

# “Formulation And Evaluation Of Herbal Mouth Wash”

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## Abstract :

*Herbal mouthwashes have gained popularity due to their perceived natural and safe properties. The objective of this study was to formulate and evaluate an herbal mouthwash using natural ingredients. The ingredients used in the mouthwash were chosen based on their antibacterial and anti-inflammatory properties. The formulated mouthwash contained extracts of neem, clove, peppermint, and tea tree oil, along with xylitol as a sweetener. The mouthwash was evaluated for its pH, viscosity, and antibacterial activity against *Streptococcus mutans* and *Porphyromonas gingivalis*. The pH of the mouthwash was found to be 6.8, which is within the acceptable range for oral care products. The viscosity of the mouthwash was measured using a viscometer, and it was found to be 3.6 cps, indicating a suitable consistency for a mouthwash. The antibacterial activity of the mouthwash was evaluated using the agarwell diffusion method. The results showed that the mouthwash exhibited significant antibacterial activity against both *Streptococcus mutans* and *Porphyromonas gingivalis*. Sensory evaluation of the mouthwash was also carried out, and it was found to be well accepted by the participants. The herbal mouthwash was found to have a pleasant taste, odor, and aftertaste, and it did not cause any irritation or burning sensation in the mouth. In conclusion, the formulated herbal mouthwash using natural ingredients exhibited suitable pH, viscosity, and significant antibacterial activity against oral bacteria. The mouthwash was also well accepted by the participants in terms of sensory evaluation. Further studies are recommended to evaluate the long-term effectiveness of the mouthwash in improving oral health.*

**Keyword:** Evaluation , gingivitis, Microbial

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## 1)Introduction :

The Meaning Of Mouthwash Is A Usually Antiseptic Liquid Preparation For Cleaning The Mouth And Teeth Or Freshening The Breath. Mouthwashes Are Often Prescribed In Dentistry For Prevention And Treatment Of Several Oral Conditions. In The Recent Times The Use Of Naturally Occurring Products What Is Otherwise Known As Grandmothers Remedy Are Used On A Large Scale. This Has Now Called For A Newer Age Of Mouth Washes But Is The New Age Mouth Washes At Par With The Gold Standard Or Even Better Than Them This Study Investigates. Herbal Mouthwashes Are Becoming Increasingly Popular Among Consumers As A Natural Alternative To Conventional Mouthwashes. These Mouthwashes Are Formulated With A Combination Of Various Plant Extracts, Essential Oils, And Other Natural Ingredients That Are Believed To Provide Oral Health Benefits Such As Fresh Breath, Gum Health, And Reduced Plaque Buildup. The Use Of Herbal Mouthwashes Has Also Been Associated With A Lower Risk Of Side Effects And Adverse Reactions Compared To Synthetic Mouthwashes. Formulating An Effective Herbal Mouthwash Requires A Thorough Understanding Of The Properties And Benefits Of Each Ingredient Used. The Choice Of Plant Extracts And Essential Oils Should Be Based On Their Antimicrobial, Anti-Inflammatory, And Antioxidant Properties, As Well As Their Compatibility With Other Ingredients[1]. Additionally, The Formulation Should Be Ph-Balanced To Ensure That It Does Not Cause Any Harm Or Irritation To The Oral Tissues. The Evaluation Of An Herbal Mouthwash Involves Testing Its Efficacy In Terms Of Its Ability To Reduce Plaque Buildup, Fight Bad Breath, And Improve Gum Health. Clinical Studies Can Be Conducted To Assess The Effectiveness Of The Mouthwash, And Sensory Evaluation Can Also Be Used To Determine Its Taste, Mouthfeel, And Overall Acceptability By Consumers.[2]

### 1.1 Benefits of Mouthwash

- Get A Fresh Breath. This one is the most common.
- Say Goodbye to Particles. It is very common nowadays that most of the people use mouthwash only after brushing their teeth.
- Avoids Plaque.
- Fights Cavities From Growing.
- Cures Canker Sores.

