

## Formulation and Evaluation of Herbal Mouthwash

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### ABSTRACT

Herbal mouthwashes are designed and prepared with extracts and essential oils from phytotherapeutic plants, containing a mixture of active ingredients that help for cleaning the mouth and teeth as well as freshening the mouth. Herbal mouthwashes have a major advantage over the chemically prepared mouthwash because of their non-irritating and non-staining properties. Herbal products not only help to control dental plaque, inhibit growth of bacteria, fresh breath, cleanse tooth but also show their anti-microbial and anti-fungal activity against human pathogen through decades. Herbal products and their extracts like babul, clove, neem, peppermint, turmeric have shown significant advantages over the chemical ones. It can be used safely by people at home using natural products. Diseases like dental caries and periodontal diseases at different stages of life can be controlled by it. The present study aimed to formulate the polyherbal mouthwash that has antibacterial properties.

**Keywords:** Natural products, Herbal mouthwash, Babul, Clove, Neem, Turmeric, Peppermint.

### I. INTRODUCTION

#### What is the importance of herbal mouthwash?

Nowadays people trust more on herbal products than chemical products because herbal products do not have any side effect and also show the effective result. They act on oral pathogens and relieve the pain instantly. The use of herbal mouthwashes has grown in advantage over the chemical mouthwashes due to their non-irritant and non-staining properties. They do not contain alcohol, sugar, artificial colours, stannous fluoride, artificial sweeteners, cetylpyridinium chloride (CPC), sodium lauryl sulphate (SLS), harsh chemical preservatives, dyes, etc. Use of oral mouthwashes is to improve oral hygiene.

The oral care product as we know them first appeared on the scene when toothpaste was developed in the 1800s

Mouthwash was the first mass produced commercially in the late 1800s

The first reference to mouth rinsing is in Ayurveda and Chinese medicine around 2700 BC.

### DEFINITION

Mouthwash is an aqueous solution that controls the plaque.

A medicated liquid which is held in mouth and swished by the action of perioral musculature to eliminate the oral pathogen is known as mouthwash.

A medicated liquid prepared by natural plant extracts like seeds, stem, roots, leaves, fruits and various tree oils, which is held in mouth and swished by the action of perioral musculature for the treatment of anti-bacterial infection is known as herbal mouthwash.

The herbal mouthwashes have naturally antibacterial and antifungal properties. Herbal mouthwashes show the very less side effect as compared to the chemical mouthwash. Now a days it is in high demand. It does not contain any severe additives like alcohol, sugar, artificial colours, dyes, cetylpyridinium chloride (CPC), harsh chemical preservatives, sodium lauryl sulphate (SLS), Stannous fluoride, etc.

### PRODUCTS USED IN THE PREPARATION OF HERBAL MOUTHWASH

#### 1. BABUL:

The plant part used in the preparation are leaves.

**BIOLOGICAL SOURCE:** Plant Vachellianilotica leaves used as herbal product.

**CHEMICAL CONSTITUENTS:** Iron, Protein, Zinc, threonine, lysine, leucine.

It helps to reduce the incidence of dental caries, periodontal disorders and prevents the accumulation of plaque. It is valuable in the management of various health conditions. According to Ayurveda it is helpful for kapha and pitta the gum pacifies vata, pitta and subsides urinary problems such as UTI, pain and bleeding of

the uterus. In this way the babool plays a very essential role in the preparation of herbal mouthwash.



Babul

Babul

## 2. CLOVE:

The plant product used in the preparation are dried flower buds.

**BIOLOGICAL SOURCE:** Plant *Eugenia caryophyllus* dried flower buds are used.

**CHEMICAL CONSTITUENTS:** Eugenol, methyl amyl ketone.

Helps to remove plaque, bacteria and inflammation. Clove not only relieve bad breath but also effective at fighting cavities. It stimulates circulation as well as help to reduce gum disease. It is good for dental health so for that it is used as a mouthwash.

Clove



## 3. NEEM:

The plant part used in the preparation are leaves.

