

Formulation And Evaluation of Polyherbal Toothpaste for Treatment of Oral Disease

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Abstract

Toothpaste is a gel or paste that is used with a toothbrush to maintain good oral hygiene. This study's objective is to develop and assess polyherbal formulation of toothpaste. However, some of these substances have unfavorable side effects, like tooth discoloration and altered eating tests. The goal of the current study is to identify undesired side natural components in these medications. Neem leaves, cloves, mango peels, honey, glycerin, guava leaves, and acacia powder are the six plant samples used in this experiment. which were used to clean teeth in the past. A gel formulation of lab-made herbal toothpaste was created using natural and appropriate ingredients, and it was discovered to be more steady. Therefore, in vitro research indicates that lab-made polyherbal toothpaste was of good quality when compared to commercial formulations.

Key Words

Neem (*Azadirachta indica*), Tulsi (*Ocimum sanctum*), Clove Oil, Babool, Mint, Aloe vera Gel, Activated Charcoal

1.Introduction

Since ancient times, toothpaste has been a staple of oral health care. The plant known as neem have been assessed for their antibacterial properties since ancient times, and the goal of contemporary study is to create polyherbal toothpaste². Neem leaves, guava leaves, honey, acacia, and mango peel are examples of plant extracts that have antibacterial properties. Herbal toothpaste was created to meet all the conditions needed to keep the mouth healthy and stop bacterial tooth decay. The polyherbal toothpaste formulation was contrasted with commercial preparation⁵.

Gingivitis, tooth decay, cavities, gum bleeding, and other dental conditions can all be treated with this toothpaste. Toothpaste cleans, shields, and Shining teeth. It improves dental hygiene, tastes and smells fresh, and makes breathing easier.

Toothpaste is a dental preparation that is used as an accessory with a toothbrush to keep teeth clean and healthy². The use of many herbs in a therapeutic preparation is known as polyherbal formulation. Toothpaste is a gel or paste formulation that is used to maintain and improve oral hygiene³.

In humans and animals, antibiotics like amoxicillin and gentamicin have been shown to successfully prevent dental caries, but they have never utilized in therapeutic settings due to numerous negativeOne of the earliest structured medical systems is Indian medicine¹.

2.Types of Polyherbal Toothpaste

Based on benefits

- **Anti-cavity:**

Formulations may include ingredients like neem and clove which are reported to have antibacterial properties that combat cavity-causing bacteria.

- **Anti-plaque and gum health:**

These toothpastes use herbs like neem, guava, and holy basil to help reduce plaque, gingivitis, and gum bleeding.

- **Sensitivity relief:**

While less common, some polyherbal toothpastes aim to reduce sensitivity by combining ingredients that soothe the nerves and protect against pain triggers.

- **Antimicrobial / Antibacterial Activity:**

Effectively reduces the growth of harmful oral bacteria, such as *Streptococcus mutans*, the primary cause of plaque and dental caries (cavities).

- **Anti-inflammatory Activity:**

Helps to prevent and reduce gum inflammation, managing conditions like gingivitis and soothing discomfort.

- **Astringent and Gum-Strengthening Effects:**

Ingredients like amla or acacia can have astringent properties, which help tone and strengthen gum tissue.

- **Analgesic Properties:**

Certain ingredients (e.g., clove oil containing eugenol) can provide natural pain relief for toothaches or gum sensitivity.

- **Breath Freshening:**

Should effectively keep the mouth clean and impart a natural, long-lasting fresh breath and a pleasant aftertaste.

3. Drug Profile

A. **Neem**

- Biological name – *Azadirachta indica*
- Common name – Neem, Nimba, margosa tree
- Synonyms – *malia azadirachta*
- Kingdom – Plantae
- Family – Meliaceae
- Genus – *Azadirachta*
- Species – *Azadirachta indica*



Fig.1. Neem Powder

B. **Clove Oil**

- Biological name - *Syzygium aromaticum*
- Common name - Clove, Clove oil (from dried flower buds)
- Synonyms (Botanical) - *Eugenia caryophyllata*, *Caryophyllus aromaticus*, *Eugenia aromatica*
- Kingdom - Plantae
- Family: - Myrtaceae
- Genus - *Syzygium*
- Species – *aromaticum*



Fig.2.Clove Oil

C. Tulsi

- Biological name – *Ocimum tenuiflorum* (*Ocimum sanctum*)
- Common name – Tulsi, Holy Basil
- Synonyms – *Tulasi*, *sacred basil*
- Kingdom – Plantae
- Family – Lamiaceae
- Genus – *Ocimum*
- Species – *Ocimum tenuiflorum*



Fig.3.Tulsi Powder

D. Mint

- Biological name - *Mentha spicata*
- Common name - Mint, Pudina
- Synonyms (Botanical) - *Mentha viridis*, *Mentha piperita*
- Kingdom - Plantae
- Family- Lamiaceae
- Genus - *Mentha*
- Species- *spicata*



Fig.4. Mint Oil

E. Aloe vera Gel

- Biological name – *Aloe vera (L.) Burm.f.*
- Common name – Aloe vera, Ghritkumari, Aloe
- Synonyms – *Aloe barbadensis miller, aloe indica royle*
- Kingdom – Plantae
- Family – Asphodelaceae
- Genus – *Aloe*
- Species – *Aloe vera*



Fig.6.Aloevera Gel

4. Material and Method

5. Conclusion

Sr. No.	Ingredients	Quantity (gm)	Role in the formulation
01	Neem	2gm	Antibacterial
02	Clove Oil	0.5ml	Analgesic, Antiseptic
03	Tulsi	1gm	Soothing
04	Mint	6-7 drop	Flavouring, Freshness
05	Sodium Benzoate	0.1gm	Preservative
06	Glycerin	8ml	Humectant
07	Camphor	0.1gm	Antiseptic
08	Calcium Carbonate	25gm	Mild Abrasive, Cleaning Agent
09	Sorbitol	6gm	Sweetner, Moisture Retention
10	Sodium Lauryl Sulfate	1gm	Foaming Agent
11	Distilled Water/ Rose Water	q.s.	Thickening Agent
12	Aloe vera Gel	5ml	Healing and Soothing
13	Activated Charcoal	2gm	Mild Abrasive

Herbal toothpaste is a compelling alternative to conventional dental care products because it combines the benefits of natural ingredients with advantageous oral health properties. Numerous herbal components have been shown to have potent antibacterial, antioxidant, and anti-inflammatory qualities. These consist of neem, walnut shell, and tamarind seed.

mustard oil, clove oil, and cinnamon oil. These characteristics not only help prevent dental issues like cavities and gum disease, but they also enhance overall oral hygiene by promoting healthier gums and reducing inflammation.

Additionally, consumers' growing preference for natural and sustainable products emphasizes the importance of herbal toothpaste in the current market. Herbal remedies offer a comprehensive approach to dental care, appealing to people seeking natural substitutes as concerns about artificial additives and antibiotics

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