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Review

A Review on: Dragon fruit- based herbal toothpaste

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Abstract

Dragon fruit (Hylocereus undatus) is rich in fiber, vitamin C, antioxidants, and bioactive Compoundsthat contribute to oral health. The fiber content assists in mechanical cleaning by Binding to plaque and food debris, thereby preventing gum disease. Vitamin C acts as a Powerful antioxidantthat strengthens gum tissue and supports healing of the oral mucosa. Herbal toothpaste formulations containing dragon fruit, along with other natural ingredients, can help combat common oral problems such as dental caries, gingivitis, halitosis, calculus Formation, enamel erosion, and dentin hypersensitivity. These formulations are designed to Deliver maximum bioavailability of active constituents while providing effective cleaning. Polishing, and protection of teeth. Compared to chemical-based toothpastes, herbal Toothpastes offer similar or better efficacy with fewerside effects, making them a safer and Eco-friendly alternative for maintaining oral hygiene and promoting overall oral health.

Focus: Study the potential and role of dragon fruit in herbal toothpaste formulation.

Purpose: To review its properties, benefits, and formulation scope for improving oral hygiene and promoting natural dental care.

Keywords: Herbal toothpaste, herbal ingredients, oral hygiens, submuosal fibrosis.

INTRODUCTION

Dental plaque is the main cause of dental caries and gum diseases such as gingivitis. Bacteria Present in plaque convert sugars from food into acids that erode the tooth enamel, leading to Cavities and inflammation of the gums. If untreated, these conditions can progress into more Severe and painful oral infections. Regular use of

toothpaste is essential for maintaining oral. Hygiene and preventing such dental problems. In recent years, there has been a growing Preference for herbal toothpastes over conventional chemical formulations due to their natural Composition, safety, and minimal side effects. Dragon fruit (Hylocereus polyrhizus), a nutrient rich tropical fruit, contains vitamins (especially vitamin C and B complex), minerals, fiber, and Potent ant-ioxidants such as carotenoids and flavonoids. These components contribute Significantly to oral and dental health. The fiber present in dragon fruit aids in mechanical Cleaning by binding to plaque and food debris, while its antioxidants protect gum tissues from Oxidative stress and reduce inflammation. Vitamin C helps strengthen gum tissue and prevents The onset of gingivitis. Additionally, its high water content helps maintain moisture in the Mouth, reducing plaque formation. As consumer awareness about natural and herbal oral care Products increases, the demand for effective herbal toothpaste formulations continues to Grow. Toothpaste containing dragon fruit extract offers a promising natural alternative that not Only cleans and protects teeth but also promotes healthier gums and overall oral well-being.

History

Toothpaste has been used since ancient times. Around 500 BC, the Greeks and Romans used early forms of toothpaste made from crushed bones, oyster shells, powdered charcoal, and bark to clean teeth and prevent bad breath. In ancient China, people used ginseng, mint, and salt as cleansing agents, while in India, sticks of Azadirachta indica (neem) were commonly used as natural toothbrushes due to their antibacterial properties. The first modern improvement came in 1824 when Peabody added sodium palmitate (soap) to toothpaste, followed by John Harris in 1850, who introduced chalk (calcium carbonate) as an abrasive. In the 1850s, a creamy form called “Crème Dentifrice” was developed and later mass produced by Colgate in 1873. Washington Sheffield revolutionized packaging in 1892 by introducing the collapsible toothpaste tube. In 1914, fluoride was added for cavity prevention, marking a major advancement in dental care. By the 1980s, antiplaque agents were incorporated to control gingivitis, and research identified enzymes such as glucose oxidase and amyl glucosidase for their natural antimicrobial properties.

