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DEVELOPMENT OF NOVEL HERBAL-BASED MOUTHWASH EFFECTIVE FOR THROAT PAIN

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ABSTRACT
This abstract explores the advantages and effectiveness of herbal mouthwash as a natural alternative for maintaining oral hygiene. Herbal mouthwashes, containing plant-based ingredients such as Clove oil, Peppermint oil, ginger, turmeric powder, Tulsi, and Guava leaves, offer various benefits including antimicrobial, anti-inflammatory, and antioxidant properties. Natural Plants such as Clove oil, Peppermint oil, ginger, turmeric powder, Tulsi, and Guava leaves are used in preparation of polyherbal mouthwash. Natural mouthwashes present promising advantages over chemical alternatives. Developing easily prepared and safely usable formulations of such mouthwashes using natural products could potentially enhance the overall dental health of the population.
KEYWORDS: *Herbal medicine, Guava leaves, Tulsi, Natural Plants.*

1. INTRODUCTION

Mouthwashes, renowned for their anti-inflammatory, antimicrobial, and analgesic properties, are commonly utilized for their refreshing, deodorant, and antiseptic effects. A potent mouthwash formulation should incorporate ingredients like clove oil, peppermint oil, guava leaves extract, turmeric powder, and ginger.

While mouthwashes boasting a 99.9% bacteria-killing ability may seem beneficial, indiscriminate bacteria elimination can disrupt the mouth's microbiome, compromising its ability to combat cavities, gingivitis, and halitosis. Incorporating mouthwash into both morning and bedtime routines can optimize its benefits, serving as an effective addition to daily oral care practices. (1)

Herbal mouthwashes, enriched with phytochemicals, offer desired antimicrobial and anti-inflammatory effects without alcohol, artificial preservatives, flavours, or colours. These natural formulations harness the cleansing and healing properties of herbs like clove and peppermint, known for their antiseptic and cooling effects, respectively. Scientifically validated herbs such as Triphala, Tulsi, Neem, and Pudina, whether used singly or in combination, have demonstrated safety and efficacy in addressing oral health issues such as bleeding gums, mouth ulcers, and tooth decay, without adverse effects. (2)

In recent years, herbal medicines and natural compounds have witnessed a surge in popularity, surpassing synthetic counterparts for managing various chronic inflammatory conditions. Notably, approximately half of the drugs approved by the Food and Drug Administration are either directly derived from or inspired by natural products, underscoring the therapeutic potential of nature-derived remedies in modern healthcare. (3)

1.1 History

- The importance of mouth and teeth cleanliness has been recognized from the earliest days of civilization to the 21st century.
- As far as we have come in creating dental solutions that are effectively treat and prevent various types of oral diseases, the mouthwash rinses our ancestor used to maintain a healthy smile were just as widely used as some of the around today.
- The first known references to mouth rinsing are in Ayurveda and Chinese medicine around 2700 BC. Mouthwash is a chemotherapeutic agent used as effective home care system by the patient to oral hygiene.

1.2 Explain

Mouthwash: Mouthwash is an aqueous solution which is most often used for control of plaque and is a medicated liquid which is held in mouth and swished by the action of perioral musculature to eliminate the oral pathogens.

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Herbal Mouthwash: Herbal mouthwashes serve as a valuable addition to oral hygiene routines, complementing activities like tooth brushing and flossing. Demonstrating effective anti-inflammatory and anti-plaque properties, they play a supportive role in periodontal therapy. Unlike chemical counterparts, herbal mouthwashes are free from alcohol, artificial preservatives, Flavors, and colors, making them a compelling alternative for sustaining oral hygiene, especially given the additional benefits conferred by herbal formulations. [4]

1.3 Types of Mouthwash

1) **Fluoride Mouthwash**
   Fluoride mouthwashes contain salt that aids in safeguarding teeth against cavities and decay. However, since fluoride is also present in toothpaste and water, caution is advised to avoid excessive fluoride intake, which can be detrimental to overall health.
2) **Antiseptic Mouthwash**
   Among the most common types, antiseptic mouthwashes typically contain alcohol and are favoured by individuals combating mouth infections to inhibit bacterial proliferation.
   They are also beneficial for addressing halitosis when used in conjunction with proper tooth brushing and flossing, helping to eliminate bacteria responsible for oral infections and bad breath.
3) **Cosmetic Mouthwash**
   Cosmetic mouthwashes primarily serve to freshen breath or mask unpleasant odors without providing substantial oral care benefits.
4) **Natural Mouthwash**
   Natural mouthwashes function similarly to other types but boast natural ingredients, making them a preferred option, particularly for those seeking alcohol-free alternatives. With safer ingredients compared to traditional mouthwashes, natural formulations offer a gentler yet effective approach to oral hygiene maintenance. [5]

1.4 Advantages of Herbal Mouthwash

- Fresh breath.
- Reduction of tooth decay with sodium fluoride.
- Decreased gum inflammation by eliminating bacteria.
- Teeth whitening through bleaching agents.
- All herbal mouthwashes do not contain alcohol and/or sugar.
- Herbal mouthwashes is gentle for even the most sensitive mouth.
- Herbal mouthwashes has naturally antibacterial property.
- It contain no harsh additives.
- It is highly in demand.