**BIOLOGICAL SOURCE:** Plant *Azadirachta indica* dried leaves are used.

**CHEMICAL CONSTITUENTS:** Nimbinin, Nimbin, Nimbdin.

Neem extracts are appropriate for treating gingivitis and oral infections because of their antibacterial properties. This extract not only clean teeth but also inhibit the fungal infection. It soothes and protects, leaving even the most sensitive mouth feeling healthy, clean and refreshed. Improve oral protection. It used for centuries as a product in the mouthwashes.



Neem Leaves

## 4. PEPPERMINT:

The plant part used in the preparation are leaves.

**BIOLOGICAL SOURCE:** Plant *Mentha piperata* dried leaves are used.

**CHEMICAL CONSTITUENTS:** Menthone, cineole, menthol.

Peppermint extract has been shown to be superior to the mouthwash in inhibiting dental cavities. Powdered peppermint leaves have been used historically to freshen breathe and whiten teeth. It is an analgesic and antiseptic which also gives fragrance that's why it is very useful in dental care.



Peppermint

## 4. TURMERIC:

The plant part used in the preparation are dried rhizomes.

**BIOLOGICAL SOURCE:** Plant *Curcuma longa* dried rhizomes are used.

**CHEMICAL CONSTITUENTS:** Turmerone, curcuminoids, curcumin.

Turmeric shows so many benefits like, it has anti-inflammatory property, improve digestion, boost immune system, promote weight loss, prevention of cancer, helps in wound healing, helps to prevent arthritis, helps to control diabetes, detoxifies the liver, improves skin health. It show anti-bacterial, anti-microbial properties.



Turmeric

#### 5. COCO GLUCOSIDE:

Coco Glucoside is a non ionic surfactant that can be used as a foaming as well as cleansing agent to liquid cleansers. It has vegetable origin and it is

a natural and general product.

#### 6. SALT:

Rinsing the mouth with a NaCl solution is an old remedy believed to promote healthy gums and encourage recovery from mouth ulcers. It gives excellent short term treatment for the wounds in the mouth. They are not only natural disinfectant but also removes swelling from the tissues.

#### 7. WATER:

Distilled water is mainly used in the herbal mouthwashes. Use of water in the mouthwash for the addition of sweetener, surfactant, preservative, some colouring and flavouring agent. There are so many use of water in the mouthwash that's why it plays a very important role in it.

TABLE OF THE COMPONENTS IN HERBAL MOUTHWASH

#### 1.1 LIST OF COMPONENTS:

Sr. no.	Components	SCIENTIFIC NAME	CHEMICAL CONSTITUENTS	USE
1	Babul	Vachellianilotica.	Protein, Zinc, threonine	Prevents accumulation from plaque.
2	Clove	Eugenia carryophyllus	Mthyl amyl ketone	Stimulate circulation, Inhibitbad breath.
3	Neem	Azadirachtaindica	Nimbin, Nimbinin	Soothing teeth, antiseptic
4	Peppermint	Mentha pepperata	Menthol	It gives fragrance.
5	Turmeric	Curcuma longa	Curcumin	Bacteriostatic, Bacteriocidal, Anti-microbial
6	Coco glucoside	-	-	Surfactant
7	Salt	-	-	Preservative
8	water	-	-	-

#### 1.2 LIST OF MATERIALS:

Sr. no.	Materials
1	Babul
2	Clove
3	Neem
4	Peppermint
5	Turmeric
6	Coco glucoside
7	Salt
8	Water

### 1.3 LIST OF APPARATUS

Sr. no.	Apparatus
1	Beaker
2	Mortar and Pistle
3	Beaker
4	Funnel
5	Conical Flask
6	Burner
7	Petri dish
8	Water bath
9	pH meter
10	Incubator