Ideal Properties of Herbal Toothpaste

1. Strong abrasive action.
2. Non-toxic and non-irritating.
3. Leave no stains on the teeth Maintain a healthy and clean mouth.
4. Long-lasting impact
5. Accessible and affordable
6. The oral fluid and tissue shouldn’t be harmed.
7. It must not discolor teeth.
8. To remove dental shrine.
9. To stimulate appetite to give a sense of well-being.
10. To maintain the healthy state of mouth, epoxies, teeth and epoxies

BENEFITS OF HERBAL TOOTHPASTE

1. Safely cleans your teeth.
2. Effectively makes your breath fresh.
3. Reduces and prevents gum discomfort.
4. emovesstains.
5. Dragon fruit may help lower cholesterol levels.

Advantages of Herbal Toothpaste

1.Natural and safe with minimal side effects
2.Cost-effective and eco-friendly
3.Provides antioxidant protection to gums and teeth
4.Promotes healing and freshness in the mouth
5.Enhances the visual appeal of toothpaste through its natural pink color
6.Preventing dental diseases is one of its benefits.
7. It makes teeth cleaner.
8.It prevents bad odour.
9.Prevents periodontal disease.
10.Dental issues can be resolved with regular usage of herbal toothpaste.
11.. Herbal toothpaste has no adverse effects.
12. Herbal toothpaste is simple and safe to use, containing natural ingredients without
13. Harsh chemicals.
14. Many herbal formulations are approved by dental associations and may include

15.Fluoride to prevent cavities.
16. Unlike conventional tooth paste, herbal alternatives do not contain sodium lauryl
17. Sulfate or other irritants, reducing gum inflammation and sensitivity.
18. Natural ingredients such as peppermint and spearmint oils help kill oral bacteria and
19.Maintain fresh breath.

A Role of Dragon Fruit i n Herbal Toothpaste

In herbal toothpaste formulations, dragon fruit extract plays several important roles:
1. Antimicrobial Action: Inhibits bacteria such as Streptococcus mutans responsible for tooth decay and plaque formation.
2. Antioxidant Effect: Neutralizes free radicals that can damage oral tissues.
3.Anti-inflammatory Property: Reduces gum inflammation and bleeding.
4. Healing Property: Supports the regeneration of oral tissues due to the presence of vitamin C.
5. Aesthetic and Sensory Benefits: Provides a pleasant color and natural fruity flavor, improving user acceptability.
When combined with other natural ingredients like honey, amla extract, babool bark powder, soapnut extract, spearmint oil, cinnamon oil, and xanthan gum, dragon fruit enhances the overall effectiveness of herbal toothpaste in maintaining oral hygiene.

Characteristics of herb
Pharmacognosy of Herbs
1. Dragon fruit

HERBS	SCIENTIFIC NAME	MECHANISM
DRAGON FRUIT	HYLOCERUS UNDATUS	ANTIOXIDANT
HONEY	APIS MELLIFERA	ANTIBACTERIAL
AMLA EXTRACT	EMBLICA OFFICINALIS	ANTI INFFLAMATORY
BABOOL BARK	ACACIA AREBICA	ASTRINGENT
SAOPNUT EXTRACT	SAPINDUS MUKOROSIS	CLENSING,FOAMING AGENT
XANTHUM GUM	XANTHOMONAS CAMPESTRIS	THICKINING AGENT
SPEARMINT OIL	MENTHA SPICATA	STABLIZER
CINNAMON OIL	CINNAMOMUM ZEYLANICUM	COOLING AGENT

Biologicalsource: Dragon fruit Obtained form the plant Hylocerus undatus.
Family: cactaceae
Synonyms: pitaya,pitahaya
Chemical constituents: pigmentsbetalains Phenolics & flavonoids Vitamin c & mineral
Pharmacological action: Antioxidant antiinflammatory, anti diabetic, cardio Protective, wound healing.
Use: traditional medicine for Diabetes hypertension wound, Healing liver disorder

