



"Formulation and Efficiency Testing of Herbal Tooth Powder "

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INTRODUCTION

Oral hygiene is an important part of maintaining good appearance, self-confidence and self- esteem. Herbal tooth powder is produced from various ingredients and there are many products on the market. Therefore, modern methods focusing on these properties are useful in modeling herbal medicines and their formulations. Consumers believe that the use of herbs, such as toothpowder, to treat diseases is safe, effective and non-toxic. Toothpowder supports oral hygiene, acts as a brush and helps remove plaque and food from the teeth and also helps prevent gingivitis, cavities and dental staining on the teeth and gums. The market price of herbal products is increasing day by day. Due to the differences in herbal ingredients, changes and the presence of harmful substances in the medicine, this medicine must be made of high quality and pure. There are many types of toothpowder on the market with different ingredients. Some pharmacopoeia monographs on plant materials do not include the identification and quantification of active substances. Therefore, modern methods focusing on these factors are useful in modeling herbal medicines and their formulations.

The tooth consists of two parts: crown and root. The crown is covered with the outer layer called enamel, which is the hardest tissue of the tooth. The main component of enamel is hydroxyapatite, as well as water and keratin. The oral cavity contains not only teeth but also saliva, which supports nutrition. Saliva is the main element that lubricates food and maintains a good oral environment. Saliva is produced by various glands such as the lips, tongue, chin and chin.

These diseases are often caused by neglect of good dental care, so they can be prevented and controlled by proper brushing, using good toothpowder and mouthwash. Toothbrush powder can be used to protect teeth from tooth decay and bad breath. Tooth powder can be prepared from synthetic ingredients and plants. Toothpowder and Toothpowders are used to brush teeth according to their abrasive properties, which will help more than synthetic models. Toothpowder and Toothpowders are used on teeth due to their abrasive properties, and rubbing with teeth helps remove food particles and

food debris from teeth. Oral health is important for physical health and quality of life.

Herbal tooth powder has been used for centuries and is considered by many to be an important part of dental care. Natural products have recently been increasingly investigated as promising agents for the prevention of oral diseases, especially plaque-related diseases such as Dental, due to the side effects of the use of toothpowder all toothpowder. There are some dangerous drugs that are of particular concern to children.

Ideal Properties :

- Good grinding results.
- Non-irritating, non-poisonous.
- Does not leave bacteria on the teeth.
- Keeps the mouth clean, fresh and clean.
- Long-lasting effect.
- Cheap and easy

LITERATURE SURVEY:

Yogita A. Ladgaonkar

Herbal tooth powder consisting of various ingredients that are available in the market in a wide range. Hence modern methods focusing on these aspects are useful for the standardization of herbs and their formulations. Consumers believed by using herbal-based toothpowder are safe, effective and less toxic. This study is thus aimed to provide an alternative to the consumer and formulate herbal toothpowder using Rosemary Leaf, Guava Leaf, Babul, Stevia Leaf, Black salt, Clove, Camphor, Alum, Triphala, Pudina, Ritha Fennel, Black Pepper, Tulasi, Madhunashini. The oral cavity infections are the most common types of infections. Dental caries is an infectious disease, causes damage and infection of enamel and dentine. If it is not treated, the infection continues and will lead to tooth loss. Therefore, in the present work, the following aspects of Herbal tooth powders were planned for the formulation, standardization, of herbal tooth powder and anti-bacterial screening of the extracts of herbal toothpowder.

Sachin B. Dudhe

Herbal tooth powder has been about for centuries and many believe it to be an essential part of any teeth cleaning regimen . The aim of the present research was to formulate the herbal tooth powder for prevention of oral diseases. It does not cause any harmful effects, instead, it imparts good freshness and away from bad Odour. Oral hygiene can be maintained in a reliable, safe, and inexpensive way by using herbal tooth powder.

Gayatri Pralhad Gangurde

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.

MR. VISHAL SUBHASH EDAKE

Herbal tooth powders consisting of various ingredients that are available in the market in a wide range. Hence modern methods focusing on these aspects are useful for the standardization of herbs and their formulations. Consumers believed by using herbal-based toothpowders are safe, effective, and less toxic. Dental caries is an infectious disease, causes damage and infection of enamel and dentine. If it is not treated, the infection continues and will lead to tooth loss. Saliva is the major element proposed for lubricate the food and to maintain an appropriate environment in the mouth. Denitrifies are the product which is used to maintain the Oral Hygiene such as Freshness of mouth andto avoid tooth decay. The oral hygiene can be maintained throughout the day by using various dentifrices prepared by herbal and synthetic ingredients.

