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Formulation and Evaluation of Herbal Toothpastes

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Abstract: *Toothpastes are primarily used to maintain oral hygiene. It also functions as an abrasive, helps in removing dental plaque and food particles from the teeth, assists in the removal of halitosis, and release active chemicals like fluoride to help prevent tooth and gum disease. The present study aims to formulate herbal toothpaste comprising of guava leaves, fenugreek, clove and pomegranate peels. Herbal toothpastes were prepared by using different concentrations of various ingredients and the best was selected. The toothpastes were evaluated using variety of methods such as pH, spreadability, foamability. The herbal ingredients used are good antibacterial. This research presents good scope in future dental research and dental health of public.*

Keywords: Herbal toothpastes, guava, neem, fenugreek, evaluation parameters

I. INTRODUCTION

Toothpastes are the most common preventive means in oral health care [1]. Toothpaste comes in many flavors and helps to leave mouth and breath feeling fresh after brushing[2]. It is a dentifrice that is used to keep teeth clean, maintain their health, and improve their appearance. It is primarily used to maintain oral hygiene, but it also functions as an abrasive, helps in removing dental plaque and food particles from the teeth, assists in the removal and/or veiling of halitosis, and release active chemicals like fluoride to help prevent tooth and gum disease. The majority of the cleaning is done by the toothbrush's mechanical action and with the help of excipients included in toothpaste[3-6].

Dental caries is steadily increasing in the underdeveloped and developing country. Chronic gingivitis is one of the most common oral diseases with high prevalence around the world. Dental plaque is the major etiological and initiating factor for the development of gingivitis. The dental plaque is thin film of bacteria that sticks to teeth and yellow colour can't be rinsed off. There is an urgent need to promote traditional preventive measures that are acceptable, easily available and cost effective. However, due to the limitation of mechanical methods, the addition of some safe and effective drugs to prevent gingivitis in toothpaste is also considered to be a good supplementary to the control of mechanical plaque [7].

Herbal and herbal-based toothpaste has been used in ancient life for many years and is one of the most significant aspects of oral health care. In the nineteenth century, modern toothpaste compositions were created. Later on, chalk and soap were incorporated to those formulations. After 1945, several formulation advancements of different detergents had begun; sodium lauryl sulfate had been used as emulsifying agent. In recent years, the focus has shifted towards the release of active ingredients during formulation developments to prevent and /or treat oral illness. The use of plants are very effective as they contain active chemical ingredients such as they contain important secondary metabolites.. These metabolites have also been investigated to have different biological activities. This increases scope for formulating and evaluating new herbal toothpaste [8].

Ideal properties of toothpaste

1. Good abrasive effect
2. Non-irritant, non-toxic and prolonged effect
3. Impart no stain in tooth
4. Keep the mouth fresh and clean
6. Cheap and easily available

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II. MATERIAL AND METHODS

Collection of herbal ingredients

All the herbal ingredients were either collected from nearby locality of New Montfort College of Pharmacy, Ashti Dist. Wardha or procured from local market.

Method of Formulation[9.10]

The solid ingredients calcium carbonate, sodium fluoride. acacia, methyl paraben, sodium benzoate, sodium saccharine were weighed accuratelyas mentioned in the formula and was properly sieved.

Further, these chemicals were subjected to mixing in mortar and pestle and triturated with accurately weighed glycerine until semisolid mass formed.

Addition of herbal ingredients. Accurately weighed herbal powders were sieved and added to the base along with clove oil.

Peppermint oil was added as a flavoring agent at the end.

Composition of Toothpaste

Sr. No.	Ingredient	Quantity	Uses
1.	Guava Leaf Powder	1.8 g	Anticaries, antimicrobial
2.	Fenugreek Powder	3.5 g	Anti-inflammatory
3.	Clove Powder	0.05 g	Dental analgesic
4.	Neem Powder	2.1 g	Antimicrobial
5.	Pomegranate Peel Powder	3.0 g	Antifungal, Anti-inflammatory

Bases

Sr. No	Ingredient	Quantity	Uses
1.	Calcium Carbonate	41 g	Abrasive
2.	Sodium Fluoride	0.9 g	Anticaries
3.	Glycerin	44 g	Humectant Agent
4.	Acacia	1.8 g	Binding Agent
5.	Methyl Paeraben	0.2 g	Preservative
6.	Sodium benzoate	0.1 g	Sweetening Agent
7.	Sodium saccharine	0.2 g	Flavouring Agent
8.	Peppermint oil	q.s	Flavouring Agent
9.	Sodium lauryl sulphate	1 g	Detergent &foaming agent

Evaluation of Formulated Herbal Toothpaste

Physical Examination

The formulated toothpaste was evaluated for its colour, odour taste, smoothness. Visually colour was checked. Odour was found by smelling the product. Taste was checked manually by tasting the formulation The Smoothness was tested by rubbing the paste formulation between the fingers.

pH

pH of formulated herbal toothpaste was determined by using pH meter 10g of toothpaste placed in 150ml of beaker Allow the 10ml of boiled and then cooled water. Stir vigorously to make a suspension

Homogeneity

The toothpaste shall extrude a homogenous mass from the collapsible tube or any suitable container by applying of normal force at 27^0C In addition, bulk of contents shall extrude from the crimp of container and then rolled it gradually. To verify for the presence of any sharp or abrasive particles, the contents were placed on the finger and scratched on the

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butter paper for 15-20cm. I went through the same process at least ten times. There were no sharp or edge abrasive particles discovered.

Foamability

The foamability of formulated toothpaste was evaluated by taking smallamount offormulation with water in measuring cylinder initial volume wasnoted and then shaken for 10 times then final volume of foam was note

Spreadability

In this method slip and drag characteristic of paste involve. Formulated paste (2g)placed on the ground slide under study. The formulated paste placed like sandwich between this slide and uniform film of the paste between slides. Excess of the paste was scrapped off from the edges. The top plate was then subjected to pull of 80g with the help of string attached to the hook and time (sec) required by the top slide to cover a distance of 7.5cm was noted. A short inter vak indicated better spreadability. Formula was used to calculate spreadability.

$$S = M \times L / T$$

Where

S – Spreadability

M - Weight in the pan (tied to the upper slide)

L- Length moved by the glass slide

T - Time (sec) taken to separate the upper slide from the ground slide

III. RESULTS AND DISCUSSION

Physical Examination

Sr. No.	Parameter	Observation
1.	Colour	Greenish
2.	Odour	Characteristic
3.	Characteristic	Characteristic
4.	Smoothness	Smooth
5.	Relativedensity	10.2

Evaluation Parameters

Sr.no.	Parameter	Observation
1.	pH	7.10
2.	Homogenesity	Good
3.	Abrasiveness	Goodabrasive
4.	Foamability	10(Good)
5.	Spreadability	6cm
6.	Stability	Stable

IV. CONCLUSION

Herbal toothpastes have an emphasized role in maintaining the oral hygienic nature as well as preventing dental caries. The formulated polyherbal toothpaste was successfully evaluated using different standard parameters. The formulated toothpaste may be safer compared to total synthetic toothpaste. Further studies are warranted to prove safety and efficacy of the formulated toothpaste.

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