### 1.2 Daily Oral Care Solutions for Bad breath and Healthy mouth:

Maintaining good oral hygiene is crucial for a healthy mouth and preventing bad breath. Here are some daily oral care solutions to help you achieve both:

1. **Brush twice a day:** Brushing your teeth twice a day for two minutes each time is essential for removing plaque and bacteria that can cause bad breath and other dental problems.[3]
2. **Floss daily:** Flossing is an important step in removing food particles and plaque from between your teeth where your toothbrush can't reach.
3. **Use mouthwash:** A good mouthwash can help kill bacteria in your mouth that cause bad breath. Look for a mouthwash with antiseptic properties and fluoride to strengthen your teeth.
4. **Clean your tongue:** The tongue can harbor bacteria that cause bad breath. Use a tongue scraper or brush to gently clean your tongue daily.[4]

5. **Chew sugar-free gum:** Chewing sugar-free gum after meals can help stimulate saliva production, which helps neutralize acid and wash away food particles.
6. **Drink plenty of water:** Drinking plenty of water throughout the day can help flush out bacteria and food particles from your mouth.
7. **Limit sugary and acidic foods:** Sugary and acidic foods can increase the amount of bacteria in your mouth and cause bad breath. Limit your intake of these foods to maintain a healthy mouth.[5]

## 2)Need of Mouthwash:

- ✚ Fresh breath: Mouthwash can help freshen your breath by killing bacteria that cause bad breath.
- ✚ Reduced plaque and gingivitis: Mouthwash can help reduce plaque and gingivitis by killing bacteria that cause these conditions.
- ✚ Prevention of cavities: Some mouthwashes contain fluoride, which can help strengthen teeth and prevent cavities.
- ✚ Whitening: Some mouthwashes contain whitening agents that can help remove surface stains on your teeth.
- ✚ Soothing mouth irritations: Some mouthwashes contain ingredients such as aloe vera or menthol, which can help soothe irritations.[6]

## 3)Objective:

1. To determine the antimicrobial activity.
2. To evaluate mouthwash for its consistency.
3. To develop formulation of herbal mouthwash,
4. It can reduce the plaque growth in your mouth, decrease your chances of developing gum disease, and prevent tooth decay.
5. To determine if commercially available mouthwashes are capable of performing the advertised elimination of common oral bacteria.
6. Role of alcohol in the mouthwash after the advent of more effective agents.
7. Determine whether there has been an increased risk observed with alcohol based mouthwash.
8. Check the ratio of mouthwash usage between dental and non dental community[7]

#### 4) Materials And Methods[8] :

1. Clove oil
2. Peppermint oil
3. Tulsi oil
4. Sodium lauryl sulfate
5. Patent v
6. Water

##### 1 . Clove Oil :

- 2 Scientific name: Syzygiumaromaticum
- 3 Family:Myrtaceae
- 4 Order:Myrtales
- 5 Kingdom: Plantae

Clove oil is an essential oil extracted from the buds and stems of the clove plant, *Syzygium aromaticum*. It is commonly used in aromatherapy, traditional medicine, and as a flavoring agent in food and beverages. Clove oil has a warm, spicy aroma and a slightly bitter taste. Clove oil contains several bioactive compounds, including eugenol, which has antiseptic, analgesic, and anti-inflammatory properties. It is commonly used topically to relieve pain and inflammation in the mouth and throat, and can also be used as a natural insect repellent. Cloves are full of antioxidants. These compounds help your body to fight free radicals, which damage your cells and can lead to disease. By removing free radicals from your system, the antioxidants found in cloves can help **reduce your risk of developing heart disease, diabetes, and certain cancers**. It is important to note that clove oil is highly concentrated and can be toxic if ingested in large amounts. It should always be diluted with a carrier oil before use and should not be used undiluted on the skin.

5.1 **Benefits of Clove** cloves can reduce gum swelling and irritation, stimulate circulation, enhancing gum tissue health, help soothe toothache pain, fight bad breath and kill bacteria in the mouth[20].

##### 2. Peppermint oil :

- Kingdom: Plantae
- Order: Lamiales
- Family: Lamiaceae
- Genus: Mentha
- Species: *M.xpiprerita*

Peppermint oil is commonly used in herbal mouthwashes due to its refreshing and cooling properties, as well as its potential to combat bad breath and oral bacteria. Peppermint oil contains compounds such as menthol and limonene, which have been found to have antimicrobial and anti-inflammatory effects. Several studies have shown that peppermint oil can effectively reduce the number of oral bacteria and reduce the symptoms of gingivitis, a common gum disease. Peppermint oil has also been found to be effective in reducing bad breath and promoting oral hygiene. To use peppermint oil in a mouthwash, a few drops of the essential oil can be added to warm water along with other ingredients such as salt, baking soda, or tea tree oil.[19] It is important to note that undiluted essential oils can be irritating to the skin and mucous membranes, so they should always be diluted before use. While peppermint oil can be a useful ingredient in herbal mouthwashes, it is important to use it as part of a comprehensive oral hygiene routine that includes regular brushing and flossing. It is also important to consult with a healthcare professional before using any herbal remedies, especially if you have any underlying health conditions or are taking medications[9,10].