Bharathi M

Herbal tooth powders consisting of various ingredients that are available in the market in a wide range. Hence modern methods focusing on these aspects are useful for the standardization of herbs and their formulations. Consumers believed by using herbal-based toothpowders are safe, effective, and less toxic. The oral cavity infections are the most common types of infections. Dental caries is an infectious disease, causes damage and infection of enamel and dentine. Therefore, in the present work, the following aspects of Herbal tooth powders were planned for the formulation, standardization of herbal tooth powder, and anti-bacterial screening of the extracts of herbal tooth powder.

AIM AND OBJECTIVES :

Aim :

Formulation and Evaluation of Herbal Tooth Powder.

Objective:

- It promote teeth whitening.
- It is reduces tooth decay, toothache and gum bleeding.
- It is eliminate bad breath. It protects teeth, reduces inflammation and prevents plaque formation.
- The formula contains fresh ingredients, is very safe, environmentally friendly and does not cause problems.

DRUG AND EXPERIMENTAL PROFILE :**1. ROSEMARY LEAVES****Fig No.1 ROSEMARY LEAVES**

Synonyms: Polar Plant, Compass Plant, Compass Weed.

Biological Source: Rosemary composed of dried leaves and flowers constitutes a particularly interesting source of biologically active phytochemicals as it contains a variety of phenolic compounds including carnosol, carnosic acid, rosmanol, 7-methyl-epirosmanol, isorosmanol, rosmadial and caffeic acid, with substantial in vitro antioxidant activity.

Family: Lamiaceae

Chemical Constituents: Triterpenes, phenolic diterpenes and phenolic acids including rosmarinic acid, carnosic acid, rosmanol, carnosol, ursolic acid and betulinic acid.

Plant part used : Leaves

Uses :

- Antimicrobial
- Anti-inflammatory

2. GUAVA LEAVES



Fig No.2 GUAVA LEAVES

Synonyms: Strawberry guava, true guava, yellow cattley guava, guava bush, *Psidium littorale*, *psidium-guajava*.

Biological Source : Guava (*Psidium guajava*), small tropical tree or shrub of the cultivated for its edible fruits.

Family: Myrtaceae

Chemical Constituents: The fruit contains saponin, oleanolic acid, lyxopyranoside, arabopyranoside, guaijavarin, quercetin and flavonoids.

Plant part used : Leaves

Uses:

- These reduce the pain by reducing the inflammation of the tooth.
- Guava leaves have long been used effectively for oral hygiene due to their antibacterial and antimicrobial properties.

3. BABUL SAL



Fig No. 3 BABUL SAL

Synonyms: Babul, baboul, *vachellia nilotica*.

Biological Source: *Vachellia nilotica*, more commonly known as *Acacia nilotica*, and by the vernacular names of gum Arabic tree, babul, thorn mimosa.

Family: Fabaceae

Chemical constituents: Methionine, lysine, lupenone, lupeol, Niloticane.

Plant part used: Bark

Uses:

- Using Babul Gum Powder once a day will help reduce joint pain due to its antibacterial and anti-inflammatory properties.
- The paste made from babul leaf powder and coconut oil helps control oral problems like plaque and gingivitis due to its antibacterial properties.

