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## Study of Different Herbs in Oral Hygiene

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### ABSTRACT

Several different varieties of mouthwashes are accessible to us nowadays, including chemical as well as herbal formulations. Medicinal plant or herbs are considered to have rich source of ingredients which can be used in drug development. They can prevent and cure disease because of their antimicrobial and antibacterial property against bad bacteria those are present in mouth. The main objective of this literature is to evaluate different ingredients used in herbal mouthwash and their action. In this article, we study the different herbs namely Neem, Tulsi, Mint, Turmeric, Clove, Liquorice, Cinnamon which can be used in herbal mouthwash.

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### INTRODUCTION

A Mouthwash is a liquid dosage form. It is used orally. We use Mouthwash to maintain Oral hygiene<sup>1</sup>. It kills both good and bad bacteria<sup>2</sup>. Good bacteria like (Probiotics). Probiotics play an important role in maintaining Oral health, breaking down food, and making breath fresh<sup>3</sup>. Good Bacteria, Fungi, and Yeast stop the growth of bad bacteria<sup>4</sup>. Good Bacteria also help in the Digestion of food<sup>5</sup>. To maintain the balance of good mouth bacteria Daily mouth hygiene is mandatory with the help of a toothbrush after meal<sup>6</sup>. Probiotics and all good bacteria are important for a healthy mouth nutritional diet and a proper Dental care routine can help to keep your mouth free from bad smells and give a Healthy smile<sup>7</sup>.

### LIQUID DOSAGE

The liquid dosage form is a pourable pharmaceutical formulation<sup>8</sup>. For the preparation of liquid dosage form, a lot of additive ingredients are used such as vehicles, stabilizers, preservatives, suspending agents, emulsifying agents, solubilizes, coloring agents, flavoring agents, etc<sup>9</sup>. It can be supplied as ready-to-use liquid or powder for reconstitution. We administered this dosage form such as Oral, Parenteral as well as external use<sup>10</sup>. It is widely used in pharmaceuticals due to their fast onset of action. It is useful because some patients have problems swallowing solid dosage forms<sup>11</sup>. They are two types Monophasic and Biphasic<sup>12</sup>. In monophasic liquid ingredient (API) is completely dissolved in the vehicle. It contains a single homogenous phase. This solvent is present in a larger volume than the active ingredient<sup>13</sup>.

In the 18th century, urine was used to maintain Oral hygiene due to Ammonia, Ammonia has cleansing abilities<sup>14</sup>. Mouth rinses are used help to with oral hygiene and also help in the delivery of active ingredients to the teeth and gums<sup>15</sup>. The study is designed to evaluate the efficacy of herbal mouthwash for the treatment of oral disease<sup>16</sup>. It is used as anti-plaque with minimal side effects that can be used as an effective auxiliary mechanical plaque control is needed<sup>17</sup>. Natural products have been used as traditional medicine for thousands of years<sup>18</sup>. Mouthwashes which are prepared with the help of herbal ingredients help to treat chronic

gum disease by controlling bleeding and inflammation<sup>19</sup>. 35 different types of Indian herbs are traditionally used for different types of disease<sup>20</sup>. Herbs and herbs product isolates exhibit sway that are immune enhancing, anti-inflammatory, anti-neoplastic etc<sup>21</sup>. This herbal mouthwash shows less ADR and long effect and wants to be calibrated<sup>22</sup>. At this time Herbal products are in high demand in the market because it is very safe and respond quickly without any side effects and make our immune strong<sup>23</sup>.

### Advantages of liquid dosage form: -

- It is good for those patients who have problems in swallowing.
- It has a faster absorption rate as compared to solid dosage.
- It comes in different – different flavor.
- It is highly flexible.

