

NUTRITIOUS MOUTHWASH USING EGG SHELLS AND MEDICINAL PLANT EXTRACTS

Abstract

Mouth infections, also referred to as oral infections, encompass a range of infections that occur in the vicinity of the oral cavity. These infections consist of dental infection, dental abscess, and gingivitis. Generally, mouth infections originate from dental caries located at the root of molars and premolars, which then extend to nearby structures. Due to these conditions, the mouth infections are commonly treated by surgical incision and drainage. However, new ways of treatments which serve in an organic manner and provide rapid relief with the combination of medicinal extracts and eggshells for the calcium content. In order to get rid of high dosage drugs and surgeries, this mouthwash will be a best solution for instant relief.

Keywords: Oral Infections, Organic Treatment, Mouth Wash, Medicinal Plants, Egg Shells.

Authors

Durai Singh Carmelin

Department of Microbiology
Dr. ALM PG Institute of Basic Medical Sciences
University of Madras
Taramani Campus, Chennai.

Nanthini Rengachari

Department of Microbiology
Dr. ALM PG Institute of Basic Medical Sciences
University of Madras
Taramani Campus, Chennai.

Karthick Shanmugam

Department of Microbiology
Dr. ALM PG Institute of Basic Medical Sciences
University of Madras
Taramani Campus, Chennai.

I. INTRODUCTION

In the total population density, mass people were affected by gingivitis and periodontitis like oral infections. They have aspects of poor hygiene, comprehensive systemic conditions, pregnancy, and puberty contributing to their development. By removing plaque and calculus using mechanical cleansing, purging, sanitizing and scaling is the gold standard treatment for gingivitis and periodontitis. Since our ancient era, variety of herbal products, regenerative materials and local drug delivery agents were used for scaling to enhance the conditions of oral cavities (1).

II. MOUTH WASH

Gargling fluid typically known as mouthwashes are aqueous components that avert, alleviate and cure some dental conditions like dental caries, erosion, and gum infection. It will help to control oral health by dint of diminishing oral microbiota. A classic mouthwash contains sweetener (saccharin), surfactant (PEG-40 hydrogenated castor oil), preservative (sodium benzoate), colorant, and flavouring agent mixture. And also, it contains some anticaries compounds and antimicrobial drugs (essential oils) (2).

III. EGG SHELL

Egg shells are a repository of minerals, exceptionally calcium. It can be reformed into an absorbable calcium inception for fortification of food products and other applications such as pharmaceuticals and agriculture. Eggshell powder comprises 40% of calcium in weight. It is tasteless, insoluble and also non-irritating. It is able to react with gastric acid (HCl) and perform as an antacid, making it a viable source of calcium in the human intestine. The bioactive mechanism establishes better absorption of calcium in the human intestine.

IV. MEDICINAL PLANTS

- 1. Manila Tamarind (*Pithecellobium Dulce*):** *Pithecellobium dulce* bark and pulp were the classical amend such as toothaches, gum malady and haemorrhage. Some previous studies show that, it has anti-oxidant, anti-inflammatory, anti-diabetic, and anti-tumour properties. So, it provides pain relief, eczema, fever, cold, sore throat, pigmentation, acne, and pimples.
- 2. Noni (*Morinda Tinctorial*):** Noni (*Morinda tinctorial*) juice, an imperative herb which contains multitudinous medicinal properties. It was identified for a potential implicit to sodium hypochlorite solution, and gold standard endodontic irrigant. In recent times only these Noni plants were involved in the dentistry fields. This Noni juice is a combat for dental caries, which is caused by acid producing and acid resistant bacteria like *Streptococcus mutans*, *Lactobacillus sps*, which turns around the environment to acid condition. It leads to dissolve the calcium phosphate widely present in the teeth, and finally directs to dental caries (1). These Noni extracts are very effective against oral *Streptococcus sps* owing to their antibacterial properties. Ripe noni fruits extracts are used as mouth rinses due to their antibacterial and anti-inflammatory properties after the mechanical debridement.

