



## FORMULATION AND EVALUATION OF HERBAL TOOTH POWDER

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### ABSTRACT

Dentifrices are products that are primarily used to maintain oral hygiene, including breath freshness and tooth decay prevention. Throughout the day, oral hygiene can be kept up by using a variety of dentifrices made from both herbal and artificial substances. This research was done to create a tooth powder that can be used to maintain good oral hygiene and to combat the negative effects of the synthetic components used to create traditional tooth powder. Several natural substances with antibacterial and antiseptic qualities were used to make the tooth powder. Myrobalan neem, amla, clove, cinnamon are the herbal ingredients which created the perfect tooth powder that can satisfy all the necessary requirements to keep the mouth fresh and to prevent tooth decay caused by germs. To make sure the created tooth powder has all the necessary qualities to be used against dental problems, it was tested for its organoleptic and physical characteristics, including colour, odour, taste, stability, foamability, and abrasiveness. The outcome was determined to be within the legal bounds.

**KEYWORDS:** Oral Hygiene, Herbal ingredients & Anti-bacterial effect.

### INTRODUCTION

According to WHO estimates, 80% of the world's population, especially those in impoverished countries, gets their medical treatment from plants, and interest in traditional medicine is rising globally.<sup>[1]</sup> Natural products are safe, reasonably priced, and effective replacements for the current generation of chemotherapy drugs, which have unfavorable side effects and elevated bacterial resistance. India, a nation well-known for its traditional medical practices, has long been interested in the hunt for complementary and alternative therapies, particularly those involving natural products.<sup>[2]</sup> Oral hygiene has a major role in maintaining one's attractive look, self-esteem, and confidence. The two fundamental parts of a tooth are the crown and the root. The tooth's exterior surface is covered in enamel, which is the toughest tissue in the tooth. Enamel's primary constituents, other from hydroxylapatite, are keratin and water. Beneath the enamel is a layer of hydroxylapatite called dentine.<sup>[3]</sup> Plus, seventy percent of the water in the collagen is there. Fluorine is the main component of dentine. Additionally, saliva is present in the mouth, which facilitates food swallowing. Saliva is the major ingredient utilized to keep the mouth in an optimum state and lubricate foods. The bigger and smaller salivary glands—the lingual, labial, buccal, and palatal—are responsible for producing saliva continually to maintain a dynamic environment surrounding the teeth. Inorganic materials found in saliva include bacteria, enzymes,

proteins, sodium, phosphate, potassium ions, calcium, chloride, and mucin polysaccharide.<sup>[4]</sup> Calculus, plaque, and periodontal diseases are the three main dental issues. The mineralized deposition that results in calculus is mostly caused by bacterial activity. Since these ailments are mostly caused by inadequate dental care, they may be treated and prevented by brushing correctly and using efficient toothpastes and tooth powders.<sup>[5]</sup> Dental plaque is a sticky substance that can harbor germs and covers teeth. If dental plaque is not removed while it is still soft, it hardens and becomes difficult to remove. Tooth decay or loss may arise from dental plaque-induced tooth damage. Not only may periodontitis cause damage to the gums and bones, but it can also destroy the jawbone. Periodontitis is common, however it is mainly preventable. Typically, poor oral hygiene is the cause. Periodontitis can lead to tooth loss.<sup>[7]</sup> Dentifrice is a preventative cosmetic therapy for teeth that may be used to control and prevent tooth decay and bad breath. It is possible to make dentifrice using both synthetic and natural ingredients. Herbal formulations are becoming more and more in demand since they are more effective at reducing negative effects than formulations made of synthetic chemicals. Tooth powders and pastes are used on teeth and rub against them according to their abrasive properties, them, aiding in the removal of food particles and minerals that have accumulated there.<sup>[10,11]</sup> There are several different versions of the herbal dentifrices available, such as toothpaste, mouthwash, and tooth

