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## Formulation Development and Evaluation of Herbal Tooth Powder

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**Abstract:**

Dentifrices are essential for maintaining good dental hygiene and wellness in daily life. Periodontal disorders, plaque, and gingivitis are the important tooth-related issues. These serious problems are the result of improper oral hygiene practises and disregard for proper teeth care. By resulting in gum tissue irritation, this carelessness promotes plaque accumulation on teeth and ultimately results in gingivitis and tooth loss. Due to the use of chemicals, the majority of synthetic dentrifice products, including toothpowder and toothpaste, induce adverse effects such gum irritation, canker sores, burning, and inflammation. With the formulation of herbal toothpowder utilising Indian nettle, Coconut spathe, Tulsi, Black jeera, Khair, Liquorice, Pepper, Camphor, Peppermint, Activated charcoal, and Rock salt, an attempt is made in this study to provide a substitute for the consumers. As part of the current investigation, the organoleptic, physical, and phytochemical evaluations of the herbal toothpowder were analysed in order to create and standardise the toothpowder.

**Keywords:**

Herbal toothpowder, Indian nettle, Coconut spathe, Tulsi

**INTRODUCTION**

Maintaining good looks, a positive impression of oneself, and giving confidence all depend on good oral hygiene. In addition to promoting oral health, tooth powder acts as an abrasive to assist remove food particles and dental plaque from the teeth. It also helps to ward off conditions including gingivitis, cavities, and discoloured teeth. The use of tooth powder as a prophylactic cosmetic for teeth can help to prevent foul breath and tooth decay. These days, herbal formulations are highly sought after due to their effectiveness in avoiding adverse effects when compared to synthetic formulations. It can be made from both synthetic and herbal substances Tooth powder and paste are placed to the teeth and rubbed against them, using their abrasive qualities to help remove the minerals and food debris that have built up there. In order to maintain oral hygiene, including breath freshness and tooth decay prevention, tooth powder is used in conjunction with a toothbrush. The goal of this effort was to create a tooth powder that could be used as a tool for good oral hygiene and to combat the negative effects of the traditional tooth powder made from synthetic substances. The teeth powder was created utilising a variety of herbal components that have cooling, antibacterial, and antiseptic qualities. baking soda, pink food colouring, cinnamon, clove, neem, and amla powder The Himalayan herbs were utilised in this effort to create the perfect tooth powder, which can satisfy all the necessary requirements to keep the mouth fresh and to prevent tooth decay. Based on its abrasive qualities, tooth powder helps to remove food debris and minerals that have been deposited on the teeth after being applied to them. It can help with disguising and eliminating. Herbal toothpowder contains a lot of calcium, trace minerals, and antibacterial herbs. Baking soda changes the pH of the mouth, which lowers the number of germs that causes cavities. The calcium and trace minerals help to restore dental enamel, while the herbs have antibacterial properties and encourage gum blood flow. For its superior quality and longer shelf life, herbal tooth powder is well regarded. A tooth-cleaning agent comprised almost entirely of natural components is herbal tooth powder.

**1.1 Perfect Qualities**

Good abrasive effects, non-toxic, non-irritating effects that last a long time, keeping the mouth fresh and clean, no teeth stains, and affordability and accessibility.

**1.2 Toothpowder Types**

1. Tooth whitening paste
2. Organic toothpaste
3. Natural toothpaste
4. Homemade dental powder

**• Tooth whitening powder**

Its goals include reducing mouth irritation, healing gums, and improving breath. A person's teeth can be polished and made whiter with tooth powder.

- **Organic Toothpowder**

Natural tooth powder frequently contains elements like sea salt, which is an abrasive, natural substances, and some essential oils like peppermint, eucalyptus, and wintergreen.

- **Natural toothpaste**

Herbal tooth powder is also beneficial for sore or bleeding gums. Ingredients in herbal tooth powder can vary. White clay, powdered chalk, and baking soda are all prevalent. natural toothpaste

- **Natural Toothpowder**

These powders can be produced at home as well. Homemade herbal tooth powder can be advantageous because it may be less expensive and the maker will know exactly what components he is putting in his mouth, his children's mouths, and their mouths.

### 1.3 Benefit of Natural Toothpowder:

It's important to note that utilising tooth powder regularly has a number of benefits. Not only did your teeth need additional care for a beautiful smile, but also for your general health. Because gum disease and cavities are not the only consequences of inadequate oral hygiene. But it can also raise the chance of developing more severe problems including heart disease and Alzheimer's disease.