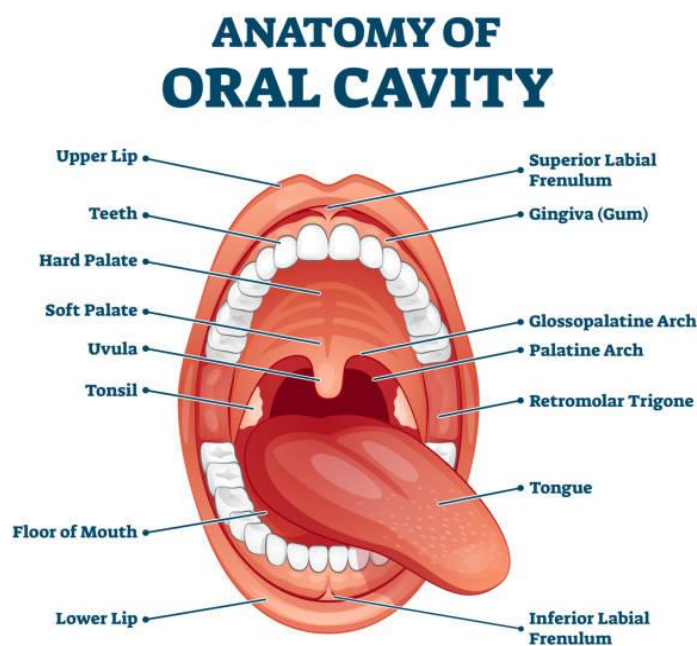
### Disadvantages of liquid dosage form:-

- Its expiry date is too short compared to other dosages form
- Tough in measuring accurately
- Its storage is also difficult
- The chances of microbial contamination are very high

## ANATOMY OF MOUTH

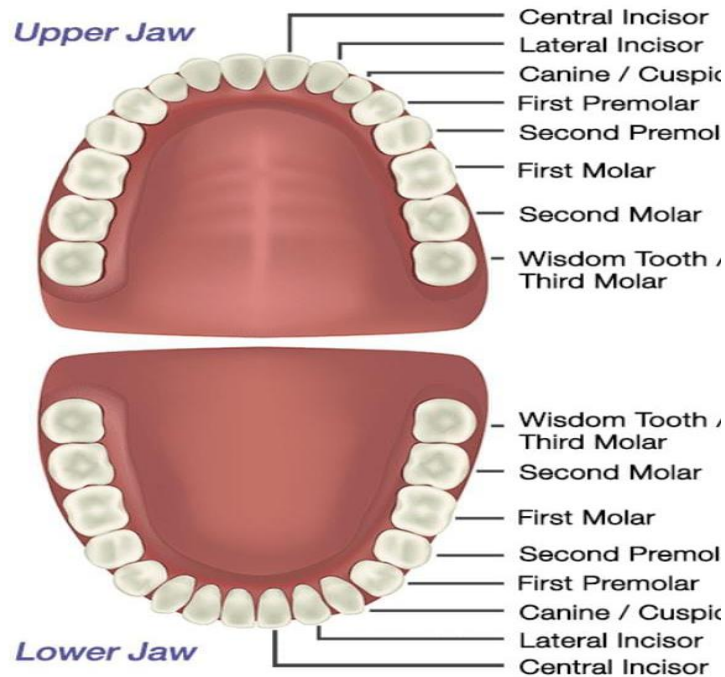
### Oral Cavity

- It is the first and starting part of the digestive system
- It provides the shape of our face
- Its primary function is eating and speaking
- The oral cavity is the main entry point of bacteria and viruses inside the body
- The oral cavity includes the lips, Gums, Roof of the mouth(palate), inner lining of the teeth, tongue, and floor of mouth<sup>24</sup>.
- The Oropharynx is not part of the Oral cavity



