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# FORMULATION AND EVALUTION OF HERBAL MOUTHWASH

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## Abstract

The aim of this study was to prepare and evaluate herbal mouthwash to cure oral diseases. Now-a-days herbal mouthwashes are in high demand as compared to chemical mouthwashes because of their antibacterial, anti-inflammatory and analgesic property.

For preparation of herbal mouthwash different natural herbs are used such as cleome gynandra (African cabbage), curcuma longa (Turmeric), syzygium aromaticum (clove),Glycyrrhiza glabra (Liquorice) , sapindus mukorossi (Reetha) etc. The medicinal herbs which are collected and their water soluble extracts are prepared. Herbal mouthwash is liquid solution which is stable in different temperature condition. It possesses antimicrobial and antifungal activity against pathogen. Herbal products gives more efficacy, safety, stability to modify the diseased condition of the oral cavity.

**Keywords :** Oral hygiene, Mouthwash, Antibacterial, Herbal

## Introduction

Mouthwash is a simple, flavored, colored solution that is aimed to refresh the breath by swishing the product around the mouth, followed by spitting it out. Similar to toothpaste, it may also have additional benefits, such as prevention against tooth decay, gingivitis, plaque formation or tartar formation. Mouthwash, exclusively for bad breath and refresh the mouth . Herbal mouthwash is in high demand because they relieve pain instantly and also less side effective, while chemical mouthwashes have hydrogen peroxide and chlorhexidine which produce discoloration of teeth and side effects and also they are cost effective.

Medicinal plants such as cleome gynandra have an antimicrobial and antifungal activity. It is African origin plant also occurs in tropical and sub- tropical regions. It belongs to family cleomaceae. It is rich source of

vitamins, proteins and minerals. Curcuma longa (Turmeric) is a perennial , rhizomatous , herbaceous plant belongs to zingiberaceae family. Curcumin is important chemical constituent present in it, which has antioxidant function. Syzygium aromaticum (clove) is aromatic flower bud of a tree in the family Myrtaceae which is commonly used as a spice, flavoring or fragrance in consumer products. Glycyrrhiza glabra (Liquorice) , a flowering plant of the bean family fabaceae. It is used for cough , bronchitis , inflammation , ulcers etc. Sapindus mukorossi , commonly known as reetha ,is a species of tree in the family sapindaceae. Menthol used as flavoring agent in breath freshness.

## MATERIAL AND METHODS :

**Collection of plants –**

Leaves of cleome gyandra were collected from mature plants. Syzygium aromaticum (Clove), Curcuma longa (Turmeric),Glycyrrhiza glabara (Liquorice),Sapindus mukorossi (Reetha),Menthol, Salt purchased from local market.

**Preparation of plant extract –**

- The leaves of cleome gynandra were collected from the mature plants and washed with water to remove dirt and dust.
- Leaves were kept in sterile container tray for 2-3 days.
- Then the leaves were pulverized by using mortar pestle under aseptic condition.
- The pulverized leaves were kept in air-tight sterile container.
- The pulverized leaves were weighed and transfer into100 ml sterile distilled water.
- The preparation was heat sterilized for about 5-10 minutes and then incubated at 37±2°C for 72 hour.
- After incubation, the herbal extract was filtered using whatmann filter paper.
- To prevent contamination, the herbal extracts are boiled again.
- After cooling the extracts it is ready to use for formulation of mouthwash.

## METHODS OF MOUTHWASH PREPARATION

- Four different extracts of herbal mouthwash were prepared.
- By using the formula of mouthwash the four main herbal ingredient- cleome gynandra, turmeric, clove, menthol.
- Then the other ingredients were added i.e.liquorice, salt. These were used for the preservation and for improving the taste.
- For the formulation, the ingredients used were in powdered form.
- 10 gram of each cleome gynandra, clove, turmeric, menthol were separately immersed into 100 ml of distilled water.
- Then incubated at 37°C for 48 hours.
- The herbal extract were filtered after incubation.
- All the extracts were then separately boiled and allow to cool
- 10 gram of each minor ingredients were added separately into 100 ml of distilled water
- All the extracts were mixed together

