



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 review article 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. Ginger, turmeric, baking soda, camphor, amla powder, stevia powder, pink Himalayan salt, lemon 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, foam ability, and abrasiveness.

KEYWORDS: Natural Ingredient, ginger, camphor, turmeric, stevia, lemon.

INTRODUCTION :-

WHO estimates that 80% of the world's population, particularly those living in developing nations, rely on plant derived medications for their healthcare, and there is growing interest in traditional medicine worldwide.[8] Natural products are secure, affordable, and work as strong substitutes for the chemotherapeutics now in use, which have negative side effects and increased bacterial resistance. India, a country renowned for its ancient medical practices, has long been intrigued by the search for alternative therapeutic modalities including natural items.[2]

To prevent and manage bad breath and tooth decay, dentifrice can be used as a preventative cosmetic treatment for teeth. Dentifrice can be made using both natural and artificial substances. When opposed to formulations using synthetic ingredients, herbal formulations are now highly demanded and necessary due to their effectiveness in preventing adverse effects. Based on their abrasive qualities, tooth powders and pastes are applied to the teeth and rub against them, helping to remove the minerals and food particles that have been deposited there. [10,11]

Tooth powder was historically used by the Romans to clean and whiten teeth, to fix them when loose, to strengthen the gums, and to prevent toothache. They made tooth powder from a variety of substances, such as the bones, hoofs, and horns of certain animals, crabs, oyster and murex shells and egg shells. These ingredients were reduced to fine powder, sometimes after having been previously burnt. Some versions contained honey, myrrh, salt and hartshorn. The use of powdered substances such as charcoal, brick, salt for cleaning teeth has been historically widespread in India, particularly in rural areas [3] Shilpa reference

Mainly due to the negligence in good caring of the tooth, so it can be prevented and controlled by proper brushing by using effective toothpaste and tooth powders. Dentifrice can be used as a prophylactic cosmetic for the tooth to avoid tooth decay and bad breath. Dentifrice can be prepared by synthetic and herbal ingredients nowadays herbal formulation is high in demand due to its effectiveness, to avoid the side effects when compared with synthetic formulations. Toothpaste and tooth powders are based on its abrasive property, the paste and powder apply on the tooth to rub against the tooth which helps to eliminate the deposited food debris and minerals from tooth. "Oral health is essential to good health and quality of life [1]

The three most significant dental problems are calculus, plaque, and periodontal infections. Calculus is formed as a result of mineralized deposition, which is mostly brought on by bacterial action. These illnesses can be treated and prevented by brushing properly and using effective toothpastes and tooth powders because they are primarily brought on by neglect in adequate dental care.[5] Dental plaque are sticky films that coats teeth and may contain bacteria. Dental plaque hardens and becomes challenging to remove if it is not eliminated while it is still soft.[6] Tooth damage from dental plaque can result in tooth decay or tooth loss. A severe gum infection called periodontitis can kill the jawbone in addition to causing gum and bone damage [4] Although frequent, periodontitis is largely avoidable. Usually, inadequate dental hygiene is the culprit. Loss of teeth can result from periodontitis. [7]

Need and objectives :-**Need for Herbal Tooth Powder**

1. **Natural Ingredients:** Many people prefer using products with natural ingredients to avoid the potential side effects of synthetic chemicals found in some commercial toothpaste.
2. **Oral Health Benefits:** Herbal tooth powders often contain ingredients known for their antimicrobial, anti-inflammatory, and antiseptic properties, which can help maintain oral hygiene, reduce gum inflammation, and prevent cavities.
3. **Sensitivity Concerns:** Some individuals experience sensitivity or allergic reactions to certain ingredients in commercial toothpaste. Herbal tooth powders can provide a gentler alternative.
4. **Environmental Impact:** Herbal tooth powders typically come in eco-friendly packaging, reducing plastic waste compared to traditional toothpaste tubes.
5. **Cultural and Traditional Practices:** In many cultures, the use of herbal tooth powders has been a longstanding tradition for maintaining oral health.