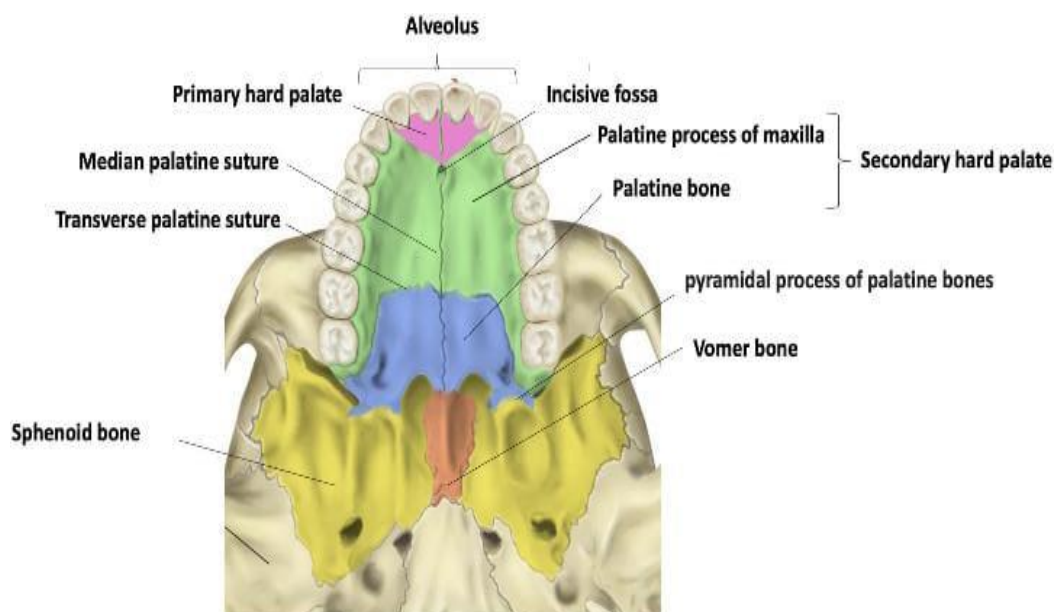
## Teeth

- Teeth are a major and important part of the Digestive system<sup>25</sup>.
- It is the only part of the body that cannot repair itself
- The total no of teeth present in our mouth is 32: 12 molar, 8 premolar, 4 canines and 8 incisions<sup>26</sup>.
- The main function of teeth is chewing food



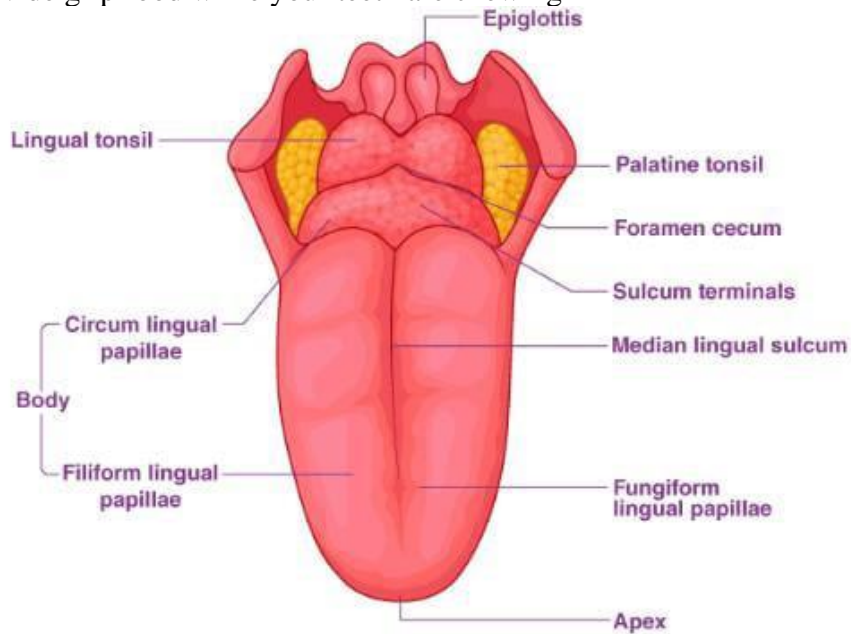
## Hard Palate

- It is also called as Roof of the mouth
- It belongs to the oral cavity
- It is Horseshoe shaped
- A hard plate separates the Oral cavity from the Nasal cavity<sup>27</sup>.



