



# FORMULATION OF HERBAL TOOTHPASTE

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## Abstract:-

The herbal toothpaste is prepared by using herbal extract cinnamon, neem, babul, guava and the other ingredient calcium carbonate, sodium lauryl sulphate, glycerin, gum tragacanth, water, saccharin, flavor and preservative. The herbal extract gives antimicrobial and antiinflammatory activity and prevent and reducing the tooth decay, dental caries and given to freshness of mouth. The formulated herbal toothpaste is compare with marketed toothpaste they gives beneficial action and safety. The observation are found to be from physical examination appearance, spread ability, relevant density, viscosity, pH, homogeneity, foam ability, determination of moisture and volatile matter, antibacterial activity and Extrudability. The herbal toothpaste is no side effect and they prevent dental caries and dental disease.(1,3)

An herbal toothpaste with babool and neem extracts offers natural cleansing and antimicrobial properties. Babool helps strengthen gums, while neem fights bacteria and promotes oral health. Together, they provide a refreshing and effective alternative to traditional toothpaste. The herbal toothpaste combines the benefits of babool and neem extracts, renowned for their oral health properties. Babool, also known as *Acacia arabica*, has been used traditionally to strengthen gums and prevent dental issues. Neem, scientifically known as *Azadirachta indica*, is recognized for its antibacterial and anti-inflammatory properties, which help combat plaque and gum disease. This herbal blend provides a natural solution for maintaining oral hygiene and promoting gum health.(4,5,6)

**Keywords:** herbal toothpaste, standardization, evaluation and comparison with marketed preparation

**Introduction:-**

The best preventive measure for keeping up with dental wellbeing is utilizing toothpaste. Numerous business toothpastes guarantee to have antibacterial characteristics, yet not much exploration has been finished to assess those cases. It is notable that over a long time back, people were went with to involve dentifrices as a strategy for cleaning polish, while toothbrushes and toothpicks are still as older individuals work out. Large numbers of the ideas utilized by dental specialists today were made many years ago. back then. Utilizing home grown or Ayurvedic drugs to keep up with customary oral and actual wellness is a fundamental part of Indian traditions. There are a ton of ayurvedic toothpastes accessible in stores. professing to have predominant antibacterial qualities.(7)

In the created world, toothpaste is essentially generally utilized, yet in numerous networks and societies, tooth brushing is as yet done as our forefathers would have done it utilizing salt or a miswak rather than toothpaste. Since antiquated times, toothpastes have been utilized as dentifrices; in any case, more as of late, definitions that give dynamic There are presently substances available intended to fix or forestall issues of the mouth. The foundation of toothpastes have been explored somewhere else.(8,14)

Any piece of the vegetation is supposed to be utilized in natural medicine treatments for mending and disease capabilities. All through mankind's set of experiences, home grown medication has been broadly used, and as per the World Wellbeing Association (WHO), practically 80% of individuals have involved regular drug for the most ideal medical care. Besides, in excess of 35,000 plant species were suggested for use for logical purposes across a scope of human societies. A couple of them are very strong. antifungal, antiviral, anticancer, antidiabetic, and antimicrobial. In any remaining terms, dental wellbeing is the practice of keeping your mouth and teeth beneficial to forestall dental issues, most often, dental teeth rot, periodontal illnesses, gum disease, and foul breath. One of the capabilities to keep oral cleanliness is to save you oral contaminations. The oral diseases are because of plaque shaping microorganism and yeast. Neem contains calming and antibacterial characteristics. Neem likewise contains hostile to caries properties. Neem has been displayed to have antibacterial properties against *S. mutans* and *S. faecalis*. The antibacterial action of dried neem biting sticks is most elevated against *S. mutans*. There are restrictions There is still examination to be finished on the viability of regular dentifrices after the ongoing review turned into an undertaking to survey their effect on gingival draining and dental cleanliness.

Lacquer is safeguarded, cleaned, and cleaned with toothpaste. It builds the adequacy of dental cleanliness. It scents and tastes clean and assists with invigorating breath. Utilizing toothpaste and brushing two times an evening is fundamental for keeping up with great oral wellbeing.(14,18)

**Aim:-**

To develop a natural, effective, and safe toothpaste formulation using neem (*Azadirachta indica*) and babul (*Acacia arabica*) to promote oral health and hygiene.