powder. Toothpaste and powder are useful in eliminating plaque because they include compounds that feel cold and fresh and have antibacterial and antiseptic qualities.<sup>[12]</sup> This work aimed to counteract the drawbacks of traditional tooth powder composed of synthetic materials and create a tooth powder that may be utilized as a permanent oral hygiene tool. The bactericide, antiseptic, and cooling qualities of the substances were used to victimize them and create the tooth powder. Powdered myrobalan Some of the components used in this work to create the ideal tooth powder that may fulfill all the stated features to keep the mouth clean and avoid carries are amla powder, clove powder, cinnamon powder, and neem powder.<sup>[13]</sup> The present investigation employed organoleptic, physicochemical, physical, and phytochemical characteristics to examine a herbal dentifrice. Tooth powder improves breath freshness and tooth whitening.<sup>[14]</sup> Herbal toothpowder is rich in antimicrobial herbs, trace minerals, and calcium. By altering the mouth's pH, baking soda reduces the number of bacteria that cause cavities. The herbs offer antimicrobial qualities and promote gum blood flow, while the calcium and trace minerals aid in the restoration of tooth enamel. Herbal tooth powder is well known for its higher quality and longer shelf life. Herbal tooth powder is a teeth-cleaning solution made almost entirely of natural ingredients.<sup>[15]</sup>

## CURRENT SITUATION OF TOOTH POWDER

According to IRS statistics (those who use neither toothpaste nor toothpowder), 66 percent of Indian households currently use toothpaste, 24 percent use toothpowder, and 18 percent don't use any toothpaste at all."These numbers aren't particularly impressive in and of themselves because the Republic of Asia generally uses tooth powder and cleaners." However, some people use both dentifrice and tooth powder because they believe that applying tooth powder to the gums is the greatest way to practice good oral hygiene. Toothpowders are currently in style with consumers all over the world. There are several examples of foreign companies bringing toothpowder to their domestic markets these days. But the demand for toothpaste is far more than that for toothpowder. Still, some customers—especially the elderly—are completely obsessed with tooth powders.<sup>[16,17]</sup>

### 1. Ingredients in dentifrices

Most of the dentifrice contains the following ingredients.

#### Abrasive

They are included to polish teeth and get rid of stains. Combining the abrasive action of one with the cleansing activity of the other yields the greatest results. The kind and quantity of abrasive particles, the surface the abrasive comes into contact with, dilution with saliva, and brush pressure all affect how deterrent an abrasive is. Alumina hydrate, calcium carbonate, brushite, gibbsite,

and silica/silicate hydrate are examples of commonly used abrasives.<sup>[18]</sup>

#### Humectants

They hydrate the toothpaste and keep it from drying out while it's being stored. It contributes to the toothpaste's creamy, silky feel. Humectants include things like paraffin oil, sorbitol, glycerine, and propylene glycol.<sup>[18,19]</sup>

#### Surfactant/Detergent

In order to remove dirt, they emulsify with a foaming action, serve as surfactants, and lower surface tension. Some of the frequently used detergents added to toothpaste include sodium lauryl sulfate, sodium lauryl sarcoside, sodium monoglyceride sulfate, ethionates of fatty acids, sodium dodecylbenzene sulfonate, and PEG oil (polyethylene glycol oil).<sup>[18,19]</sup>

#### Binding agents/Thickening agents

By preventing the separation of the solid and liquid phases, these hydrophilic colloids—which scatter or swell in the presence of water—are employed to stabilize dentifrice compositions. Examples include Xanthan gum, Carbomer-940 A or Carbomer-956, Seaweed Colloid (Alginate, Irish Moss Extract, Carrageenan Gum), Natural Gum (Arabic Gum, Arecalaya Gum, Tragacanth Gum), and Synthetic Cellulose (Carboxymethylcellulose, Hydroxyethylcellulose).<sup>[19]</sup>

#### Flavouring agents

Without any additional flavorings, toothpaste tastes rather awful. As a result, a variety of artificial and natural flavors, including peppermint, wintergreen, spearmint, and saccharin, as well as sweeteners like xylitol, acesulfame K, and aspartame, are added. Indeed, it has. A sweet flavor is also provided by moisturizer sorbitol. However, toothpaste containing sugar or other compounds known to cause tooth decay is not eligible for the seal of approval from the American Dental Association (ADA).<sup>[18]</sup>