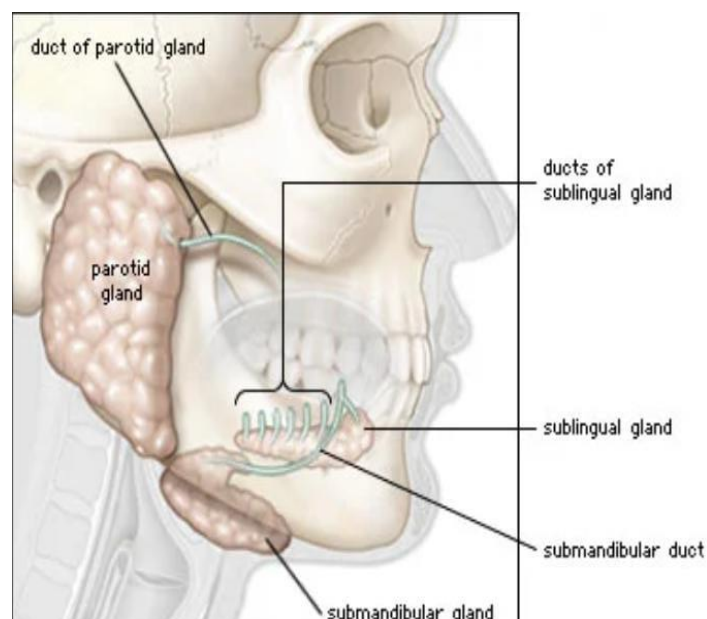
## Tongue

- It is a part of the oral cavity and also a part Digestive system.
- It also helps and plays an important role in breathing.
- Its main functions are tasting, speech, and licking.
- The Papillae present on top of the tongue
- Papillae provide grip food while your teeth are chewing



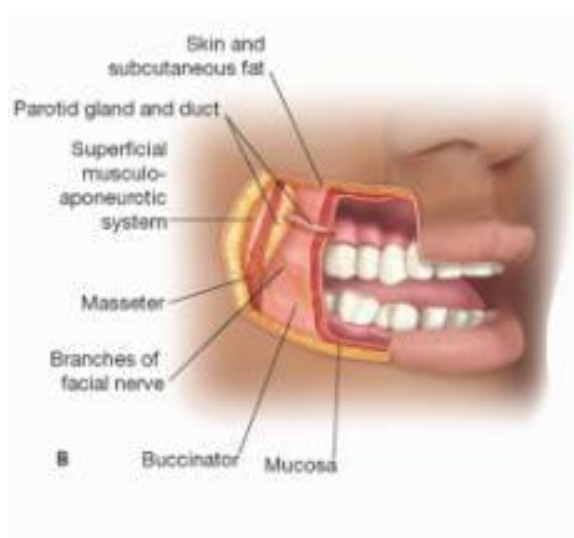
## Salivary Gland

- It is also a part of the Digestive system and oral cavity
- It is also part of the exocrine gland.
- It makes and excreted saliva makes deglutition food easy.
- Saliva prevents our teeth from Bad bacteria
- It mixes with food bolus and bolus gets soft and makes it easy to engulf from the throat.