Objectives of Herbal Tooth Powder

1. **Promote Oral Hygiene:** To effectively clean teeth, remove plaque, and prevent dental issues such as cavities and gum disease.
2. **Reduce Oral Inflammation:** To soothe and reduce inflammation of the gums, often using anti-inflammatory herbal ingredients.
3. **Fight Bacteria:** To inhibit the growth of harmful bacteria in the mouth, using natural antimicrobial agents.
4. **Freshen Breath:** To provide a natural and refreshing taste, often using ingredients like mint or clove.
5. **Provide a Safe Alternative:** To offer a product free from synthetic additives, preservatives, and artificial flavour's, catering to individuals seeking a more natural oral care option.
6. **Support Overall Health:** To promote holistic health by using herbs that may have additional health benefits beyond oral care, such as improving digestion or boosting immunity.
7. **Cater to Specific Needs:** To address specific dental concerns such as sensitivity, whitening, or strengthening of teeth through carefully selected herbal ingredients.

DRUG PROFILE :**1.GINGER****General Information**

- **Common Name:** Ginger
- **Botanical Name:** *Zingiber officinale*
- **Family:** Zingiberaceae

Active Constituents

- **Gingerol**
- **Shogaol**
- **Zingerone**
- **Paradols**
- **Essential Oils:** Such as zingiberene, β -bisabolene, and sesquiphellandrene
- **Vitamins and Minerals:** Including vitamin C, vitamin B6, magnesium, and potassium.

Medicinal Uses

1. Inflammatory Conditions
2. Pain Relief
3. Antibacterial Properties
4. Antioxidant Benefits
5. Freshens Breath
6. Strengthens Oral Immunity



Benefits of Using Ginger Tooth Powder

1. **Natural and Safe:** Free from synthetic chemicals, making it a safer choice for those with sensitivities.
2. **Effective Oral Hygiene:** Helps in cleaning teeth, reducing plaque, and maintaining fresh breath.
3. **Holistic Care:** Provides additional health benefits due to its anti-inflammatory, antibacterial, and antioxidant properties.
4. **Eco-Friendly:** Typically comes with minimal packaging, reducing environmental impact.

2. TURMERIC

General Information

- **Common Name:** Turmeric
- **Botanical Name:** *Curcuma longa*
- **Family:** Zingiberaceae

Active Constituents

- **Curcuminoids:** The most active compounds, with curcumin being the primary one, responsible for most of turmeric's medicinal properties.
- **Essential Oils:** Including turmerone, atlantone, and zingiberene, which contribute to its therapeutic effects.

Uses of Turmeric in Tooth Powder

Antibacterial Properties

Turmeric has potent antibacterial properties, which help in combating oral bacteria responsible for plaque, cavities, and bad breath.

Anti-Inflammatory Effects

The anti-inflammatory properties of curcumin in turmeric can help soothe inflamed gums and reduce symptoms of gingivitis and other gum diseases.

Antioxidant Benefits

Turmeric is rich in antioxidants, which help protect the tissues in the mouth from oxidative stress and damage, promoting overall oral health.

Whitening Effect

Turmeric is known for its natural whitening effects on teeth, helping to remove surface stains and improve the overall appearance of teeth.

Pain Relief

The analgesic properties of turmeric can help reduce toothache and gum pain, providing relief from discomfort.

Benefits of Turmeric

1. Natural and Safe
2. Effective Oral Hygiene
3. Holistic Care
4. Eco-Friendly

5. Teeth Whitening.

**3.BAKING SODA***General Information*

- **Common Name:** Baking Soda
- **Chemical Name:** Sodium Bicarbonate
- **Formula:** NaHCO_3

Uses in Oral Care

1. Teeth Cleaning
2. Whitening
3. Odor Neutralization.
4. pH Balance

Benefits of Baking Soda

1. Natural and Safe
2. Effective Oral Hygiene
3. Teeth Whitening
4. Affordable and Accessible
5. pH Balance

**4.AMLA***General Information*

- **Common Names:** Amala, Indian Gooseberry
- **Botanical Name:** *Phyllanthus emblica*
- **Family:** *Phyllanthaceae*

Medicinal Uses of Amla in Tooth Powder

1. Antimicrobial Properties
2. Anti-inflammatory Effects
3. Strengthens Teeth
4. Antioxidant Benefits
5. Promotes Oral Hygiene
6. Alleviates Toothache
7. Prevents Bad Breath