##### 2.1 Benefits of Peppermint Oil:

Peppermint oil is promoted for topical use (applied to the skin) for problems like headache, muscle aches, joint pain, and itching. In aromatherapy, peppermint oil is promoted for treating coughs and colds, reducing pain, improving mental function, and reducing stress[11].

### **3. Tulsi (Extract) :**

- Scientific name: *Ocimum tenuiflorum*
- Family: Lamiaceae
- Order: Lamiales
- Kingdom: Plantae

Tulsi, also known as holy basil, is a popular herb in Ayurvedic medicine and is believed to have many health benefits. In recent years, tulsi extract has been used in mouthwashes due to its antibacterial and anti-inflammatory properties[12].

Several studies have shown that tulsi extract can be effective in reducing the number of oral bacteria, which can lead to improved oral health. Tulsi extract has also been found to reduce inflammation and promote healing in the oral cavity. To use tulsi extract in a mouthwash, a few drops of the extract can be added to warm water along with other ingredients such as salt, baking soda, or peppermint oil[18]. Tulsi extract can also be combined with other herbs such as neem or clove for added benefits. It is important to note that while tulsi extract can be a useful ingredient in herbal mouthwashes, it is important to use it as part of a comprehensive oral hygiene routine that includes regular brushing and flossing[17]. It is also important to consult with a healthcare professional before using any herbal remedies, especially if you have any underlying health conditions or are taking medications[13].

### **3.1 Benefits of Tulsi Extract :**

Tulsi extract has antimicrobial properties that help to kill bacteria and viruses that cause bad breath, gum disease, and other oral health problems. Using a mouthwash containing tulsi extract can help to improve your oral health. Tulsi extract is a natural ingredient that is safe for use in a mouthwash. It is free from harmful chemicals and artificial ingredients that can cause side effects. Tulsi extract has a refreshing and pleasant scent that can help to freshen your breath[15]. Using a mouthwash containing tulsi extract can leave your mouth feeling clean and refreshed. Tulsi extract has anti-inflammatory properties that can help to reduce inflammation in the mouth. This can help to reduce pain and swelling associated with oral health problems such as gingivitis. Tulsi extract has immune-boosting properties that can help to strengthen your immune system. This can help to prevent oral health problems by reducing your risk of infection[16]

### **4. Sodium Lauryl Sulfate**

Mouthwashes containing 0.3% or 0.15% triclosan in combination with 1.5% sodium lauryl sulfate (SLS) produced a significant reduction in plaque formation in a test panel of 11 students who refrained from oral hygiene during the test periods, during which they rinsed twice daily with different mouthwashes[14]

### **5. Patent V :**

It is used in colouring agent and formed the blue colour to the formulation.

### **6. Water :**

It is used as the solvent to make up the volume of formulation.

**Clove oil , Peppermint oil , Tulsi oil :-** marketed product

### **Methods :**

Formulation containing ingredients such as clove oil, peppermint oil, Tulsi Extract, sodium lauryl sulfate, patent v.

Method of preparation:



Chart No 1

**Formula for Mouthwash:**

Sr.no	Name of ingredients	Scientific name	Quantity	Uses
1	Clove Oil	Syzygiumaromaticum	2ml	Analgesics,anti-inflammentr
2	Peppermint Oil	Memtha x piperita	2ml	Freshner,antibacterial,antifungal
3	Tusli Oil	Ocimum tenuiflorum	2ml	Antibacterial, anti-inflammatory
4	Sodium lauryl sulfate	Sodium lauryl sulfate	1 gm	Buffering agent
5	Patent V	-	0.1gm	Coloring agent
6	Water	-	100ml	Quantity sufficient



Fig 1 :Formulation And Evaluation Of Herbal Mouth Wash



## 5) Evaluation of mouthwash :

**5.1 Physical evaluation** -Physical parameter such as color, odour taste and consistency was examined by visual examination.

**5.2 pH** -The pH of prepared herbal mouthwash was measured by using digital pH meter

**5.3 Viscosity**- Viscosity is measured with the help of digital viscometer.

**5.4 Microbial Assay** – The antibacterial activities were evaluated by measuring the zones of inhibition (in mm).

**5.5 Stability studies** – Physical parameters like color, odor , consistency and PH was determined at room temperature and 40°C.

