



# A Research on: Formulation and Evaluation of Herbal Toothpaste

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## Abstract: -

The major goal of the research is to formulation and evaluation of herbal toothpaste. Toothpaste is typically used product with the aid of using all individuals. Toothpaste is normally used for cleansing of enamel and mouth. It is likewise used to deal with many issues of enamel. Many dentists propose to apply toothpaste to deal with disease like sensitivity, Chronic gingivitis etc.

Herbal formulation of toothpastes is by prepared using herbs like Neem leaves, Black pepper, Babul leaves, Clove oil, Turmeric.

These herbal toothpastes is evaluated by different tests like Physical Examination, pH determination, Homogeneity, Sharp and edge abrasive particles, Determination of moisture and volatile matter, Spreadability, Stability study, Extrudability etc.

The aim of this research is to formulate herbal toothpaste that good for oral hygiene & gum bleeding.

**Keyword:** - Herbal ingredient, Herbal Toothpaste, Antibacterial activity, Neem leaves, black pepper, Babul leaves, Abrasive.

## Introduction: -

Toothpastes are the maximum preventive approach in oral fitness care. Many commercially to be had dentifrices declare to have antimicrobial properties, however little studies have been performed to analyze those claims. It is properly understood that greater than 2000 years back, we've got accompanied to perform the usage of dentifrices as a enamel cleansing exercise and toothpicks and brushes remains to be as even older exercise. Today's dentifrices follow many of the same concepts that were developed centuries ago. Use of natural or Ayurvedic medicines for normal fitness in preferred and oral fitness is an fundamental a part of Indian tradition. Many ayurvedic toothpastes are to be had in the marketplace claiming to have excellent antimicrobial properties [1].

Toothpastes are used almost universally in the developed world but, in some groups and cultures, people still practice traditional tooth brushing without dentifrice with, for example, a miswak or salt. Dentifrices (toothpastes) have been used since antiquity but recently, formulations which deliver active compounds aimed at preventing and/or treating oral diseases have been developed. The history of toothpastes is reviewed elsewhere [2].

Herbal drug treatments are stated the use any a part of the flora for recovery and treating sicknesses functions. Herbal drug treatments were used extensively for the duration of human records and in step with World Health Organization (WHO) approximately 80% of the human populace used natural medicinal drug for number one healthcare. In addition, extra than 35,000 plant species were suggested for use in diverse human cultures round the arena for scientific functions. Some of them are mighty antimicrobial, antidiabetic, antiviral, anticancer and antifungal. In every other word, oral hygiene is the exercise of maintaining the mouth and tootheasy to save you dental problems, maximum commonly, dental cavities, gingivitis, periodontal (gum) sicknesses and horrific breath. One of the functions to keep oral hygiene is to save you oral infections. The oral infections are due to plaque forming microorganism and yeast [3].

Neem has antibacterial and anti-inflammatory properties. Neem additionally has anti caries properties. The antimicrobial outcomes of neem were said towards *S.mutans* and *S.faecalis* . Dried chewing sticks of neem indicates most antibacterial interest towards *S.mutans*. There is constrained research to be had concerning the efficacy of natural dentifrices subsequently the existing take a look at turned into undertaken to evaluate their impact on oral hygiene and gingival bleeding [4].

Toothpaste protects, cleans and polishes enamel. It makes oral hygiene greater efficient. It has a clean flavour and smell and freshen the breath. Brushing two times an afternoon with toothpaste is crucial to keeping a wholesome mouth [5].

The major goal of the research is to formulation and evaluation of herbal toothpaste. Toothpaste is typically used product with the aid of using all individuals. Toothpaste is normally used for cleansing of enamel and mouth. It is likewise used to deal with many issues of enamel. Many dentists propose to apply toothpaste to deal with disease like sensitivity, Chronic gingivitis etc.

### **Ideal Properties of Toothpaste: -**

It should not be harmful to the oral tissue & fluid. It should not stain teeth.

It should not be scratching to the enamel surface of tooth. If it is ingested, it should not be harmful to the G.I.T.

It should have pleasant odour & taste.

## **MATERIALS AND METHODS: -**

### **Chemical: -**

1. Calcium carbonate, 2. Salt, 3. Camphor, 4. Sodium laurylsulfate , 5. Methyl paraben

### **Plant collection: -**

The following ingredients are collected from P.P.C.O.P campus, local area and local market.

1. Neem leaves
2. Black pepper
3. Babul leaves
4. Clove oil
5. Turmeric
6. Mint

### **Formulation: -**

There are two types of toothpaste formulation procedures, viz. 1. Dry gum method, 2. Wet gum method,

#### **Dry gum method: -**

Preparation of base

1. The solid ingredients calcium carbonate, sodium lauryl sulphate, Salt, Camphor, Methyl paraben were weighed accurately as mentioned in the formula and sieved with sieve no.80 to maintain the particle size.
2. These ingredients were also mixed in a mortar and pestle, then triturated with precisely weighed clove oil until a semisolid substance was created.
3. Addition of herbal ingredients
4. Accurately weighed herbs powder of neem leaves, babul leaves and black pepper were added to the base
5. Then addition of turmeric as a flavouring agent
6. At the end, peppermint oil was added as a flavour [6].