1.5 Benefits of Herbal Mouthwash

- Utilizes time-tested natural ingredients.
- Gentle for sensitive mouths.
- Provides a pleasant sensation.
- Naturally antibacterial.
- Free from harsh additives.
- Effective in maintaining oral hygiene without causing dryness. [6]
- It contains no harsh additives.
- It is highly in demand.
- It keeps your mouth healthy and plaque frees. [8]

1.6 Use of Herbal mouthwash

- Use of herbal mouthwash is to improve oral hygiene.
- It help to control dental plaque.
- It can be use in gum diseases.
- Used for killing germs in oral cavity.
- It freshen breath and covers bad breath.
- Using a mouthwash for gum disease prevention is very important.
- It relieve pain and inflammation.
- In treatment of Mucositis and Halitosis.
- Used in Periodontal diseases. [9]

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2. OBJECTIVE

The primary objective of herbal mouthwash is to promote oral health using natural ingredients. Specifically, herbal mouthwashes aim to:

1) **Reduce Bacterial Load:**
   They help decrease the number of harmful bacteria in the mouth, which can lead to plaque, gingivitis, and bad breath.
2) **Freshen Breath:**
   Many herbal mouthwashes contain natural oils and extracts like peppermint, eucalyptus, or clove, which help to freshen breath.
3) **Maintain Oral Hygiene:**
   They can be used as part of a daily oral care routine to complement brushing and flossing.
4) **Soothe Inflammation:**
   Ingredients like aloe vera and chamomile are known for their anti-inflammatory properties, which can help soothe gum inflammation.
5) **Prevent Cavities:**
   Some herbal mouthwashes contain substances that may help strengthen tooth enamel and prevent cavities.
6) **Provide Antioxidants:**
   Certain herbs have antioxidant properties that can help protect oral tissues from oxidative stress.

3. NEED OF WORK

Herbal mouthwashes offer a natural solution for oral hygiene, promoting improved oral health without harsh chemicals. Formulations containing Salvadora Persica, Piper Betle, and Belleric myrobalan have demonstrated effectiveness in reducing plaque and gingivitis. These mouthwashes aim to provide antibacterial, antifungal, and antioxidant properties, benefiting oral health without the adverse effects associated with traditional mouthwashes. Research supports their potential in maintaining oral hygiene and preventing oral diseases, highlighting their significance in oral care routines.

4. DRUG AND EXCIPIENT PROFILE

4.1 Clove Oil



Figure 1 Clove oil

Synonyms: Clove buds, Clove flowers
Botanical name: Syzygium aromaticum L
Family: Myrtaceae
Chemical constituents

- Clove oil primarily consists of eugenol, which is responsible for its characteristic aroma and many of its medicinal properties.

Use

- Natural antibiotic with broad antibacterial, antifungal, and antiviral properties. Acts as a carminative to increase stomach acid and boost peristalsis.
- Relieves toothache when applied to a decayed tooth. [10]

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4.2 Peppermint Oil



Figure 2 Peppermint oil

Synonyms: Mentha oil, mint oil
Botanical name: Mentha piperita
Family: Mentha piperita L.
Chemical constituents:

- Peppermint oil primarily contains menthol, which gives it its characteristic cooling sensation and aroma. Other major constituents include menthone, menthyl acetate, and 1,8-cineole.

Use:

- Treats stomach disorders, acts as a cough drop, eliminates 99% of germs causing bad breath and cavities.
- Contains menthone and menthyl esters, especially menthyl acetate. [(11)]

4.3 Turmeric powder



Figure 3 Turmeric powder

Synonyms: curcumin, Indian saffron
Botanical name: Curcuma longa.
Family: Zingiberaceae
Chemical constituents

- Turmeric powder contains several chemical constituents, but its main active compound is curcumin.

Use:

- Kills bacteria in the mouth, reduces inflammation, and promotes oral health.
- Acts as a natural antibiotic, detoxifying herb, antioxidant, and benefits cardiovascular, skeletal, and digestive systems. [(12)]

4.4 Ginger



Figure 4 Ginger

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Synonyms: Zingiber, Root ginger
Botanical name: zingiber officinale
Family: Zingiberaceae
Chemical constituents:

- Ginger contains a variety of chemical constituents, including gingerol, shogaol, paradol, and zingerone, which contribute to its distinctive flavor and aroma.

Use:

- This should be fresh and about one inch grated. Ginger is naturally antibacterial.
- Its natural flavor can also leave a refreshing sensation in the mouth.

4.5 Tulsi



Figure 5 Tulsi

Synonyms: Ocimum sanctum
Botanical name: Ocimum tenuiflorium
Family: Lamiaceae
Chemical constituents:

- Tulsi, also known as Holy Basil, contains a range of chemical constituents. Some of the main ones include eugenol, which gives it its characteristic aroma, as well as other essential oils like caryophyllene and methyl eugenol.