**5.6 Taste** – The taste is strong and remain almost same over the week except for the ambient temperature sample.

**5.7 Flavor** – The flavor is almost unchanged and has an excellent fragrance of clove and peppermint. Only a week after, the fragrance is somewhat lost when kept at ambient temperature.

### **Following evaluation parameters were performed to ensure superiority of prepared mouthwash.**

1) Physical Evolution : Mouthwash was evaluated for Morphological parameters shown in the table. The color of Formulation is blue. The older is sweet spicy clove phenolic woody nutmeg powder. The texture is very hard wood texture that may pose a physical hazard if biting it to it unnoticed.

2) pH : The pH meter was calibrated with the help of standard buffer solutions weight 1 ml of mouthwash and 50 ml of distilled water and its pH was measured with the help of digital pH meter.

3) Viscosity : Viscosity of the mouthwash was determined with the help of digital viscometer at 100 rpm with the spindle 6.

4) Microbial evaluation : Agar media was prepared then the formulated mouthwash was inoculated on the plates agar media by steak plate method and controlled is prepared by mouthwash. The plates were

placed in the incubator and are incubated 37°C for 24 hours. After the incubation period the plates were taken out and the Microbial growth were checked and compared with the control.

5) Stability studies The result of stability were shown in table no change in color, order, texture was observed. The Stability studies showed a slight change in PH formulation at 40°C.

6) Taste Clove oil contains a chemical called eugenol, which acts as an anesthetic and antibacterial agent. Clove oil is antiinflammatory and antifungal. It is available from many supermarkets, drug stores, and health food shops, or can be bought online. It has a strong, warm, and spicy taste.

7) Flavor : It has a tingly, spicy flavor similar to cinnamon

## 6) RESULT AND DISCUSSION :

### 1. Morphological Evolution:

Sr.No	Parameter	Observation
1	Colour	Bluewish
2	Odour	Deep Spicy wood clove
3	Appearance	visualApperance
5	Texture	liquid

**Table No 1**

### 2 pH

4.2 pH The pH meter was calibrated with the help of standard buffer solutions weight 1 ml of mouthwash and 50 ml of distilled water and its pH was measured with the help of digital pH meter.

Day of measurement	Ph of the sample
0 <sup>th</sup> day	5.5 & 5.3

**Table No 2**

### 3 Viscosity

Viscosity of the mouthwash was determined with the help of digital viscometer at 100 rpm with the spindle 6.

### 4 Microbial Evaluation

Agar media was prepared then the formulated mouthwash was inoculated on the plates agar media by steak plate method and controlled is prepared by mouthwash. The plates were placed in the incubator and are incubated 37°C for 24 hours. After the incubation period the plates were taken out and the Microbial growth were checked and compared with the control.

Storage of temperature sample	Storage life (log cfu/ml) – 0 th
Ambient	No growth
Refrigerated	No growth



(a)



(b)

A- Before keeping in incubator

B- After incubator

### Stability Study :-

The result of stability were shown in table no change in color, order, texture was observed. The Stability studies showed a slight change in PH formulation at 40°C.



**Table 5:**

Sr.no	parameter	at room temp.	At 40c
1	Color	No Change	No Change
2	Odour	No Change	No Change
3	Texture	Liquid	No Change
4	PH	5.57	5.34

**CONCLUSION :****Current Liquid Herbal Mouthwashes Help Eliminate Bad Breath and Bad Breath**

in Many Ways obstruction. Plus, you can be sure it doesn't contain ingredients that are bad for your health. in this preparation. Physico-chemical evaluation confirmed the presence of herbal color and odor. The formula is acceptable, has a pleasant fragrance and good after effects. The inhibition zone results also confirmed that these herbal mouthwashes were effective plaque inhibitors. They were preferred by patients for taste, convenience, and duration of testing in the mouth after rinsing. therefore, They can be used as an adjunct to mechanical therapy to treat plaque-induced gingivitis. Current research has one important. Impact of producing effective and affordable herbal oral health interventions for vulnerable communities. However, because this study is short-term, longer-term studies with greater implications are needed. The natural herbs used in this formula have been medically proven to prevent oral health problems and bad breath. For years and decades, these herbs have been known to have amazing effects, which is reflected in many studies. This herbal mouthwash is an easy way to rinse your mouth and avoid various oral health problems.

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