#### Therapeutic agents

Fluoride, triclosan, sanguinarine, and chlorhexidine are active compounds that are added to toothpaste in order to minimize tooth decay, regulate tartar build-up, help with desensitization, and give antibacterial and anti-inflammatory properties.<sup>[19]</sup>

#### Colouring agents

The toothpaste's appealing tint is attributed to colorant. Pastels in the colors red, green, and blue are made with FD&C Blue No. 1. Certain toothpastes are whitening agents that contain titanium dioxide, which isn't in gel toothpastes.<sup>[18]</sup>

#### Preservatives

Because preservatives stop microorganisms from growing in toothpaste, there's no need to keep toothpaste

refrigerated. Sodium benzoate, methylparaben, and ethylparaben are examples of common preservatives.<sup>[18]</sup>

### Water

It dissolves the components and serves as a solvent. You can combine them.

### Types of Oral and Dental disease

It's not unexpected that so many things break down over time, especially if you don't take good care of your teeth because we tend to utilize our jaws and teeth for a variety of other purposes. Most dental and oral health problems may be avoided with good mouth hygiene.

### Cavities

Cavities are also known as dental decay, or caries. These are areas of the teeth that have been damaged over time and may possibly develop cavities. Cavities are quite common. They develop on your teeth when bacteria, acid, and food come together to form a plaque. Because of the acid on them, the enamel on your teeth begins to disintegrate, revealing the dentin or connective tissue underneath. There could eventually be irreversible damage from this.<sup>[20,21]</sup>

### Gum Disease

Gum inflammation is also known as gingivitis, another name for gum disease. It usually occurs when poor brushing and flossing habits cause plaque to build up on your teeth. Gum bleeding might worsen with gingivitis when you brush or floss. If gingivitis is not treated, it can progress to periodontitis, an infection that is more dangerous.<sup>[22]</sup>

### Periodontitis

The worsening of periodontitis can lead to an infection in your jaw and bones. It may also trigger an inflammatory reaction throughout the body.<sup>[23]</sup>

### Cracked/Broken teeth

A tooth might shatter or crack as a result of eating hard meals, grinding your teeth all night, or receiving a mouth injury. A fractured tooth might be quite painful. If you have a fractured or cracked tooth, it's critical that you see a dentist as soon as possible.<sup>[24]</sup>

### Sensitive Teeth

Consuming or drinking anything hot or cold might hurt your teeth if you have sensitive teeth. Dentin hypersensitivity is another term for tooth sensitivity. Usually, it occurs quickly as a filling or channel opens. It might perhaps originate from:

Receding gums

- Cracked tooth
- Gum disease
- Worn-down fillings or crowns

Because their enamel is weakening, some people have sensitive teeth by nature. You may treat your naturally sensitive teeth by making an adjustment to your daily

oral hygiene regimen. There are toothpaste and mouthwash products designed specifically for those with sensitive teeth.<sup>[25]</sup>

### Oral Cancer

Its embrace cancer of gums, tongue, lips, cheek, lips, floor of the mouth.

Chewing tobacco and smoking are the main causes of oral cancer.<sup>[26]</sup>

- Gums
- Tongue
- Lips
- Cheek
- Floor of the mouth

The leading causes of mouth cancer are smoking and chewing tobacco.<sup>[26]</sup>

### Ideal Properties of Tooth Powder

#### • Good abrasive effect

Silica, calcium carbonate, baking soda, aluminium oxide are mostly used as abrasive. They are important because they help in removing stains and debris from teeth.

#### • Non irritant and non toxic

Tooth powder while using should not be irritant to teeth. It should also not contain any toxic substance which would harm teeth. As dentifrices contain many chemicals which carry functions like maintain dental health and cleaning teeth. Chemicals such as triclosan may cause cancer, sodium lauryl sulphate is used as foaming agent but act as skin irritant and dry off the delicate skin which seeps into blood. Propylene glycol, fluoride, Diethanolamine (DEA) should also be avoided in dentifrices as are harmful.

#### • Prolonged effect

Tooth powder should have long lasting effect to keep excellent dental health for long time.

#### • Impart no stain in tooth

Carbamide peroxide, hydrogen peroxide are whitening agents used in dentifrice. Baking soda, charcoal, vinegar are natural ingredients used in dentifrice. Natural ingredients whereas take more time to offer good result. Thus these stain removers helps to whiten and polish teeth. Thus they help removing discolouration of tooth.