**Objectives:-**

- 1) **Utilize Natural Ingredients:** Incorporate neem and babul extracts, known for their medicinal properties, to create a toothpaste free from synthetic chemicals.
- 2) **Promote Oral Hygiene:** Enhance the overall oral hygiene by leveraging the antibacterial, anti-inflammatory, and antimicrobial properties of neem and babul.
- 3) **Prevent Dental Problems:** Formulate a toothpaste that helps in the prevention of common dental issues such as cavities, plaque formation, gum diseases, and bad breath.
- 4) **Ensure Safety and Efficacy:** Ensure that the herbal toothpaste is safe for daily use and effective in maintaining dental health through clinical testing and user feedback.
- 5) **Cater to Natural Product Demand:** Meet the growing consumer demand for natural and herbal products in dental care.
- 6) **Environmental Sustainability:** Develop an eco-friendly product by utilizing sustainable sourcing and manufacturing processes for the herbal ingredients.
- 7) **Cost-Effectiveness:** Provide an affordable alternative to conventional toothpastes without compromising on quality and efficacy.
- 8) **Market Research and Acceptance:** Conduct market research to understand consumer preferences and acceptance of herbal toothpaste and adapt the formulation accordingly.

**Formulation:-**

**Chemical:-** Calcium carbonate, Sodium lauryl sulfate (Loba Chemicals), Glycerine, Gum tragacanth, Sacchaeine.

**Formula**

Sr.no.	Ingredients	Concentration(gm)	Uses
1	Calcium carbonate	28.0	Abrasive
2	Sodium lauryl sulfate	0.5	Detergent &foaming agent
3	Glycerine	11.0	Thickening agent
4	Gum tragacanth	0.75	Emulsifier
5	Water	9.5	Vehicle
6	Sacchaeine	0.05	Sweeten low- calories candies
7	Flavour	Qs	To improve the taste

8	Preservative	Qs	Enzymes
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**Table1:** Composition of toothpaste

**Plan Of Work:-**

**1) Preparation of Herbal Ingredients:**

- If using powder form, ensure neem and babul are finely ground.
- If using extract, ensure they are prepared and concentrated properly.

**2) Mixing Base Ingredients:**

- Combine abrasive, humectants, and binding agents in a large mixing vessel.
- Mix until a smooth base is formed.

**3) Incorporating Herbal Components:**

- Add neem and babul to the base mix, ensuring even distribution.
- Continue mixing until fully incorporated.

**4) Adding Surfactants, Flavors, and Sweeteners:**

- Add surfactants to enhance the foaming action.
- Introduce flavors and sweeteners, adjusting to desired taste.

**5) Incorporating Preservatives:**

- Add preservatives to ensure stability and prevent microbial growth.

**6) Final Blending and Homogenization:**

- Mix the formulation thoroughly to ensure a consistent texture and color.
- Use homogenization if required to achieve a smooth consistency.

**7) Quality Control and Testing:**

- Test for pH, consistency, texture, and microbial contamination.
- Conduct sensory tests to ensure taste and usability meet standards.

## 8) Packaging:

- Fill the toothpaste into tubes or containers.
- Ensure packaging is sealed properly to prevent contamination.

## 9) Labeling and Compliance:

- Label the product with all necessary information, including ingredients, instructions, and safety warnings.
- Ensure compliance with local regulations and standards.

Sr. No.	Plant extract	Ingredient quantity(gm)
1	Neem stem & bark	2.5
2	Babul leaves	2.5
3	Gauva leaves	2.5
4	Cinnamon	2.5

**Table2:** Plant extracts

## #Material And Methods:-



**Ingredient-** Neem stem &bark

**Biological Name-** Azadirachta indica(Meliaceae).

**Use-** Antibacterial



**Ingredient-** Gauva leaves

**Biological Name-** Psidium guajava(Myrtaceae).

**Use-** Anti-inflammatory



**Ingredient-** Babul leaves.

**Biological Name-** Acacia arabica(fabaceae).

**Use-** Astringent



**Ingredient-** Cinnamon

**Biological Name-** Cinnamomum zeylanicum(Lauraceae).

**Use-** Flavouring agent

## # Evaluation and comparison of Herbal Toothpaste

### 1). Physical Examination (Colour, odour, taste, smoothness, relative density):

Formulated toothpaste was evaluated for its colour, visually colour was checked. Odour was found by smelling the product. Taste was checked manually by tasting the formulation. The Smoothness was tested by rubbing the paste formulation between the fingers.