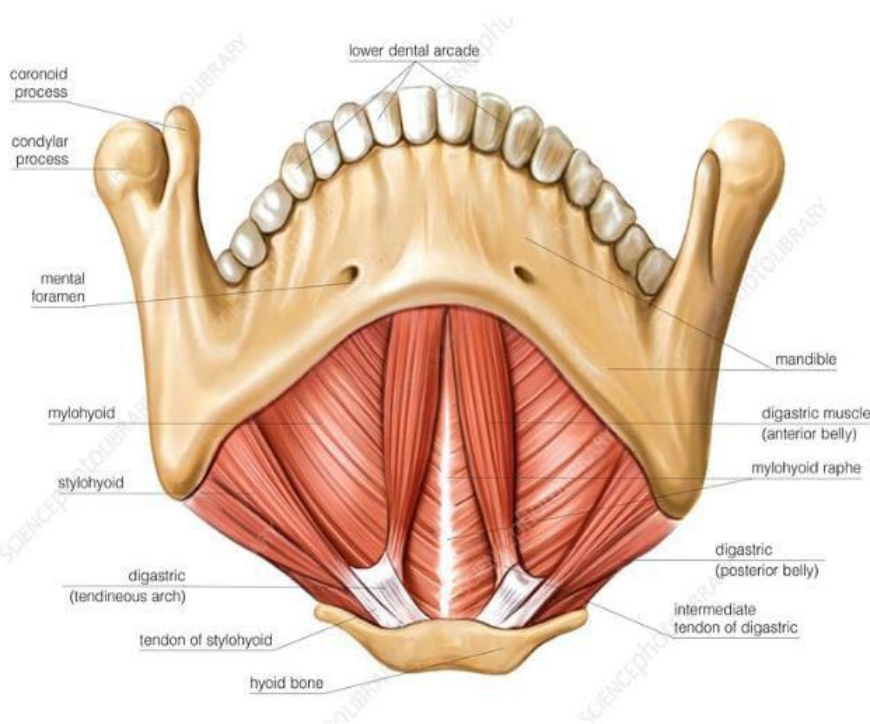
## Cheek Mucosa

- It is the inner lining of the cheeks
- It is located inside of our mouth to just behind our last teeth
- It provides support resisting the forces exerted during mastication



## Floor of Mouth

- It is U and Horseshoe shaped located below the tongue and lower the jawbone (MANDIBLE)
- It provides support for our tongue
- It is made up of Mylohyoid muscle.