### 1.4 DISADVANTAGE OF TOOTH POWDER

1. If the environment is damp and conducive to deterioration, the substance is bitter.
2. could be too harsh for teeth
3. clumsy or challenging to utilise
4. could leave behind a bad aftertaste

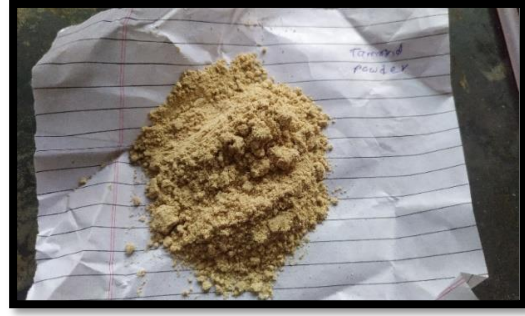
### 1.5 ADVANTAGE OF TOOTH POWDER

Importantly, there are numerous advantages to using tooth powder daily. Your teeth needed more attention not only for a beautiful smile but also for your overall health. Because poor dental health will not only lead to cavities and gum infection. But it can increase the risk of more serious conditions like heart disease and Alzheimer's diseases



## Role of ingredients

### 1.Tamarind seed powder



- **Family:** Fabaceae
- **Order:** Fables
- **Genus:** Tamarindus
- **Species:** T. Indica.
- **Uses:** Dental preparation uses tamarind seed powder for smokers who smoke a lot, applying tamarind seed powder to their gums and teeth is thought to provide health benefits.

### 2.Clove:



- **Synonym:** caryophyllum, clove buds, lavang
- **Family:** Myrtaceous
- **Common name:** clove,
- **Parts used:** dried flowers buds
- **Plant Taxonomy**
  - **Kingdom:** plantae
  - **Order:** Myrtales
  - **Genus:** syzygium
  - **Species:** saromaticum
- **Distribution:** Clove is also grown in Malaysia, Sri Lanka, Haiti, India, Indonesia, France, and the United States. Description Evergreen clove trees may reach a height of around 40 feet. They have smooth bark similar to bay leaves.(3,6)

- **Cinnamon:**



- **Synonym:** Cinnamon bark
- **Family:** lauraceae
- **Common name:** Cinnamon verum
- **Part used:** dried inner bark of the shoots of trees of *Cinnamomum selenium*
- **Sanskrit:** cassia, Chinese cinnamon<sup>(7)</sup>

### 3.Sodium Bicarbonate



Bicarbonate of sodium baking soda, commonly known as sodium bicarbonate, works by neutralizing excess stomach acid to treat heartburn, sour stomach, and acid indigestion. In the food and beverage business, sodium bicarbonate is primarily utilized in the production of a wide variety of culinary products, including cakes, muffins, cookies, soda bread, breads, and sports drinks. Many various dentifrice formulations are renowned for leaving the mouth feeling clean and fresh. By neutralizing acidic doors, sodium bicarbonate also aids in deodorizing the mouth cavity.

- **Properties:**

Its characteristics include not being combustible and not being as explosive as powder dust

- It has a simple nature.
- **Uses:**
- Baking products are made with banking soda.
- Mild cleaning agent
- Used as an antacid in medicine to alleviate excess stomach acid

- Prepare soda water or other aerated water.

**-Molecular weight** -84.006g/moll

**Sources:** Baking soda or sodium Bicarbonate comes from soda ash obtained either through the Solvay process or form from an ore, a hard, crystalline material.

Pharmaceutical Uses

Is used to relieve heartburn, sour stomach or acid indigestion by neutralizing excess stomach acid. It may be used to treat the symptoms of stomach or duodenal ulcers

- Sodium bicarbonate reduces stomach acid.

#### 4.. Tulsi



**Synonyms:** *Sacred basil, Kali-Tulsi, Veranda*

**Family:** *lamiaceae*

**Genus:** *ocimum*

**Biological source:** Tulsi consists of the fresh and dried leaves of *Ocimum* species like *Ocimum sanctum* L. and *Ocimum basilicum* L. etc.

**Uses:**

- Expectorant, bronchitis.
- Stomachic
- Carminative.
- Stimulant
- Flavouring agent

#### 5.Camphor



- **Synonyms:** Gum Camphor, Japan Camphor.



- **Biological Source:** Camphor is a solid ketone, obtained from the volatile oil of *Cinnamomum camphora* (L.) Nees et Eber, belonging to family Lauraceae. Synthetic camphor, which is optically inactive, is prepared from turpentine and would probably have completely replaced the natural product.

- **Geographical Source**

The plant is a big tree native to Eastern Asia, it is found widely in Mediterranean region, Sri Lanka, Egypt, South Africa, Java, Sumatra, Brazil, Jamaica, Florida, Formosa, Japan, South China, India, and California. In India, the tree is planted in gardens up to 1,300 m height in the North-west Himalayas. It is successfully cultivated at Dehradun, Saharanpur, Calcutta, Nilgiris, and Mysore.

