S. mutans*, *S. aureus*, and *S. viridans*) and antifungal (*Candida albicans*, *C. albicans*) activity in the field of dentistry, with reported MICs of 35 and 50 mg/mL and bactericidal activity in the range of 35 and 60 mg/ML.<sup>[13]</sup> Although there is little information available about the use of *A. nilotica*, in-vitro studies have demonstrated promising outcomes when it comes to disinfecting gutta percha cones and using it as an efficient root canal irrigating solution.<sup>[14,15]</sup>

#### **Withania somnifera (Ashwagandha)**

This plant, which belongs to the Solanaceae family, is widely used in traditional Indian and Nepalese medicine as a general tonic for longevity and general health, as well as a remedy for a variety of ailments. Ashwagandha reduces the formation of biofilm and enhances the diffusion of calcium hydroxide through dentinal tubules when applied to oral rinses, making it a viable substitute for administering intracanal medication.<sup>[16]</sup>

#### **Haldi**

The group of substances that make up turmeric is known as curcuminoids, and the most active of these is the polyphenol curcumin. Turmeric has been used in dentistry to make it simple to identify pit and fissure sealants and dental plaque. As an intracanal medication, it is utilized because of its capacity to inhibit *S. mutans* and *E. faecalis*. *Curcuma longa* (*C. longa*) has been used as a mouthwash, 2% topical gel, or 1% subgingival irrigant because sesquiterpenes are the compounds responsible for the anti-inflammatory action. It has been found that turmeric chips work just as well as chlorhexidine for treating gingival and periodontal conditions. It is a useful substitute for treating dry sockets due to its analgesic and wound-healing qualities.<sup>[17]</sup>

#### **Triphala**

Triphaly The term "triphala" refers to a combination of three fruits, namely *Embolica officinalis*, *Terminalia chebula*, and *Terminalia bellerica*. Rich in antioxidant, immunomodulatory, antimicrobial, and antiaging properties, triphala is also high in tannins, carotene, vitamin C, and anthraquinones. There are two ways to prepare triphala: either in a 1:1:1 ratio with all three fruits or in a 1:2:4 ratio with *T. bellerica*, *T. chebula*, and *E. officinalis*, in that order.<sup>[18]</sup> Oral streptococci counts have been shown to decrease with twice-daily use of a mouth rinse containing 6% Triphala for seven days, which is more significant than 0.2% chlorhexidine.<sup>[19]</sup> Owing to its antimicrobial characteristics, it presents a viable substitute for traditional root canal irrigation.<sup>[20]</sup>

#### **Myrrh**

Myrrh, or *Commiphora molm*, is a well-known traditional Arabic herbal remedy that has long been used

to treat a variety of inflammatory conditions. It is composed of gum, resin, and volatile oil. Plaque levels and gingival inflammation have been shown to significantly decrease in clinical trials utilizing myrrh oil, tincture, and 1% mouthwash.<sup>[21]</sup> Myrrh has the ability to heal because it stimulates the maturation and activation of white blood cells, dermal fibroblast proliferation, and an increase in the production of collagen III mRNA. As a result, it is useful in the treatment of viral disorders like aphthous ulcers.<sup>[22]</sup>

### **Camellia sinensis (Green tea)**

Green tea has anticariogenic properties because of polyphenols like tannins, flavan-3-ols, EGCG, and fluoride. These compounds disrupt cell membranes, stop DNA from supercoiling, inhibit the enolase enzyme, which in turn inhibits glucosyltransferase activity, and prevent adherence to the tooth surface. Catechins reduce the production of proinflammatory mediators and inhibit the periodontopathic pathogens' collagenase, protease, and tyrosine phosphatase activity, which prevents the disruption and degradation of the collagen in gingival tissues. When children's mouthwashes containing 0.2% chlorhexidine gluconate and 0.05% sodium fluoride were compared, the 0.5% green tea extract demonstrated the strongest antiplaque activity. Research indicates that mouthwashes containing green tea, which have the added benefit of being natural, can be a viable substitute for mouthwashes containing chlorhexidine when it comes to maintaining dental hygiene.<sup>[23]</sup>

## **CLINICAL RELEVANCE**

### **Therapeutic uses of herbals as dental agents**

As an antibacterial, antioxidant, and painkiller, herbal medicine has been successfully used in dentistry. Natural phytochemicals function as an alternative to antibiotics and help heal oral infections, boosting immunity in the process.

### **Principal findings**

For a period of 28 days, brushing your teeth regularly with the ayurvedic Supirivicky toothpaste greatly reduced the clinical symptoms of chronic gingival inflammation, but not significantly more so than when using a regular, non-herbal toothpaste.

### **Practical Implications**

Unsupervised brushing with the ayurvedic Supirivicky toothpaste does not significantly reduce gingivitis compared to brushing with a regular, non-herbal toothpaste.

## **CONCLUSION**

The dental paste preparations of herbal toothpaste designed using different bases for treatment of gingivitis, periodontitis and dental plaque. During our Physicochemical evaluation studies all the formulations were found to have PH, good tube extrudability, good Spreadability and viscosity characteristics. the goal was to use herbal antibacterial agents rather than chemical

ones, and it was Successful. The toothpaste that was produced as a result passed all of the evaluation tests. We will surely think Differently about herbal components as a result of this research. Such studies will influence how people view herbal Toothpaste and other personal care items.

Following conclusion can be drawn from the results Obtained in the present work of investigation. This herbal Toothpaste is having prominent function in the Maintaining the oral hygiene and preventing dental Caries and are safer with minimum side effect than Chemical based synthetic toothpaste. All the marketed Herbal toothpaste and lab-made had been evaluated and Compared with the standards specified by Bureau of Indian standards. Formulated toothpaste is capable to Maintain the tooth and oral hygiene and shows Antimicrobial activity against microbes like E. coli.

Evaluation and comparison of results with commercial Herbal toothpaste are demonstrated that formulated Herbal toothpaste is having equal helpful and fascinating Over the marketed formulations (Colgate Vedshakti, Dabur Meswak, Patanjali Dantkanti and Dabur red). This Preliminary in-vitro study demonstrated that Herbal Toothpaste was equally efficacious as marketed popular Toothpastes in terms of all evaluation properties of Toothpaste.

The formulated herbal toothpaste has good Scope in the future by increasing natural ingredients for Manufacturing more and safer natural remedies, in the Research and health of dental care of public, society and Nation.

It is concluded that Herbal Toothpaste was found to be of good quality.

### **GAVA LEAVES** (as shown in fig no 1)

Kumar, Manoj, et al. "Guava (*Psidium guajava* L.) leaves: Nutritional composition, phytochemical profile, and health-promoting bioactivities." *Foods* 10.4 (2021): 752.

### **NEEM** (as shown in fig no 2)

Naveed, Niha, et al. "The use of neem in oral health." *Research Journal of Pharmacy and Technology* 7.9 (2014): 1060-1064.

### **TULSI** (as shown in fig no 3)

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### **PUDINA** (as shown in fig no 4)

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**CLOVE** (as shown in fig no 6)

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