## FORMULATION OF HERBAL MOUTHWASH –

| Sr.No | Ingredients | F1 | F2 | F3 |
|---|---|---|---|---|
| 1 | Cleome gynandra (10g/100ml) | 3 ml | 2 ml | 4ml |
| 2 | Turmeric (10g/100ml) | 10 ml | 10 ml | 10 ml |
| 3 | Clove (10g/100ml) | 10 ml | 10 ml | 10 ml |
| 4 | Menthol (10g/100ml) | 5 ml | 5 ml | 5 ml |
| 5 | Liquorice (10g/100ml) | 5 ml | 5 ml | 5 ml |
| 6 | Reetha (10g/100ml) | 5 ml | 5ml | 5 ml |
| 7 | Salt (10g/100ml) | 5 ml | 5 ml | 5ml |
| 8 | Distilled water (10g/100ml) | 17 ml | 18 ml | 16 ml |

**Table: Formulation of herbal mouthwash**

## EVALUATION PARAMETER

### 1) Colour and Odour

By visual examination physical parameter like odour and colour were tested.

### 2) pH

Digital pH meter was used to determine the pH value. pH meter was calibrated by standard buffer about 1 ml of mouthwash formulation was weighed and dissolved in 50 ml of distilled water.

### 3) Test for microbial growth in formulated mouthwash

In agar media plate the formulated mouthwash was inoculated by streak plate method and a control was prepared. In the incubator plates were placed and incubated at 37±2°C for 24 hours. The plates are taken out after incubation period and checked for microbial growth by comparing it with control or standard.

### 4) Stability test

Stability test ensure that mouthwash formulation are much useful. Any formulation is incomplete without proper stability studies. Stability test which can maintain the same characteristics in the long term. Stability test

prior to antibacterial testing. This is done to determine physical and chemical stability of prepared formulation. So this is used to determine safety of formulation.

## RESULTS AND DISCUSSION

A mouthwash is stable in pH, color and odour for long time storage. It has anti-bacterial and anti-inflammatory action to overcome the dental diseases. The ingredients used in herbal mouthwash have been found to reduce plaque and gingivitis when integrate with daily brushing and flossing. It has been observed that antimicrobial test taken for mouthwash has activity such as inhibition of bacterial growth and depending on their concentration they have bactericidal and/or bacteriostatic properties.

### Physical and color stability analysis

The physical and chemical changes as been noted under the stability studies of the formulation. There was no microbial growth when inoculated in the agar medium. Formulation was split in half and incubated at different temperatures. At two different temperatures the formulation was kept to determine the optimum storage conditions; refrigerator at 12°C and at room temperature around 25°C. The visual appearance phase separation and homogeneity of the mouthwash were determined by ocular examination.

A light brown color rendered to the formulation which were stored in refrigerator and the formulation stored room temperature maintained the dark brown color. It did not experience any changes in color. The formulation with color change may experience the oxidation of the mouthwash ingredients. Phase separation was not observed in the mouthwash.

**Fig. Formulated herbal mouthwash**

| **Mouthwash formulation** | **Evaluation parameter** | **Observation** |
|---|---|---|
| F1 | Visual appearance<br>Phase separation<br>Homogeneity | Dark brown<br>Nil<br>Good |
| F2 | Visual appearance<br>Phase separation<br>Homogeneity | Dark brown<br>Nil<br>Good |
| F3 | Visual appearance<br>Phase separation<br>Homogeneity | Dark brown<br>Nil<br>Good |

**Table. The physical characteristics of different mouthwash prior to incubation**

| Storage temperature | Evaluation Parameter | Observation |
|---|---|---|
| 25°C | Visual appearance<br>Phase separation<br>Homogeneity | Dark brown<br>Nil<br>Good |
| 12°C | Visual appearance<br>Phase separation<br>Homogeneity | Light brown<br>Nil<br>Good |

**Table. Physical evaluation and stability studies**

## CONCLUSION

A study as been conducted to make an effective herbal mouthwash formulation. Cleome gynandra, turmeric, clove have been used due to their anti-bacterial activity. All natural herbs used in formulation is powerful healing agent which may overcome oral infection. The study shows that herbal mouthwash can serve as good compliment as standard marketed mouthwash. Present study shows that the formulation is effective and inexpensive herbal oral health intervention for low social economic communities.

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