### METHOD OF PREPARATION:

- Four different extracts of polyherbal mouthwash were developed.
- The mouthwash formula made and the four main herbal ingredients are used: Clove, Turmeric, Neem, Peppermint.
- Three minor ingredients are added which are: Babul, coco glucoside, salt. The minor components were used for the preservation and for improving the action.
- In order to test the anti-bacterial activity of the mouthwash herbs, different percentage of herbal extract were prepared.
- For the formulation, the mouthwash herbal components were grind to obtain their powder form.
- 10 gm of each Neem, Clove, Peppermint, Turmeric were separately soaked into 100mL of distilled water and incubated at 37 degree C for 48 hours.
- After incubation, the herbal extracts were filtered.
- Then the extracts were boiled separately and let it cool.
- 10gm of each solid minor ingredients were added separately into 100 mL of distilled water.
- After the ingredients extracts cool down, the minor and major components were mixed which shown in following formulation table 1.4 .

### 1.4 FORMULATION TABLE:

Sr. no.	Components	F1 ml	F2 ml	F3 ml	F4 ml	F5 ml
1	Neem (10gm/100ml)	8	6	5	3	5
2	Turmeric (10gm/100ml)	5	10	10	5	5
3	Clove (10gm/100ml)	2	5	5	10	4
4	Peppermint (10gm/100ml)	10	5	5	7	10
5	Babul (10gm/100ml)	7	10	5	10	5
6	Coco glucoside (10/100ml)	5	4	7	2	5
7	Salt Solution (10gm/100ml)	10	5	3	8	10
8	Distilled Water	3	5	10	5	6
9	Total volume	50	50	50	50	50

## EVALUATION

### 1. Stability Test:

There are five main facets which determine the stability of product: Chemical test, Physical test, Therapeutic test, toxicological test were performed. This aims to ensure that the mouthwash formulations are useable and can maintain the same characteristics in the long term, before undergoing antibacterial assay. Different mouthwash formulations were subjected to stability test prior to antibacterial testing. The purpose of stability testing is to provide evidence on how the quality of a drug substance or drug product varies with time under the influence of a variety of environmental factors such as temperature,

humidity and light and to establish a re-test period for the drug substance or a shelf life for the drug.

**pH Stability:** This test is monitored using a well calibrated pH meter. Performed to investigate the changes and variability in the pH readings. The mouthwash formulations then keep on the shelf and in the refrigerator.

**Physical Stability:** Physical stability test is performed for recording the visual appearance, physical separation and homogeneity of the formulated mouthwash. After the performance the appearance is checked in different temperature and result was recorded.

### OBSERVATION TABLE:

Mouthwash formulation	Evaluation parameter	Observation
F1	Visual appearance Phase separation Homogeneity	Dark brown Nil Good
F2	Visual appearance Phase separation Homogeneity	Dark brown Nil Good
F3	Visual appearance Phase separation Homogeneity	Dark brown Nil Good
F4	Visual appearance Phase separation Homogeneity	Dark brown Nil Good
F5	Visual appearance Phase separation Homogeneity	Dark brown Nil Good

## II. RESULT AND DISCUSSION:

- Five different formulations were performed. Each formulation was then split in half and incubated at two different temperatures: in the refrigerator at 12 degree C and at room temperature at around 25 degree C.
- Two different temperature were chosen to determine the optimum storage conditions for the mouthwash formulation in which they were maintain their activity for the longest time possible. The visual appearance phase separation and homogeneity of each formulation were monitored by ocular examination.
- Expectantly the colour of mouthwash should be maintained throughout the experimental phase to ensure that the mouthwash formulations were acceptable. Mouthwash formulations were stored in refrigerator rendered a light brown colour throughout the experiment, were as those kept at room temperature maintained at dark brown colour.
- Although the herbs that were used in mouthwash ingredients have natural antioxidants, the low storage temperature might have disable their anti-oxidant machinery which leads to change in coloration thus lower temperature storage might affect the colour stability of the mouthwash formulation. Phase separation was not observed in all tests.



### III. SUMMARY AND CONCLUSION:

Herbs are powerful healing agent, must be used appropriately. The use of herb in dentistry should be based on evidence of effectiveness and safety. They will improve the immunity and help in healing of oral infections.

An attempt has been made to outline some of the commonly available herbs and, plants, which are readily available and can be used as effective mouthwashes by all.

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