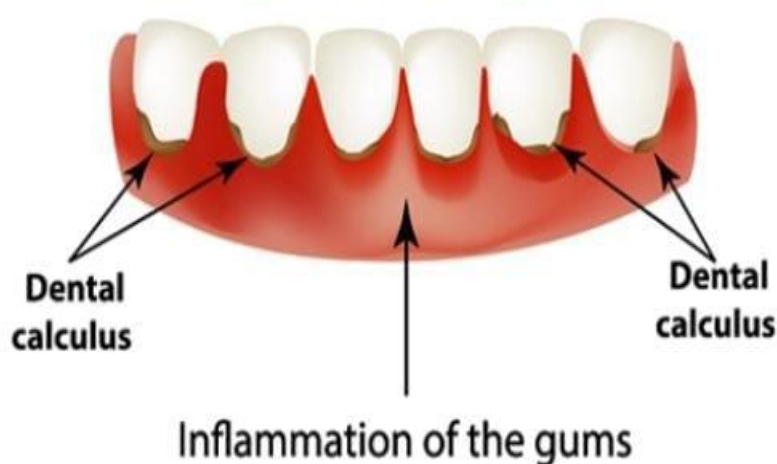


The general problems that occur in the oral cavity are discussed below

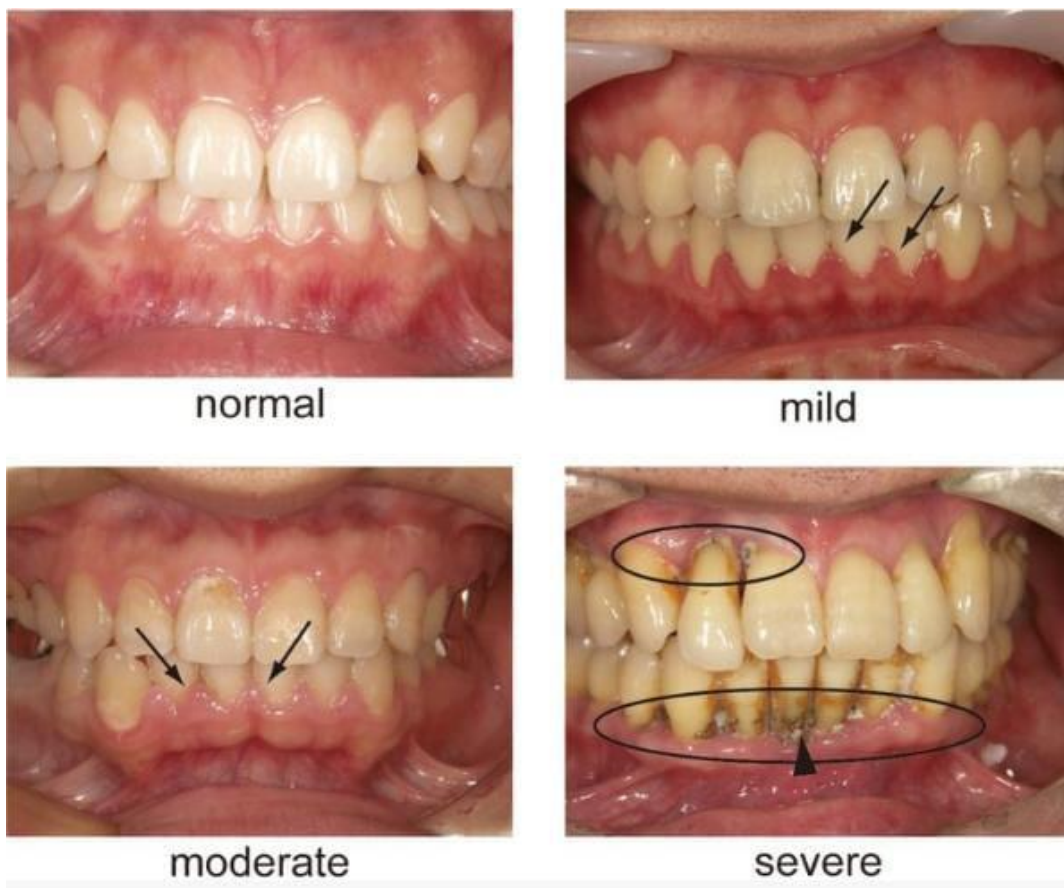
- **Plaque** is the primary etiologic agent it leads to many types of oral disease like gingivitis and periodontal disease<sup>28</sup>. Plaque is not removed when it is soft. When it became difficult to remove. It can cause tooth decay or tooth loss.