#### • Cheap and easily available

Tooth powder must contain the ingredients which are cost efficient and are easily available in market. There shouldn't be shortage of any material.

#### • Keep the mouth fresh and clean

Tooth powder must have flavouring agent which helps to maintain good odour of mouth. Peppermint, spearmint oil, saccharin, xylitol are added for fresh breath and mask bitter taste over other ingredients.<sup>[27]</sup>

## Types of Toothpowder

### 1. Tooth powder

Its goal is to improve breath quality, mend gums, and reduce oral inflammation. A person's teeth can be polished and made whiter with tooth powder.<sup>[28]</sup>

### 2. Natural tooth powder

Natural tooth powder frequently contains components like sea salt, which has an abrasive effect, natural chalk, and some essential oils including peppermint, eucalyptus, and wintergreen.<sup>[29]</sup>

### 3. Herbal tooth powder

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. Since ancient times, there has been herbal tooth powder.<sup>[30]</sup>

### 4. Homemade tooth powder

These powders can be produced at home as well. Because it is less expensive, the person producing it will know precisely what components he is putting in his mouth, and it is safe for kids, homemade herbal tooth powder can be advantageous.<sup>[31]</sup>

### Advantages of Herbal Toothpowder

- Maintain oral hygiene.
- Fight against bad breath.
- Prevents plaque formation.
- Cures tooth sensitivity and toothache.
- Relieves painful, bleeddy and spongy gums in gingivitis.

- Easy to use.

### Disadvantages of Toothpowder

- Lacks the cavity-fighting component fluoride.
- Leaves a bad aftertaste in your mouth
- Too much abrasiveness can be bad for your tongue.
- The ADA has not given any powders its seal of approval.<sup>[32]</sup>

### Need to Prepare Herbal Toothpowder

- The primary goal of this invention is to create a formulation that may be used to replace the disadvantages of earlier tooth powders with a natural herbal tooth powder.
- Another goal is to create a high-quality tooth powder that, when applied frequently, can effectively shield teeth against toxicity, poisonous residue, and inflammation. It should not leave stains on teeth or fingers after use, have a nice odour, and meet cosmetic standards. A requirement of the formulation would be to whiten teeth by removing stains.
- A formulation with natural aromatic and medicinal herbs that are safe, biodegradable, and have very low mammalian toxicity is yet another goal of the current innovation. These herbs are helpful for gums and teeth.<sup>[33]</sup>

## COMMERCIAL TOOTHPOWDERS AVAILABLE IN MARKET

Table 3.1: Marketed Preparation of Herbal Toothpowder.

BRAND NAME	INGREDIEN TS	USES	FIGURE
<b>Dabur LalDant Manjan</b>	<ul style="list-style-type: none"> <li>• Clove Oil</li> <li>• Pudina</li> <li>• Satva &amp; Karpura</li> <li>• Pippai</li> <li>• Tomar Beej</li> </ul>	<ul style="list-style-type: none"> <li>• Effective</li> <li>• Against</li> <li>• Bacteria and Beneficial For Gingivitis.</li> <li>• Helps Prevent Foul Breath and Toothaches.</li> </ul>	
<b>VithobaDant Manjan</b>	<ul style="list-style-type: none"> <li>• Laung</li> <li>• Lahore</li> <li>• Namak</li> </ul>	<ul style="list-style-type: none"> <li>• Prevents Tooth Decay.</li> <li>• Effective</li> <li>• Against</li> <li>• Strong Teeth and Healthy Gums.</li> <li>• Relieve</li> <li>• Toothaches</li> <li>• Eliminates</li> <li>• Worms and Shield Teeth From Being Harmed By</li> <li>• Cold Foods.</li> </ul>	