### 2). Inertness of tube:

The container used for herbal toothpaste was not produce any corrosion or deterioration in normal storage conditions like heating temperature at  $45\pm 2$  0C for ten days. Inertness of tube was observed by cutting the internal surface, open it and observing whether any sign of deterioration or chemical reactions occurred in the container.

### 3. pH:

Dispense 10 gm of the toothpaste from the container in a 50 mL beaker and add 10 mL of freshly boiled and cooled water (at 270C) to make 50 percent aqueous suspension. Stir well to make a thorough suspension. Determine the PH of the suspension within 5 min, using a PH meter.

### 4. Homogeneity:

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

### 5. Determination of sharp and edge abrasive particles:

The contents on to the finger and scratched on the butter paper for 15-20cm long to check for the presence of any sharp or abrasive particles. Repeated the same process for at ten times. No sharp or edge abrasive particles were found.

### 6. Foamability:

The foaming power (Foamability) of herbal toothpaste was determined by taking 2g of toothpaste with 5ml water in measuring cylinder initial volume was noted and then shaken for 10 times. Final volume of foam was noted.

### 7. Determination of moisture and volatile matter:

Moisture and volatile matter was determined by using 5gm of herbal toothpaste was placed in a porcelain dish of about 6-8cm in diameter and 2-4cm in depth. Dried in an oven at 1050C. Calculations:

$$\% \text{ by mass} = 100MI / M$$

MI -Loss of mass (g) on drying

M- Mass (g) of the material taken for the test.

## 8. Determination of Spreadability:

For determination of Spreadability method slip and drag characteristic of paste involve. The about 1-2g of herbal toothpaste was weighed and placed between two glass slides (10 x 10cm) one over each other (sliding, shall not take place), and the slides were pulled in opposite direction. Measure the spreading (in cm) of the toothpaste after 3 minutes. Repeating the experiment and noted the average value of three readings.

## 9. Anti-Microbial Activity:

In-vitro anti-bacterial study of formulated paste was performed by disc diffusion method by using Soyabean casein digest medium against a pathogenic bacterial strain E coil. E coil was initially cultured cells were tend to multiple in the agar plates. Initially plates were streaked with inoculum, bores were made with 5mm diameter into the medium using a sterile cork borer.

The surface of the agar plate was rotated to ensure an equal distribution of inoculums present around the bore. Then the formulated paste and marketed formulations were placed in the bores on the cultured plates. The plates were wrapped with paraffin, labelled, and incubated at 37°C for the 24 hour. Each plate was examined after incubation for 24 hrs. The diameter of zone of inhibition (ZOI) was measured in millimeters (mm) with a ruler. (19,24)

### Result:

The herbal toothpaste formulation was prepared from natural ingredients (neem, babul, amrud leaves) and a small number of synthetic ingredients. At the trial phase of formulation, three batches were performed due to the problem like homogeneity, spreadability and foamability the two batches discarded permanently, and the only single batch was selected for next steps. The formulated herbal toothpaste is greenish brown in color.

### Conclusion:

Following conclusion can be drawn from the results obtained in the present work of investigation. This herbal toothpaste is having prominent function in the maintaining the oral hygiene and preventing dental caries and are safer with minimum side effect than chemical based synthetic toothpaste. All the marketed herbal toothpaste and lab-made had been evaluated and compared with the standards specified by Bureau of Indian standards. Formulated toothpaste is capable to maintain the tooth and oral hygiene and shows antimicrobial activity against microbes like E. coli. Evaluation and comparison of results with commercial Herbal toothpaste are demonstrated that formulated herbal toothpaste is having equal helpful and fascinating over the marketed formulations (Colgate Vedshakti, Dabur Meswak, Patanjali Dantkanti and Dabur red). This preliminary in-vitro study demonstrated that Herbal toothpaste was equally efficacious as marketed popular toothpastes in terms of all evaluation properties of toothpaste. The formulated herbal toothpaste has good scope in the future by increasing natural ingredients for manufacturing more and safer natural remedies, in the research and health of dental care of public, society and nation. It is concluded that formulated Herbal toothpaste was found to be of good quality.

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