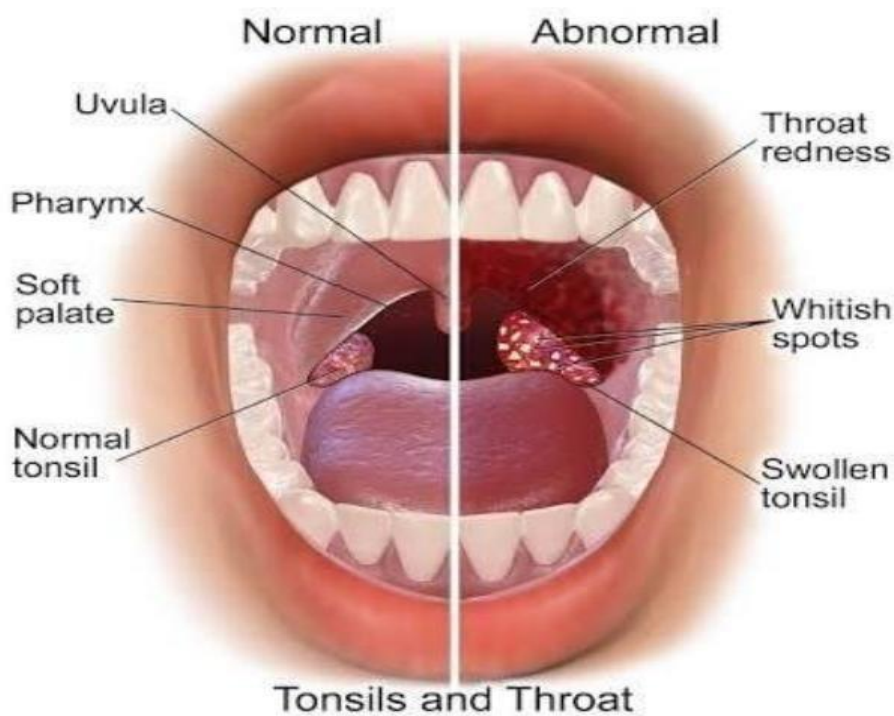
- **Gingivitis** is caused by inflammation and bleeding of the gums. The main cause of this gingivitis is plaque that develops on the surface of teeth. It is the smallest form of unhygienic mouth<sup>29</sup>.



- **Periodontal** disease is mainly caused by the infection of bones and gums that provide support to the teeth. This periodontal is also called gingivitis in an earlier stage, gums may bleed<sup>30</sup>.



- **Halitosis** is derived from two words Halitus and osis Halitus means breath and osis means disease<sup>31</sup>. It means disease caused due to bad breath.



## DRUG PROFILES

### Mint Oil

**Synonyms:-** Pudina, Mint candy, Chew

**Biological Source:-** Leaves of the plant *Mentha piperita*.

**Kingdom:-** Plantae(plants)

**Order:-** Lamiales

**Family:-** Lamiaceae.

**Genus:-** *Mentha*.

**Species:-** *Mentha piperita* Linnaeus



**Chemical constituents:-** Menthol, Methane, Cineole, Methyl acetate, ketones<sup>32</sup>

**Mechanism of Action:-** Methyl acetate and ketone are found in mint in sufficient amounts it is Mint leaves also contain menthol and ethyl acetate giving a fresh effect (studies)<sup>33</sup>

#### Function:-

- It has anti-bacterial property
- It gives a cooling and fresh effect
- It also has anti-inflammatory properties

#### Side Effect:-

- It causes inflammation in the mouth.
- It causes redness on the face
- It causes allergic reactions<sup>34</sup>.

### Clove

**Synonyms:-** Laung, clove buds

**Biological Source:-** Plant buds of *Eugenia caryophyllus*

**Botanical Name:-** *Syzygium aromaticum* (slideplayer)<sup>35</sup>

**Order:-** Myrtales

**Family:-** Myrtaceae

**Genus:-** *Syzygium*

**Species:-** *S.aromaticum*



**Chemical Constituents:-** Eugenol, Caryophyllen, Methyl amyl ketone, Eugenyl acetate.

#### Mechanism of action:-

- In clove, eugenol is present in sufficient amounts. Eugenol is responsible for the inhibition of the synthesis of prostaglandin. Due to the inhibition of prostaglandin, it reduces the pain<sup>36</sup>.

**Function:-**

- It is used as an anti-fungal agent.
- It is used as an antiseptic agent.
- It is used as a local anesthetic.
- It reduces mouth ulcers.

**Side Effect:-**

- It causes mouth sensitivity.
- It causes soreness of teeth.
- It causes skin irritation.
- It causes itching<sup>37</sup>.
- When we directly apply clove, it is very spicy and strong warm.

Ingredient	Mechanism Or uses
Clove	Eugenol is a constituent that present in clove. Eugenol inhibits prostaglamdin synthesis. Reduce pain, Used in mouth ulcer
Mint	It contains Menthol and acetyl acetate gives fresh effect. Gives fresh and cooling effect.