<b>Divya Dant Manjan</b>	<ul style="list-style-type: none"> <li>• Babool</li> <li>• Neem</li> <li>• Tumberu</li> <li>• Pudina</li> <li>• Majufal</li> <li>• Haldi</li> <li>• Samudra Fen</li> </ul>	<ul style="list-style-type: none"> <li>• Results In Strong Gums.</li> <li>• Dental</li> <li>• Problems</li> <li>• Like Pieria I.E</li> <li>• Flow of Excess Blood And Pus From Gums Would</li> <li>• Be Solved.</li> </ul>	
<b>Vicco Vajradanti Powder</b>	<ul style="list-style-type: none"> <li>• Ajwain</li> <li>• Dalchini</li> <li>• Khair</li> <li>• Patang</li> <li>• Harada</li> <li>• Amala</li> <li>• Behada</li> <li>• Maifal</li> <li>• Babbul</li> <li>• Jambhul</li> <li>• Acrod</li> </ul>	<ul style="list-style-type: none"> <li>• Treats</li> <li>• Pyrorrhoea,</li> <li>• Swollen</li> <li>• Gums, Bleeding Gums and Gum</li> <li>• Irritation</li> <li>• While Preventing Tooth Decay.</li> <li>• Used To Treat Toothaches.</li> <li>• Cure Wounds.</li> <li>• Harden Gums and Teeth.</li> </ul>	

### HERBS USED

1. Neem powder
2. Amla powder
3. Clove powder
4. Cinnamon powder
5. Peppermint

#### 1. Neem

The neem tree grows quickly. Although it is evergreen, in extreme droughts the majority of its leaves may fall off. Because it is a rich source of antioxidants and is used as an antibacterial agent and to freshen the breath, its fruit and seeds are the source of neem oil, which is credited with having a healthpromoting impact.<sup>[34]</sup>

- Synonym- *Melia azadirachta*
- Family- Meliaceae
- Common name- Neem
- Parts used-dried leaves
- Vernacular name- Sanskrit- Nimba, Arishta, Ravipriya, Hindi- Nimb,

#### Geographical Regions

The exact place of origin is unknown, while some people assert that neem is a native of the entire Indian subcontinent, while others attribute it to dry woods in Sri Lanka, Malaysia, and Indonesia. India is the country that uses the tree the most.<sup>[35]</sup>

#### How to prepare neem powder

1. Neem leaves were taken from local sources and dried for two to three days. The dried leaf was then crushed into fine particles using a tool for grinding.
2. At a temperature of roughly 400°C, the powder is activated. Following that, the powder was sieved using a 90 micron IS standard sieve size. Using filter paper, sieved particles are filtered before being rinsed with double distilled water.

3. The dried, cleaned powder is then prepared for use as a bio coagulant. To protect it from moisture, the fine powder was gathered and placed in an airtight container.<sup>[36]</sup>



Fig. 3.1: Neem & its Powder.

#### 2. Amla

Amla is frequently referred to as an Indian gooseberry. The berries of the trees are often used in pharmaceutical formulations due to their therapeutic properties. In classical Ayurveda, the Amla is described to by a number of titles, including sour, nurse, immortality, and mother.<sup>[37]</sup>

- Synonym- *phyllanthusemblica L.*
- Family- Euphorbiaceae
- Common name- Amla
- Parts used- pericarp of dried matured fruits
- Vernacular names- Sanskrit-Amalaka, Dhhatrtripala, English- Emblic myrobalan, Hindi- Amhala

#### Geographical Regions

Throughout India<sup>[38]</sup> How to prepare amla powder

1. Amla's should be chopped into small pieces and dried in the sun for a few days. The dried-up amla fragments will be visible after a few days in the sun.
2. Transfer the dried amla pieces into a blender and blend them completely.
3. The Amla powder is ready. The amla powder can be stored in an airtight container.<sup>[39]</sup>



Fig. 3.2: Amla & its Powder.

### 3. Clove

Clove trees are evergreens that grow to some 40 feet tall. Their bark is smooth and gray and their long, 5-inch leaves look like bay leaves.<sup>[40]</sup>

- Synonym- caryophyllum, clove buds, lavang
- Family-Myrtaceae
- Common name-clove, cengkih chengkeh
- Parts used- dried flower buds
- Vernacularname-Sanskrit-lavanga, varala, lavangam, English- lavang, laumg

### Geographical Regions

Clove is also grown in Malaysia, Sri Lanka, India, Indonesia, France, USA.<sup>[41]</sup> How to prepare clove powder

1. Bring a cast iron or other non-coated pan to medium high heat.
2. Place whole cloves into pan and toss for 2 minutes or until fragrant immediately remove from heat and let cool.
3. Move cloves to a spice mill, coffee grinder, or mortar and pestle. Grind until cloves are a fine power.<sup>[42]</sup>



Fig. 3.3: Clove & its powder.