Use :

- Kills bacteria in the mouth, freshens breath, and promotes oral health.
- Leaves can be chewed or powdered for oral hygiene. [13]

4.6 Guava leaves



Figure 6 Guava leaves

Synonyms: Psidium leaves
Botanical name: Psidium guajava
Family: Myrtaceae
Chemical constituents

- Guava leaves contain a variety of chemical constituents, including flavonoids (such as quercetin, kaempferol, and myricetin), tannins, triterpenoids, essential oils, and phenolic compounds.

Use:

- Reduces inflammation of swollen gums and minimizes plaque.
- Chewing fresh guava leaves stops bleeding gums and bad breath.

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- Commonly used in mouthwashes for its antimicrobial properties to combat mouth infections. [14]

4.7 Menthol crystal



Figure 7 Menthol crystal

Synonyms: Peppermint camphor, Mentholatum
Botanical name: Mentha arvensis
Family: Lamiaceae
Chemical constituents:

- Menthol crystals are primarily composed of menthol, which is a naturally occurring organic compound.

Use:

- They can help freshen breath, provide a tingling sensation, and offer a pleasant taste.
- Additionally, menthol has mild antibacterial properties, making it a popular choice in oral care products to help combat bad breath and promote oral hygiene.

5. MATERIAL AND METHODS

5.1 Materials:

Clove oil, peppermint oil, turmeric powder, ginger, tulsi, guava leaves

5.2 Equipment:

1) **Mixing bowls**: For mixing the ingredients to prepare the herbal mouthwash formulation.
2) **Measuring instruments**: Weighing balance for accurate measurement of ingredients.
3) **Heating apparatus**: heating metal for boil water.
4) **Stirring rods or spatulas**: For thorough mixing and homogenization of the formulation.
5) **pH meter:** To monitor and adjust the pH of the herbal mouthwash formulation.
6) **Sterile containers:** To store the prepared antibacterial herbal mouthwash formulation, maintaining hygiene and preventing contamination.
7) **Packaging materials:** Such as transfer the herbal mouthwash solution in glass container for storage and distribution.

5.3 Experimental Work:

- **Formulation of herbal mouthwash**

Table no.1: Formulation table

Sr. no	Ingredients	Quantity Taken	Category
1	Clove oil	1ml	Anti-inflammatory
2	Peppermint oil	1ml	Reduce throat pain
3	Turmeric powder	2gm	Help reduce oral inflammation, Anti-inflammatory
4	Ginger	2gm	Immune booster, Weight loss
5	Tulsi	2gm	Stress relief
6	Guava leaves extract	5ml	Antioxidant
7	Menthol crystal	2gm	Antimicrobial, Anticancer

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5.4. Procedure

1. Collect and weigh all ingredients.
2. Prepare guava leaves extract.
3. Boil distilled water and add clove oil and peppermint oil.
4. Add turmeric powder, ginger, tulsi, and guava leaves extract.
5. Mix thoroughly with continuous stirring.
6. Filter the formulation.
7. Transfer the solution into suitable containers.
8. Pack and label in airtight containers.



Figure 8 Heating mantle



Figure 9 Formulation of herbal mouthwash

6. EVALUATION TEST

Colour and odour: Physical parameters like colour and odour can be examined by the visual examination.
pH: The pH value of the herbal mouthwash can be measured by using the pH paper.

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Figure 10 Determination of pH

Microbial growth test: The prepared mouthwash can be taken at a agar plate and the plate have to be placed in the incubator at 37ºC for 24 hour. After the incubation period the plate have to be checked for microbial growth and compare with control group.

Stability testing of mouthwash: The stability testing of pharmaceutical products is done for the assurance of product stability at environment conditions. This is done in order to determine the physical and chemical stability of the prepared product and also determine the safety of the product. [15]

7. RESULT AND DISCUSSION

Table no.2: Observation Table

Sr.no	Parameters	Result
1	Colour	Brown
2	Odour	Pleasant
3	pH	6.9
4	Microbial growth	No microbial activity
5	Stability	Stable

8. CONCLUSION

An attempt has been made to outline some of the commonly available herbs and plants, and certain fruits, which are readily available, and can be used as effective mouthwashes by all. If people can use and promote such cost-effective measures of maintaining the oral health which are also devoid of any untoward side effects, it may help in overcoming some common dental problems.

9. FUTURE PROSPECTIVE

1. **Growing Demand for Natural Products**
   With increasing consumer awareness about the benefits of natural ingredients and sustainability, there is a rising demand for herbal oral care products like mouthwash.
2. **Health Consciousness**
   People are becoming more conscious about their overall health, including oral health. Herbal mouthwashes, with their potential to provide effective oral care using natural ingredients, align well with this trend.
3. **Research and Development**
   Ongoing research and development efforts are likely to lead to the formulation of more effective herbal mouthwashes that address specific oral health needs, such as fighting bacteria, reducing inflammation, and promoting gum health.
4. **Innovation in Formulation**
   Advancements in herbal extraction techniques and formulation technology may lead to the development of mouthwashes with improved taste, aroma, and efficacy.

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