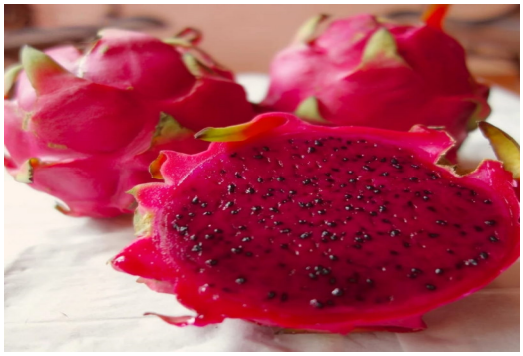

Fig 1:

2. HONEY
Biological Source: Amla extract is Obtained from the dried to fresh fruit of Phyllanthus emblica linn.
Family: Euphorbiaceae.
Chemical constituents: Vitamin C,Tannins Polyphenols, galliC acid
Use: Antioxidant Digestive
Anticancer

Fig 2:

3. AMLA
Biological Source: Amla extract is Obtained from the dried To fresh fruit of Phyllanthus emblica linn.
Family: Euphorbiaceae.
Chemical constituents: Vitamin C,TanninsPolyphenols,galliC acid
Use: Antioxidant Digestive
Anticancer & anti diabetic

Fig 3:

3. BABOOL BARK
Biological Source: Babool bark is Obtained from the stem and Branches of Acacia nilotica.
Family: fabaceae.
Chemical constituents: Tannins, phenolics Compound, Saponins, terpenoids.
Use: strengthen gums & Teeth Prevents gum disease Traditional dental hygiene

Fig 4:

4. SAOPNUT
Biological source: Dry fruit Pericarp of sapindus Mukorosis gaertn.
Synonyms: soapnut, Reeth
Family: sapindaceae.
Chemical Constituent: Tannins, sapoNins.
Uses: antimicrobial.

Fig 5:

5. XANTHUN GUM
Biologicalsource: obtain By fermentation of Carbohydrates by Bacterium xanthomonas Campestris.
Family: xanthomondaceae
Chemical constituents: D Glucose,Dmanos
Use: provide uniform Distribution of API in Toothpaste.

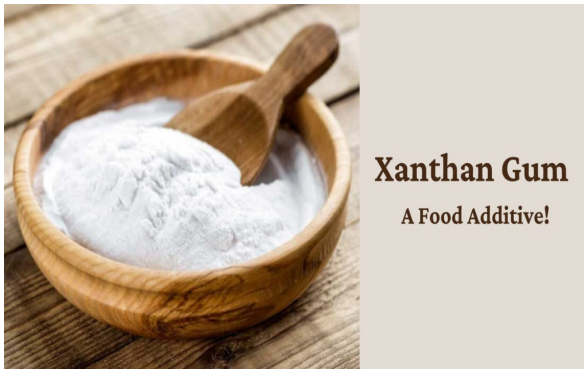

Fig 6:

6. SPEARMINT OIL
Biological source: by Steam distillation of the Fresh flowering tops and Leaves of the plant Mentha spicata linn.
Family: lamiaceae
Chemical Constituents: flavonoids, menthol, menthone.
Uses: moutwash, tooth powder

Fig 7:

7. CINNAMON OIL
Biologicalsource: obtained By steam distillation of Bark and leaves of the Plant cinnamomum Zeylanicum.
Family: lauraceae
Chemical constituents: Eugenol, cinnamic acid.
uses: flavouring agent in Mouthash, gargles and Oral care product.

Fig 8:

CONCLUSION

Dragon fruit-based herbal toothpaste offers a natural, safe, and effective alternative to conventional chemical formulations. The presence of bioactive compounds with antioxidant, antimicrobial, and anti-inflammatory properties contributes to improved oral hygiene, prevention of dental caries, and maintenance of healthy gums. The formulated toothpaste, evaluated through various physicochemical and performance parameters, demonstrated desirable characteristics comparable to commercial products. Its natural composition ensures minimal side effects, cost-effectiveness, and environmental friendliness. Overall, incorporating dragon fruit in herbal toothpaste represents a promising and sustainable approach to enhancing oral health and hygiene.

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