- **Uses**

- Camphor is used externally as a rubefacient, counterirritant and internally as a stimulant, carminative and antiseptic. It is a topical antipruritic and anti-infective, used as 1–3% in skin medicaments and in cosmetic.
- It is also used to manufacture some plastics, celluloid, in lacquers, var-nishes, explosives, pyrotechnics, as moth repellent, and in embalming fluids.<sup>(5,12)</sup>

## Rock salt



- **Category:** Halide Mineral
- **Formula (repeating unit):** NaCl
- **Use:**
  - Whitening toothpaste with rock salt. Removes stains for whiter teeth. Rock salt is the healthiest form of salt in Ayurveda.
  - The salt works as a gentle abrasive, helping to remove stains from the teeth<sup>(8)</sup>

## . Black jeera (carum carvi)



- **Botanical name:** carum carvi
- **Kingdom:** plantae
- **Division:** tracheophyte
- **Order:** Apiaceae
- **Genus:** Carum
- **Family:** Umbelliferae
- **Uses:**
  - It is use for the dental preparation.
  - It is using as uterine disinfectant.
  - It is use as appetizer stimulant

## Pepper



- **Kingdom:** plantae
- **Clade:** Tracheophytes
- **Order:** Piperales
- **Species:** P. nigrum
- **Family:** Piperaceae
- **Genus:** Piper
- **Binomial name:** Pepper Nigrum.<sup>(14)</sup>



## 10. Activated charcoal



- **Botanical Name:** Carbo vegetabilis ex Ligno
- **Family:** various
- **Place Of Origin:** Asia
- **Smell:** Indore<sup>(15)</sup>
- **Use:**
  - Activated charcoal is the pure form of food grade charcoal which helps in pulling the stains off your teeth. It is a safe and excellent alternative to the teeth whitening products which contains harmful synthetic chemicals with artificial colors and flavors.
  - Activated charcoal is used in the emergency treatment of certain kinds of poisoning. It helps prevent the poison from being absorbed from the stomach into the body.

## Peppermint



- **Family:** Lamiaceae
- **Genus:** Mentha
- **Species:** M. × piperita
- **Kingdom:** Plantae
- **Biological source:** peppermint oil is essential oil taken from the flowering parts and leaves of the peppermint plant.
- **Use:**
  - Peppermint is a common flavoring agent in foods and beverages, and peppermint oil is used as a fragrance in soaps and cosmetics.
  - Peppermint has been used for health purposes for several thousand years. Records from ancient Greece, Rome, and Egypt mention that it was used for digestive disorders and other conditions<sup>(9)</sup>

## Evaluation

- Color: The prepared tooth powder's color was assessed. The color was visually examined.
- Smell the product to detect any odor.
- Taste: The product's taste was manually assessed by tasting it.
- Stability: To test the product's stability, it was kept at various temperatures.
- Spread ability: The powder's spread ability was assessed manually.
- Abrasiveness: It was manually assessed.
- **pH of Herbal tooth powder:**



- Foamability: The product's foamability was assessed by adding a tiny amount of preparation to water in a measuring cylinder, noting the initial volume, and then shaking the cylinder ten times. Foam's last volume was recorded.
- Bulk Density: The weight of a volume unit of powder, which is commonly expressed in  $\text{g/cm}^3$ ,  $\text{kg/m}^3$ , or  $\text{g}/100$  ml. The volume of a suitable gramme of powder in a 250 ml graduated cylinder is commonly measured to determine the bulk density after it has been subjected to compaction by standardized tapping.

### Tapped Dencity:

The phrase "tapped density" describes the increased bulk density that happens when a container containing a sample of powder is mechanically tapped. After the initial observation of the powder volume or mass, the measuring cylinder or vessel is mechanically tapped for one minute, and volume or mass readings are taken until there is little more volume or mass change detected. The measurement unit was grammes per cubic centimeters.

Determine the crucible's weight and record it to four decimal places.

About 2 g of weight should be added to the crucible.

Record the weight with a four-point precision.

**Discussion:** The formulation and evaluation of herbal tooth powder was done in this study. The organoleptic characteristic had a sweet-tasting aroma and a greenish colour. The bulk density of the powder is  $4 \text{ gm/ml}$ . The flow property was discovered using the angle of repose, and it demonstrates good flow property. The

formulation's pH was determined to be 7.15. The most prevalent oral infectious disease in children and the elderly is dental caries. The oral cavity must be cleared of cancer-causing germs, their plaque must not form, and tooth resistance to demineralization must be improved as part of the prevention approach against dental caries.

#### CONCLUSION:

The chemicals utilised in the current experiment were examined and chosen for their ability to maintain oral hygiene and have an antibacterial impact, which may be attributed to the formulation of effective toothpastes. Any herbal toothpaste is thought to be safe to use twice daily and has no negative side effects. Instead, it imparts good freshness and keeps undesirable odours at bay. Using herbal tooth powder is a dependable, safe, and affordable option to maintain oral hygiene.

The study found that natural tooth powders are less likely to cause negative effects than synthetic preparations, are more prominent in dental research, and are safer overall. The specially prepared tooth powder can maintain oral and dental health while also exhibiting anti-microbial activity against infections. The herbal tooth was created

#### Future Aims:

The developed herbal tooth powder has a bright future in the study of herbal therapies and public oral health. The market value of herbal toothpaste and other items is rising daily.

According to market research and environmental considerations, formulations increase in value on the market.

Using herbal tooth powder will help you maintain healthy, strong teeth. The majority of herbal substances have positive benefits and help to lessen dental issues.

The advantages of components' all-natural, multipurpose qualities are driving up demand for them.

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