3. **Guava Leaves (*Psidium Guajava*):** Guava (*Psidium guajava*) leaf extract contains flavonoids, including quercetin, which is the predominant flavonoid. Bioactive polyphenolic compounds, such as quercetin and ferulic, caffeic, and gallic acids, are present in guava leaves, determining their antibacterial and therapeutic properties. These secondary metabolites exhibit strong antioxidant and immunostimulant activities (4).
4. **Veldt Grape (*Cissus Quadrangularis*):** *Cissus quadrangularis* has anti-inflammatory properties due to its bioflavonoids, flavanoids, flavones, flavonols, flavanols, and flavanoids, including luteolin. These compounds inhibit the lipoxygenase pathway, acting as a dual inhibitor of arachidonic acid metabolism. β sitosterol, also known as plant cholesterol, also exhibits anti-inflammatory properties (5).
5. **Licorice Root (*Glycyrrhiza Glabra*):** Licorice (*Glycyrrhiza glabra*) has so many bioactive ingredients like glycyrrhizin, glabridin, licochalcone A, licoricidin, and licorisoflavan. It has significant benefits in oral diseases like dental caries, periodontitis, candidiasis, and recurrent aphthous ulcers. Licorice root acts as anaerobic periodontal pathogens, and in vivo efficacy of licorice and chlorhexidine mouth rinses is comparable. No significant difference in efficacy was observed between the two (6).
6. **Eucalyptus:** Eucalyptus oil contains medicinally and pharmacologically dominant chemicals, that used in various medicine aspects for its anti-inflammatory, antimicrobial, antioxidant, antihistaminic, and antiseptic properties (7). For these properties eucalyptus oil was used in the dentistry field.
7. **Betel Leaves (*Piper Betle*):** Betel leaves (*Piper betel*) leaves consist of steroids, alkaloids, polyphenols, and tannins components. These are chemo-preventive and implicit against carcinoma and liver fibrosis conditions. These are also very rich in nutrients, vitamins, minerals, enzymes, and essential amino acids. Typically chewing betel leaves which can reduces oral microbial flora by 56%, recuperating bad breath and also avert from decaying of tooth. It has wide-spectrum of antibacterial activity against diverse bacteria strains such as, *Staphylococcus aureus*, *Bacillus cereus*, *Pseudomonas aeruginosa*, and *Escherichia coli* (8).
8. **Corn Silk (*Stigma Maydis*):** Corn silks (*Stigma maydis*) contain phytochemical components such as, flavonoids, sterols, alkaloids, and polysaccharides, organic acids, trace elements, multivitamins. It also has antioxidants properties which scavenging the free radicals, anti-bacterial activities and regulates the lipid level in blood (9).
9. **Mint (*Mentha longifolia*):** Mint (*Mentha longifolia*) is widely used for treating throat irritation, mouth soreness, and throat infections due to its antimicrobial properties. Oxygenated monoterpenes in its chemical composition make it effective against various bacteria. The essential oil of *Mentha longifolia* has antibacterial properties against *Escherichia coli*, *Salmonella typhimurium*, *Listeria monocytogenes*, and *Pseudomonas aeruginosa* and also antifungal properties *Aspergillus flavus*, *Botrytis cinerea*, *Fusarium oxysporum*, *Aspergillus niger*, *Trichophyton longifusus*, *Microsporm canis*, and *Mucor ramamnianus*. The methanol extract has a better antioxidant effect due to its phenolic compounds (10).

10. Clove (*Syzygium Aromaticum*): Clove (*Syzygium aromaticum*) has high dentistry benefits than other medicinal plants. It acts as analgesic in dental problems. Clove oil, derived from *Syzygium aromaticum*. It has high potential antioxidant and antimicrobial activity in contrast to many fruits and vegetables. It is used for treating toothaches, dental caries, and pyorrhea. Eugenol, a constituent of clove oil, has anti-inflammatory, antipyretic, and antifungal properties. It is suitable for aquacultural, and fisheries. It is used for various health disorders, including toothaches (11).

V. COMPOSITION OF MEDICINAL MOUTHWASH

Components	Uses
Egg shells	Source of calcium citrate
<i>Pithecellobium dulce</i> (Madras thorn)	Reduce bleeding gums, anti-inflammatory, Rich source of calcium.
<i>Morinda tinctoria</i> (Indian mulberry)	Wound healing activity, cures bleeding gums.
Guava leaves (<i>Pisidium guajava</i>)	Antibacterial, cures halitosis, Anti-inflammatory
Veldt grape (<i>Cissus quadrangularis</i>)	Rich in calcium, antioxidant, anti-inflammatory
Licorice root	Sweetener, Aromatic, cures respiratory problems, controls clogging mucus
Eucalyptus	Aromatic, Anti-inflammatory, anti-oxidant, anti-microbial
Betel leaves	Source of vitamin C, great source of calcium, analgesic, antiseptic, antifungal
Corn silk	Oral antidiabetic agent
Mint	Anti-inflammatory, freshener, antioxidant
Clove	Antioxidant, germicidal properties

VI. EXTRACTION OF CALCIUM HYDROXIDE

Eggshells were gone to garbage in many food industries. But it is rich in calcium in the form of carbonates and oxides. It makes very fine sources of hydroxyapatite. Normally, eggshells are low cost, renewable, and a sustainable organic product. For the preparation of calcium hydroxyapatite from eggshell, it is heated at 900°C for 2 hours in an in-box furnace. The final decomposed matter of eggshells is converted into calcium hydroxide. This mixture matter is finely grained, mixed with distilled water and treated with 0.5 M diammonium hydrogen phosphate solution. These reactants are irradiated with a microwave oven, repeatedly washed with distilled water, and dried at 100°C in an oven for overnight. This final product is the calcium hydroxyapatite which is derived from eggshell (12).

VII. CONCLUSION

Eggshells are non-valuable in food industries but it is very resourceful in non-nutritive in dental products. To mould a natural eco-friendly herbal product these eggshells were perfect alternatives for chemical reagents. So, these products offer a convenient and natural alternative to chemical reagents, making them a valuable and sustainable resource.

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