### 4. Cinnamon

Cinnamon trees grow to a height of 10–15 metres (30–50 feet). The leaves are 7–18 cm long and ovate-oblong in form. The blooms, which grow in panicles, are greenish in colour and smell strongly. The fruit is a singleseeded purple lemming drupe.<sup>[43]</sup>

- Synonym- Cinnamon bark
- Family- Lauraceae
- Common name-Cinnamon verum
- Parts used-dried inner bark of the shoots of trees of cinnamomum zeylanicum • Vernacularnames-Sanskrit- Cassia, Chinese cinnamon, English- sthula

tvak, Taja.

### Geographical Regions

Cinnamon trees are 10-15 metres (30- 50 feet) tall. The leaves are ovate – oblong in shape and 7-18 cm long. The flowers which are arranged in panicles have a greenish colour and a distinct odour.<sup>[44]</sup>

### How to prepare cinnamon powder

1. Cinnamon sticks should be broken into smaller sticks (This helps the sticks to get powdered without much difficulty)
2. Using a food processor or blender, now finely powder it. Sieve the powdered cinnamon.



Fig 3.4 Cinnamon & its powder.

### 5. Peppermint

The hybrid species of mint known as peppermint is a cross between spearmint and water mint.<sup>[46]</sup>

- Synonym- Mentha piperita
- Family- Lamiaceae
- Common name- Eucalyptus amygdalina
- Parts used- leaf
- Vernacular names - English- peppermint, Hindi- Pudina

### Geographical Regions

The plant, which is originally from Europe and the Middle East, is now widely farmed throughout the world. It occasionally coexists with its parent species in the wild.<sup>[47]</sup>

### How to prepare peppermint oil

1. Put fresh peppermint leaves in a glass jar with a tight lid and crush or muddle them.
2. Apply grapeseed or olive oil to the leaves. Lock the jar lid and shake.
3. Keep for three days. Put the leaves in a basin after straining.
4. Pack the jar with fresh leaves, pour the oil back in the jar and cover with fresh oil.<sup>[48]</sup>



Fig. 3.5: Peppermint.

## 6. Excipient Profile

- A) Sodium bicarbonate  
B) Himalaya Pink Salt

### A) Sodium Bicarbonate

Baking soda, commonly known as sodium bicarbonate, works by neutralising excess stomach acid to treat heartburn, sour stomach, and acid indigestion. The cleaning, whitening, and preservation of teeth are known benefits of numerous different dentifrice formulations. The mouth feels clean and fresh after consuming sodium bicarbonate. Additionally, sodium bicarbonate aids in deodorising the mouth by neutralising acidic odours.<sup>[49]</sup>

Sources- Baking soda or sodium Bicarbonate comes from soda ash obtained either through the Solvay process or form from anore, ahard, crystalline material.

### Use of Sodium Bicarbonate in Oral Hygiene

Baking soda is used for tooth whitening as when it comes in touch with water, it forms an alkaline solution which thus release free radicals that help in teeth whitening. Apart from these it is also used to prevent tooth decay, cavity formation and gum disease.<sup>[50]</sup>

## Ingredients Quantity & Their Roles

SR. NO	INGREDIENTS	QUANTITY	ROLE OF INGREDINTS
1.	Neem Powder	10 gm	Antiseptic
2.	Amla Powder	2 gm	Antibacterial
3.	Clove Powder	3 gm	Antioxidant
4.	Cinnamon Powder	10 gm	Germicide
5.	Peppermint oil	Q.S	Prevents bad breath
6.	Baking soda	2 gm	Abrasive
7.	Himalaya Pink salt	3 gm	Flavouring agent Preservative