4. STEVIA LEAVES

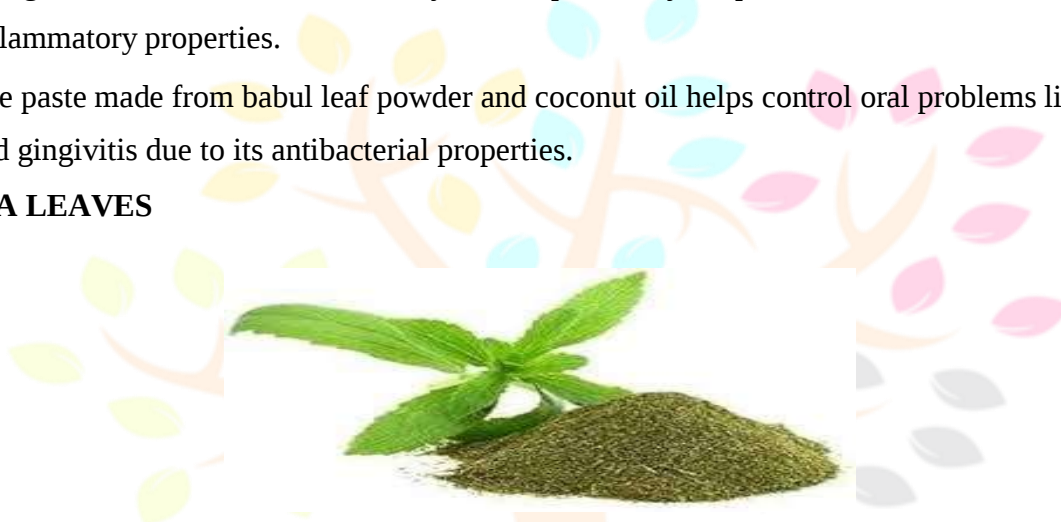


Fig No.4 STEVIA LEAVES

Synonyms : Candy leaf, sweet leaf or sugar leaf.

Biological Source : Stevia sweeteners are derived from the leaves of the *Stevia rebaudiana* (Bertoni) plant, an herbal shrub native to South America.

Family: Lamiaceae

Chemical composition : Stevia extracts generally contain a high percentage of the glycoside diterpenes stevioside (CAS no. 57817-89-7) and rebaudioside A (CAS no. 58543-16-1), the principal sweetening compounds, and smaller amounts of other steviol glycosides.

Plant part used : Leaves

Uses:

- A natural, non-caloric sweetener stevia has recently received much interest for use in oral hygiene products as it is proved to be potent antimicrobial without local side effects.

5. BLACK SALT



Fig No.5 BLACK SALT

Synonyms : Himalayan salt and sulemani salt

Chemicals compositions: Black salt mainly consists of sodium chloride and a trace amount of sodium sulphate, sodium bisulfate, sodium bisulfite, sodium sulfide, iron sulfide and hydrogen sulfide. Due to the presence of iron and other minerals, the salt is pinkish grey in color.

Uses :

- Black salt is rich in antioxidants and surprisingly low in sodium.
- It also contains important minerals such as iron, calcium and magnesium, which are important for a healthy body.

6. CLOVE



Fig No.6 CLOVE

Synonyms: Caryophyllum, Clove flower, Clove buds.

Biological Source: Clove consists of dried flower buds of *Eugenia caryophyllus*. It should contain not less than 7.0 per cent (w/w) of eugenol calculated on dried basis.

Family: Myrtaceae

Chemical Constituents: Clove contains about 15 to 20 percent of volatile Oil, 10 percent to 13 percent of tannin (gallotannic acid), resin, chromone and eugenin. The volatile oil of the drug contains eugenol (about 70 to 90 percent).

Plant Part used: Dried flowers buds

Uses :

- Cloves are used as toothpowder carminatives, stimulants, sweeteners, aromatics and antiseptics.

7. CAMPHOR



Fig No.7 CAMPHOR

Synonyms: Turpentine, Rose oil, camphor, resin, menthol.

Biological Source: Camphor is a solid keton, obtained from the volatile oil of *Cinnamomum camphora*.

Family: Lauraceae

Chemical constituents: D-camphor(51.3%), 1,8-cineole, linalool, terpineol

Plant part used: Wood

Uses:

- It is used in many toothpowder to relieve pain such as colds, insect bites, fever, and hemorrhoids.
- Camphor has many cosmetic uses due to its antibacterial, antifungal and anti-inflammatory properties.

8. ALUM



Fig No.8 ALUM

Synonyms : Turuti

Uses :

- It is used as a flocculant in the cleaning of drinking water.
- Help the pickles become crispy.
- Flame delayer.

9. TRIPHALA

a) AMLA



Fig No.9 AMLA

Synonyms : Dhatri, Amlaka, Adiphala (Sanskrit) Amla, Amlika, Aonla (Hindi) .

Biological Source : *Phyllanthus emblica* L. (popular known as amla or Indian gooseberry) is an ephemeral tree .

Family : Euphorbiaceae.

Chemical constituent : Higher amount of polyphenols like gallic acid, ellagic acid, different tannins, minerals, vitamins, amino acids, fixed oils, and flavonoids like rutin and quercetin.