#### **Making of herbs powder: -**

1. First wash the neem leaves, babul leaves and black pepper with water
2. After the washing of dry the herbs in the shade presence of sunlight for 2 or 3 days
3. When the herbs are dried then they are grinding in a grinding machine separately
4. The grinding of herbs should be fine in size

5. Then the obtain powder is pass through the 80.no sieve

6. The store in tightly close container [7].

### Composition: -

All ingredients should be complied with the Indian standards. Toothpaste is not composed of mono or disaccharides such as sucrose or fermentable carbohydrates

**Table 1: Composition table of Herbs: -**

Sr.no	Ingredient	Quantity(g)	Use
1.	Neem leaves	0.5	Antibacterial
2.	Black pepper	0.5	Antioxidant
3.	Babul leaves	0.5	Astringent
4.	Clove oil	0.5	Anti-inflammatory
5.	Turmeric	0.5	Colourings agent
6.	Peppermint oil	0.5	Flavouring agent

**Table 2: Composition table of chemicals: -**

Sr.no	Ingredient	Quantity(g)	Use
1.	Calcium carbonate	4.0	Abrasive
2.	Salt	0.5	Abrasive
3.	Camphor	0.5	Antiseptic
4.	Sodium lauryl sulfate	0.5	Foaming agent
5.	Methyl paraben	0.5	Preservative
6.	Water	q.s	Vehicle

### Evaluation of Toothpaste: - [8][9][10][11]

## 1. Physical Examination

- Colour- Formulated toothpaste was evaluated for its colour.
- The visually colour was checked.
- Odour- Odour was found by smelling the product
- Taste- Taste was checked manually by tasting the formulation

## 2. pH

PH of formulated herbal toothpaste was determined by using pH meter. 10g of toothpaste placed in 150ml of beaker. Allow the 10ml of boiled and then cooled water. Stir vigorously to make a suspension.

## 3. Homogeneity

The toothpaste shall extrude a homogenous mass from the collapsible tube or any suitable container by applying of normal force at  $27 \pm 20^\circ\text{C}$ . In addition bulk of contents shall extrude from the crimp of container and then rolled it gradually.

## 4. Sharp and edge abrasive particles

To verify for the presence of any sharp or abrasive particles, the contents were placed on the finger and scratched on the butter paper for 15-20cm. I went through the same process at least ten times. There were no sharp or edge abrasive particles discovered.

## 5. Determination of moisture and volatile matter

5gm of herbal toothpaste was placed in a porcelain dish with a diameter of 6-8cm and a depth of 2-4cm to determine moisture and volatile matter. At 105 degrees Celsius, it was dried in an oven.

### Calculation

$\% \text{ by mass} = 100 \frac{M_1}{M}$ ,  $M_1$ - Loss of mass (g) on drying  $M$ - Mass (g) of the material taken for the test.

## 6. Spreadability

About 1 gm of tooth paste is weighed at the center of glass plate (10x10 cm) and another glass plate is placed over it carefully. At the center of the plate a 2 kg weight is placed. After 30 minutes, the diameter of the paste is measured in cm. The experiment is repeated thrice and average diameter is determined.

## 7. Stability study

The toothpaste shall be stable, but not to be deteriorating, ferment and segregate during normal storage conditions and usage. Stability of toothpaste can be tested when it exposes to  $45 \pm 20^\circ\text{C}$  for a period of 28 days. After storage, no phase separation, fermentation and gassing can be observed. Also exposed to cool conditions such as  $5^\circ\text{C}$  for 1 hour, no obstruction of extrudable form from the container is observed.

## 8. Extrudability

In this method, the formulated paste was filled in standard capped collapsible aluminum tube and sealed by crimping to the end. The weights of tubes were recorded. The tubes were placed between two glass slides and were clamped. 500g was placed over the slides and then cap was removed. The amount of the extruded paste was collected and weighed. The percent of the extruded paste was calculated.

## 9. Foamability

The foamability of formulated toothpaste evaluated by taking small amount of formulation with water in measuring cylinder initial volume was noted and then shaken for 10 times. Final volume of foam was noted

## RESULT AND DISSCUSSION: -

### Physical Examination: -

Sr. No	Parameters	Observations
1.	Colour	Greenish
2.	Odour	Characteristic
3.	Taste	Characteristic
4.	Smoothness	smooth

### Evaluation results: -

Sr. No	Parameters	Observations
1.	pH	7
2.	Homogeneity	Good
3.	Abrasiveness	Good
4.	Foamability	10ml
5.	Moisture content	15%
6.	Extrudability	90.37
7.	Spreadability	3.5 cm/sec
8.	stability	Stable

**Extrudability: -**

Sr. No	Extrudability	Mean of tree tube
1.	Net wt. of formulation in tube (g)	13.5
2.	Wt. of toothpaste extruded (g)	12.2
3.	Extrudability amount percentage	90.30

**CONCLUSION: -**

Herbal toothpaste shows the good action to maintaining the dental caries and oral hygiene. The herbal toothpaste shows the safer minimum side effects. The formulated herbal toothpastes is evaluated by different tests like Physical Examination, pH determination, Homogeneity, Sharp and edge abrasive particles, Determination of moisture and volatile matter, Spreadability, Stability study, Extrudability etc.

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