## PROCEDURE FOR PREPARATION OF HERBAL TOOTH POWDER

1. Take 1 tablespoon of Amla powder, Neem Powder, Cinnamon powder, Baking soda, Pink himalaya salt mix it well.

2. Add few drops of papermint or tea tree oil or clove essential oil(Optional) Add few drops of papermint or tea tree oil or clove essential oil(Optional) Add few drops of papermint or tea tree oil or clove essential oil(Optional)

3. Add 1 tablespoon mint leaf powder or pudina. Mix well all powder & Store in well closed container.



Fig 3.6 Sodium Bicarbonate

### B) Himalaya Pink Salt

Comparable to table salt chemically is pink Himalayan salt. It has a sodium chloride content of up to 98%. The remaining salt is made up of trace minerals like potassium, magnesium, and calcium. Halite, or rock salt, is mined in Pakistan's Punjab province to produce Himalayan salt.

### Use of Himalaya Pink Salt in Oral Hygiene

Helps in preventing the build-up of plaque and tartar. Also fight halitosis, Also used as flavouring and sweetening agent.<sup>[51]</sup>



Fig 3.7 Himalaya Pink Salt

## PARAMETERS TO BE EVALUATED

### Physical Examination

- COLOUR- The colour of toothpowder was checked visually.
- ODOUR - Odour would be found by smelling the product.
- TASTE- Taste will be checked manually by tasting the product.
- ABRASIVENESS- They make up the tooth polishing particles. Each of these powders is designed to remove material, with some powders being more aggressive than others. The "grit" of the

powder is typically referred to as the abrasiveness of the particles. It would be evaluated manually.

- **SPREADABILITY**- Spreadability would be evaluated by spreading the powder manually. It is thus calculated by placing the powder between two slides and measuring the length which is spread between them.
- **ABRASIVENESS**- They make up the tooth polishing particles. Each of these powders is designed to remove material, with some powders being more aggressive than others. The "grit" of the powder is typically referred to as the abrasiveness of the particles. It would be evaluated manually.<sup>[53]</sup>
- **FOAMABILITY**-Some amount of drug should be taken in a flask containing boiling water. It should be cooled and filtered in volumetric flask and volume was make-up. The decoction should be poured in test tubes and the volume of test-tube should be made up with water.<sup>[54]</sup>
- **DETERMINATION OF FLOW PROPERTY** -The angle of repose is calculated using the formula below.
- **Tan  $\theta = h/r$** <sup>[55]</sup>
- **DETERMINATION OF BULK DENSITY**- The volume of powder and the bulk density in gm/ml is calculated as **BULK DENSITY=WT. OF DRUG / TAPPED VOL.**<sup>[56]</sup>
- **DETERMINATION OF TAPPED DENSITY**- The formula to calculate tapped density is –
- **TAPPED DENSITY = WT.OF DRUG/TAPPED VOLUME.**<sup>[57,59]</sup>
- **DETERMINATION OF SWELLING INDEX**- The formula to calculate swelling index is-**S.I=FINAL VOLUME-INITIAL VOLUME**
- **S.F=SWELLING INDEX X 100/ INITIAL VOLUME.**<sup>[58,59]</sup>

## RESULT AND DISCUSSION

S.R NO	PARAMETER	OBSERVATION
1	Colour	Brick red
2	Odour	Characteristics Pungent
3	Taste	Astringent then sweet
4	Stability	Stable
5	Foamability	Good
6	P.H	7.2
7	Flow property	Poor

## CONCLUSION

The ingredients employed in this study were examined and chosen because they had antibacterial properties and helped maintain oral hygiene, which led to the conclusion that will make an effective toothpowder. Any herbal toothpowder is thought to be safe to use twice daily and has no negative side effects. Instead, it imparts good freshness and keeps bad odours at bay. Using herbal tooth powder is a dependable, safe, and affordable option to maintain oral hygiene. The study found that natural tooth powder is safer with fewer adverse effects

than synthetic preparation, and it is more accepted in dentistry research. The specially prepared tooth powder can maintain oral and dental health while also exhibiting antimicrobial activity against infections. The herbal tooth powder which will be created offers potential for the general population in the future. The toothpowder is used to fight against multipurpose like cavities, bacteria, discolouration of teeth, plaque, tartar, gingivitis, bad odour.

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