Plant part used: Fruit

Uses :

- It helps reduce salivary glucose levels, promoting good oral health and addressing issues like gum recession.

b) BEHEDA



Fig No.10 BEHEDA

Synonyms : Baheda, Bahera, Behada, Beleric or Bastard Myrobalan

Biological Source : It consists of dried ripe fruits of the plant *Terminalia belerica* Linn.

Family : Combretace

Chemical constituents : Tannin, pseudo tannins, gallic acid, chebulic, chebulagic, chebulinic acids, non-chebulic acid, ellagitannins, corilagin, ellagic acid, triterpenes and triterpenoidal glycosides are among the compounds found in behada.

Plant part used: Fruit

Uses:

- It helps in eliminating bad breath and bacteria from the oral cavities and thus prevents swelling, bleeding and other oral problems.

c) HIRDA :



Fig No.11 HIRDA

Synonyms: Hirda, Harida, Buceral chebula, Abhaya, kayastha, katukka.

Biological Source: It's commonly known as black or chebulic myrobalan is a species of Terminalia.

Family: Combretaceae

Chemical constituents: Neo-chebulic acid, 1, 6 dio-galloyl-0-glucose, Gallic acid(3,4,5-Trihydroxy-benzoic acid).

Plant part used: Fruit

Uses :

- Harada helps prevent cough and cold.

10. PUDINA LEAVES



Fig No.12 PUDINA LEAVES

Synonyms: Oleum mentha piperita, Colpermin, Mentha Oil.

Biological Source: It is obtained from fresh flowering tops of the plants known as Mentha piperita Linn.

Family: Labiatae.

Chemical Constituents: Peppermint oil contains chiefly menthol to the extent of 70 per cent. Other important constituents of the peppermint oil are menthone, menthofuran, jasmone, menthyl acetate.

Plant part used : Leaves

Uses :

- Peppermint or peppermint oil is used as a carminative (anti-inflammatory), stimulant and sweetener.
- It also has mild antibacterial properties.

11. RITHA



Fig No.13 RITHA

Synonyms: Soapnut, Soapberry, Washnut, Ritha, Aritha. **Biological**

Source: It is obtained from *Sapindus mukorossi* **Family:** Sapindaceae

Chemical Constituents: Saponins are the major active constituent of the fruit pulp. Mukorosside is one of the saponins isolated from the fruit rind.

Plant part used: Fruit

Uses :

- Soapberry fruit is used to obtain a rich foam and pleasant aroma.
- Soapberry fruit is used as a detergent for fabric before dyeing.

12. FENNEL



Fig No.14 FENNEL

Synonyms: Sauf

Biological source: Fennel, (*Foeniculum vulgare*), perennial herb of the carrot.

Family : Apiaceae

Chemical constituents: Fennel contains volatile oil (1-4%), fixed oil (9-12%) and proteins (20%).

Plant part used: Fruit

Uses :

- Fennel can be used to treat many digestive problems in babies, including heartburn, gas, bloating, loss of appetite, and colic.

13. BLACK PAPPER



Fig No.15 BLACK PEPPER

Synonyms: Pepper, piper nigrum, maricha.

Biological Source: Pepper is the dried unripe fruit of perennial climbing vine piper nigrum Linn.

Family: Piperaceae

Chemical constituents: Piperine, starch piperidine, l-phellandrene, caryophylling

Plant part used: Fruits

Uses :

- Aromatic, stimulant, emollient, carminative, condiment, stimulates the stomach and gastric secretory buds.
- Rich in antioxidants.
- It is high blood sugar control.

14. TULSI



Fig No.16 TULSI

Synonyms: Tulsi, holy basil, padina pavonica ,sacred basil.

Biological Source: It consists of dried powder of the leaves of the plant *Ocimum sanctum* Linn.

Family: Lamiaceae

Chemical constituents: Eugenol, tannin, vitamin C, tartaric acid, volatile oil, carvacrol, fixed oil, alkaloids, flavonoids, saponins.

Plant part used: Leaves

Uses :

- It can also be used alone to help heal mouth ulcers.
- Tulsi helps reduce pain and may help reduce stress and lower blood pressure.