Active Constituents

- **Vitamin C (Ascorbic Acid)**
- **Tannins:** Including emblicanin A, emblicanin B, punigluconin, and pedunculagin, which have antioxidant properties.
- **Flavonoids:** Such as quercetin and kaempferol, which have anti-inflammatory and antioxidant effects.
- **Phenolic Compounds:** Contributing to its antioxidant capacity.
- **Alkaloids:** Bioactive compounds with various therapeutic properties.
- **Amino Acids:** Essential for protein synthesis and overall health.
- **Minerals:** Including calcium, iron, and phosphorus, which are important for various bodily function

5.Stevia

Common Names: *Stevia*, Sweet leaf, Sugar Leaf

Botanical Name: *Stevia rebaudiana*

Plant Family: Asteraceae

Active Constituents

- **Steviol Glycosides:** The primary sweetening agents, including:
 - **Stevioside**
 - **Rebaudioside A**
 - Rebaudioside C
 - Dulcoside A

Medicinal Uses

1. Antimicrobial Properties
2. Anti-inflammatory Effects
3. Non-Cariogenic
4. Promotes Gum Health
5. Natural Sweetener
6. Antioxidant Benefits



Benefits of stevia in Tooth Powder

1. Antimicrobial Properties
2. Non-Cariogenic
3. Anti-Inflammatory Effects
4. Natural Sweetener
5. Low Caloric Content
6. Safe for Diabetics
7. Potential Healing Properties
8. Natural Origin

6.PINK HIMALAYAN SALT

Common Name: Pink Himalayan Salt

Biological Name: Halite

Family: Halite is a mineral form of sodium chloride (NaCl).

Active Ingredient:

The active ingredient in Pink Himalayan salt is sodium chloride, but it also contains trace minerals such as potassium, magnesium, calcium, iron, zinc, copper, and manganese.

Medicinal Use in Tooth Powder:

Pink Himalayan salt is sometimes included in tooth powders for its purported benefits to oral health:

- **Antibacterial Properties**
- **Mineral Content**
- **Balancing pH**
- **Natural Cleansing**



Benefits of Pink Himalayan Salt

- **Mineral-Rich:** Contains trace minerals that are beneficial for overall health.
- **Natural:** Less processed than table salt, retaining more of its natural mineral content.
- **Mild Flavor:** Provides a pleasant taste without the harshness of synthetic chemicals.
- **Hygienic:** Helps maintain oral hygiene by supporting natural antibacterial properties.

7. LEMON

- **Common Name:** Lemon
- **Biological Name:** Citrus limon
- **Family:** Rutaceae

Active Ingredients

Lemons contain citric acid, vitamin C (ascorbic acid), flavonoids (such as quercetin and hesperidin), and various essential oils.

- **Medicinal Uses and Benefits:**
 - Rich in Vitamin C
 - Antioxidant Properties
 - Anti-inflammatory
 - Oral Health



- **Use in Tooth Powder:** Lemon powder or lemon essential oil is sometimes included in tooth powders for its antibacterial properties and refreshing taste. It can help combat bacteria in the mouth and contribute to overall oral health.

Plan of work:-

▪ Literature Survey

Literature survey was carried out by Goggle search, Journalsetc.

▪ Collection of raw material

All the natural material used in present study i.e. Powder of ginger, turmeric are home made. And some ingredients such as amla powder, baking soda, stevia powder, pink Himalayan salt and lemon are purchased from themarket.

▪ Methods of data collection

Observation method of the data collection will be employed for the collection of data for the present dissertation work. Data on the Formulation and Evaluation of herbal tooth powder will be collected from various standard journals and other sources like research literature databases such as Springer, Research Gate, Google scholar, Yahoo Gov, etc.

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

METHOD OF PREPARATION :-

All herbs of crude drugs are collected and dried undershade.



Drying under shade will retain active constituents.



Hence, shade drying is preferred over artificial drying.



The dried crude drugs were made into coarse powder usingmixer.



Later on, all these coarsely powdered drugs are passedthrough mesh number 80.



this, obtained powders are blended together to get uniformmixture.