**Neem**

**Synonyms:-** Neem tree, Nim tree, margosa

**Biological Source:-** Leaves of neem plant<sup>38</sup>

**Botanical Name:-** Azadirachta indica.

**Kingdom:-** Plantae

**Order:-** Sapindales.

**Genius:-** Azadirachta

**Species:-** A.indica

**Chemical Constituents:** - Azadirachtin, Quercetin, polyphenolic, and Beta-sitosterol



**Mechanism of Action**

In clove, Azadirachtin is found in sufficient amounts it damages or rupture the cell membrane of microorganisms. Quercetin, polyphenolic, and Beta-sitosterol are also present in clove and these compounds give anti-bacterial activity and remove dental caries [39]

**Function**

- Used as an anti-inflammatory.
- Also used against gingivitis.
- It is also used as an anti-plaque.

**Side Effect**

- It causes drowsiness.
- It causes loss of consciousness.
- It causes blood disorder<sup>40</sup>.

## Tulsi

**Synonyms:-** Holy basil, Sacred basil<sup>41</sup>

**Biological source:-** Leaves of basil, shrubs<sup>42</sup>

**Botanical Name:-** Ocimum sanctum.

**Kingdom:-** Plantae<sup>43</sup>

**Order:-** laminate

**Family:-** Lamiaceae.

**Genus:-** Ocimum<sup>44</sup>

**Species:-** Ocimum sanctum



**Chemical Constituents:-** Eugenol, Ursolic acid, Rosmarilic acid, Chlorophyll, Zinc, Calcium iron<sup>45</sup>.

**Mechanism of Action:-** Eugenol present in tulsi in sufficient amounts eugenol inhibits the Cox-2 enzyme and the conversion of arachidonic acid to prostaglandin and provides relief from inflammation and pain.

### Function:-

- It helps to remove oral malodor.
- It gives anti-allergic property.
- It used as an oral disinfectant.
- It helps to prevent the oral cavity infection.

### Side Effects:-

- It causes discoloration of teeth.
- It causes damage to teeth when chewed.
- Excessive use of this can lead to nausea.
- Excessive use of Tulsi causes nausea<sup>46</sup>.

**Table 1. Ingredients and their Mechanism or Uses**

INGREDIENTS	MECHANISM OR USES
Clove	Eugenol is a constituent that present in clove. Eugenol inhibits prostaglandin synthesis. Reduce pain, Used in mouth ulcer
Mint	It contains Menthol and acetyl acetate gives fresh effect. Gives fresh and cooling effect.
Neem	In Neem Azadirachtin present in sufficient amount. It ruptures the microorganism cell membrane. Provide relief from odontogenic pain
Tulsi	In Tulsi Eugenol present as a main active constituent. It inhibits cox-2 enzyme and inhibits the conversion of Arachidonic acid to prostaglandin H <sub>2</sub> . Provide relief from toothache, throat pain and inflammation <sup>47</sup> . Also used as Dental care.
Liquorice	It gives anti-inflammatory effect by reduce the production and secretion of cytokines. It protects and prevents our teeth from plaque buildup and also prevent gingivitis.

Cinnamon	Cinnamon and its extract contain essential oils inhibit the bacterial growth by damaging cell membrane of bacteria. It is used as antibacterial and also used as sweetening agent.
Turmeric	It also inhibits the growth of microorganism and bacteria also. Turmeric is potent anti-inflammatory, antimicrobial and antiseptic.

## CONCLUSION

A study effort has been done to know the mechanism and uses of different herbs for mouth and teeth cleaning. For the present study neem, tulsi, liquorice, cinnamon, mint, clove and turmeric have been studied for their action in mouthwash. The natural herbs studied there have been medicinally proven to prevent the problem of oral, dental and also from bad breath without any side effects. Person can easily rinse his mouth using this herbal mouthwash and stay clear of wide variety of oral health issues.

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