15. MADHUNASHINI :

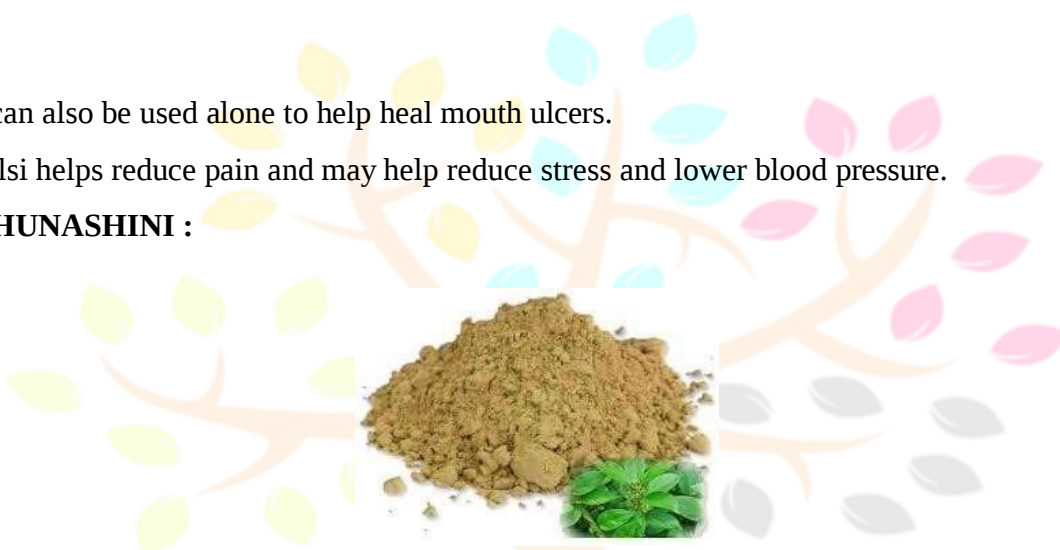


Fig No.17 MADHUNASHINI

Synonyms : Gudmar, gymnema.

Biological Source: It consists of the leaves of a perennial woody climber plant known as *Gymnema Sylvestre*.

Family: Asclepiadaceae

Chemical Constituent: It contains pentriacontae, hentriacontane, phytin, alpha and beta chlorophylls. Gymnastic acid (anti-sweet compounds), the mixture of triterpene saponins and antraquinone derivatives.

Plant part used: Leaves

Uses:

- Stimulant, stomachic, laxative and diuretic.
- Anti- diabetic due to indirect stimulation of insulin secretion from pancreas.

PLAN OF WORK:

Sr. No.	Activity	Tentative Time
1.	Literature survey	Throughout semester
2.	Selection of drug	2 Week
3.	Procurement of drug and excipients	2 Week
4.	Experimental work	2 Months
5.	Data completion, thesis writing, printing and binding	1 Month

MATERIALS AND METHOD:

Sr. No.	Ingredients	Quantity Taken	Role of Ingredients
1.	Rosemary Leaves	1.75 gm	Antiseptic
2.	Guava Leaves	3.5 gm	Antibacterial
3.	Babul Sal	6 gm	Cleaning of teeth
4.	Stevia Leaf	6.75 gm	Sweetner
5.	Black Salt	5.25 gm	Cleaning
6.	Clove	3.5 gm	Dental Analgesic
7.	Camphor	1.75gm	Analgesic
8.	Alum	4.25 gm	Antiinflammatory
9.	Triphala (Amala, Beheda, Hirda)	2.25 gm	Astringent
10.	Pudina Powder	2.25 gm	Antifungal
11.	Ritha	2.5 gm	Foaming
12.	Fennel	3.25 gm	Mouth Freshener

13.	Black Pepper	2 gm	To treat mouth ulcer
14.	Tulsi	2 gm	Bactericidal
15.	Madhunashini	2.5 gm	To remove stains of teeth

Table No.1 Formulation of herbal toothpowder

Procedure:

All medicines are collected from local stores. This material is ground into powder and used in the preparation of herbal toothpowder. Sift the plant powder with a size 75 sieve. The composition of the developed formulation is summarized the table no.1

Formulation:



Fig. no. 18

EVALUATION OF HERBAL TOOTH POWDER

The prepared herbal tooth powder was evaluated for its various parameters such as organoleptic, physico-chemical, rheological evaluation.

1. Organoleptic Evaluation

Organoleptic characteristics for various sensory characters like colour, odour, taste was carefully noted down as illustrated. The raw drugs and powder were separately studied by organoleptic and morphological characters like colour, odour, texture, and appearance.