Finally, prepared herbal tooth powder was placed well closed container. (17,18)

Table 2: Formula

Sr. No.	Ingredients	Quantity Taken	Uses
1.	Ginger	3gm	Dental analgesic
2.	Turmeric	3gm	Analgesic
3.	Baking soda	3gm	Tooth Whitening
4.	Amla	3gm	Gum Strengthening
5.	Stevia	3gm	Anti-bacterial, Sweetening agents
6.	Pink Himalayan salt	3gm	Natural Cleansing
7.	Lemon	2gm	Anti-oxidant properties

EVALUATION PARAMETERS :-

Following evaluation parameters were preferred to ensure superiority of prepared herbal toothpowder.

1.ORGANOLEPTIC CHARACTERS

The sample was evaluated for organoleptic characters using parameters like appearance, colour, odour and taste.

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

Odour: Odour was found by smelling the product.

Taste: Taste was checked manually by tasting the product.

Particle Size: Particle size was assessed using the sieving method utilising I.P. Standard sieves by mechanically shaking for 10 minutes. Particle size is a parameter that affects many qualities including spread ability, grittiness, etc.

Foamability: By adding a little amount of the preparation to water in a measuring cylinder, noting the initial volume, and shaking the cylinder ten times, the product's foamability was assessed. Foam's last volume was recorded.

Moisture Content: The tooth powder (20gm) was weighed, dried at 105° C in the oven, and then chilled. The method presented (8) is used to calculate the weight loss and record it as a percentage of moisture content.

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

Bulk Density: The bulk density of the powder is the ratio of the mass of an untapped powder sample and its volume including the contribution of the inter-particulate void volume. It is expressed in gram/ml.

Bulk density = Untapped density – tapped density.

Angle of repose: It is defined as the maximum angle possible in between the surface of pile of powder to the horizontal flow.

RESULT :-

Dental caries are the most common oral infectious disease among children and old age. The prevention strategy against dental caries includes the elimination of carcinogenic microorganisms from the oral cavity, inhibition of their plaque formation, and the enhancement of tooth resistance to demineralization. In the former strategies, phytochemicals have been widely studied for their antimicrobial activity. A variety of plants with potent activity are known to be traditionally used for dental hygiene world- wide. Antibiotics and other antimicrobial agents are effective in the prevention and treatment of dental caries

CONCLUSION:-

Natural plant products are an important source to control bacterial pathogens. Therefore, in the Present study, a herbal tooth powder was developed And evaluated for antimicrobial activity which has Shown excellent results. The ingredients are used in the present work, was screened and selected to Possess anti-microbial effect and to maintain oral Hygiene as it claimed by its results as effective tooth Powder. Our herbal tooth powder is considered safe to use twice a day and it does not cause any harmful effects.

REFERENCES

- 1) International journal of creative research thought (IJCRT) Formulation and evaluation of herbal tooth powder, ISSN:2320-2882
- 2) Evans WC Trees and Evans Pharmacology London WB, Saunders Company Ltd Fox R. Pharmaceuticals from plants: Great Potential, few funds. Lancet, 1997,(XIV) 343: 1513-1515.
- 3) International journal of pharmacy and pharmaceutical research, an official publication of human journals, Human Journals Review Article March 2023 Vol.:26, Issue:4 © All rights are reserved by SHILPA SANTHOSH et al.
- 4)International journal of advanced research in science , communication and technology(IJARSCT)a review article on herbal tooth powder by nandini patil
- 5) Mohire N C. Yadav A V. Chitosan-based polyherbal toothpaste: as novel oral hygiene product. Indian Journal of Dental Research, 2010, 21(3), 380384.
- 6) Dental plaque <https://g.co/kgs/XfUDGB>
- 7) Arbes S, Agustsdottir H, Slade G Environmental tobacco smoke and periodontal disease in the U.S. Am J Public Health (2001) 91:253-257
- 8)International journal of novel research and development (IJNRD) a review article on herbal tooth powder by rohit sharma
- 9) WHO (2008) Traditional medicine Fact sheet No. 134
- 10) D. Mamatha IOSR Journal of pharmacy and biological Sciences (Nov.Dec.2017) ,VII,15
- 11) Rantamen I, et al. Effects of a betaine containing toothpaste on subjective symptoms of dry mouth: A randomized clinical trial. The J. of Cont. Dent. Practice. 2003; 4(2):1-10