Colour : The prepared tooth powder was evaluated for its colour. The colour was checked visually under normal lamp.

Odour : Odour was checked by smelling the product.

Taste : Taste was manually checked by tasting the product.

2. Physico-chemical Evaluation

The physical and chemical feature of the herbal tooth powder was evaluated to determine the pH, its moisture content the amount of inorganic matter present in it.

pH :

PH of formulated herbal tooth powder was observed by using pH meter. 5gm of tooth powder placed in 100ml of beaker. Allow the 10ml of boiled and then cool water. Stir vigorously to make a suspension and measured the pH.



Fig. no. 19

Moisture Content :

Tooth powder (10gm) weighed and dried it in the oven at 105o C then it was cooled. The loss of weight is recorded as percentage moisture content and calculated by the given formula

$$\% \text{ Moisture content} = \frac{\text{Original sample weight} - \text{Dry sample weight}}{\text{Original sample weight}} \times 100$$



Fig. No. 20



Fig. No. 21

3. Rheological Evaluation

Physical parameters like bulk density, foaming test, angle of repose were observed and calculates for the formulation.

Bulk Density :

50 gm of powder accurately weighed and carefully introduced into a 100 ml graduated measuring cylinder. The cylinder dropped at 2 seconds interval onto a hard surface three times from a height of the 1 inch to equalize upper surface of powder. Then the volume of powder noted and the bulk density in gm/ml calculate as,

$$\text{Bulk Density} = \frac{\text{Wt. pf drug}}{\text{Bulk volume}}$$



Fig. No. 22



Fig. No. 23

Foam test :

The foamability of the product was evaluated by taking 2gms of tooth powder with water in a measuring cylinder initial volume was noted as v_1 and then shaken for ten times. Final volume of foam was noted v_2 .



Fig. No. 24

Flow Property :

A funnel was taken and fixed with a clamp to the stand. A graph paper was kept below the funnel and the height between graph paper and bottom of the funnel was measured. Then 50gm of powder was weighed and poured into funnel by blocking the orifice of the funnel by thumb, the thumb was removed. The powder started flowing down onto the graph paper and formed a cone shaped pile until the peak of pile become touched to the bottom of the funnel stem. Then, the angle of repose was calculated by following formula.

$$\tan \theta = H/R$$

H = Height of powder, R = Radius of graph paper



Fig. No. 25

RESULT AND DISCUSSION:

In this study, herbal toothpowder was developed and analyzed. Its sensory properties are yellow- green and it has sweet properties. The moisture content of the powder was found to be 1.64%. The density of the powder is 4 grams or milliliters. To understand the fluidity, the angle of repose was measured and the results showed good fluidity. The pH of this recipe is 5. Strategies to prevent tooth decay include destroying cancerous cells that form plaque in the mouth, preventing plaque formation, and making teeth resistant to demineralization.

1. Organoleptic Evaluation:

Sr.No	Parameters	Result
1.	Colour	Yellowish green
2.	Odour	Characteristics
3.	Taste	Sweet
4.	Texture	Fine
5.	Appearance	Powder

Table No. 2 Organoleptic evaluation of herbal tooth powder

2. Physic-chemical Evaluation:

Sr. No.	Parameters	Result
1	pH	5.07
2	Moisture content	1.64

Table No.3 Physic-chemical evaluation of herbal tooth powder

3. Rheological Evaluation:

Sr.no	Parameters	Result
1.	Bulk density	4gm/ml
2.	Foam	Present
3.	Angle of repose	48.74

Table No.4 Rheological evaluation of herbal tooth powder

CONCLUSION:

This study concluded that herbal tooth powder are valuable in dental research, are easily accepted, and are safer than synthetic products with fewer side effects. The tooth powder formula maintains dental and oral hygiene and shows anti-bacterial properties. Herbal tooth powder shows great promise in naturopathic research and public health. Therefore, in this study, a herbal tooth powder that gave excellent results was developed and evaluated for its anti-inflammatory properties. The ingredients used in this study were examined and selected to have antibacterial properties and maintain oral hygiene. This makes it a good tooth powder as claimed in its benefits. It does no harm, on the contrary, it gives freshness and does not smell bad. Use tooth powder to maintain oral hygiene reliably, safely and cost-effectively.

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