IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 3, October 2024

Development and Assessment of Herbal Toothpastes

Vaishnavi Amle[1], Neha Bambodkar[2], Vaishnavi Dhakulkar[3], Kunika Dhale[4], Saloni Bhoyar[5], Renuka Balpande[6]
Students of Final Year[1-6]
New Montfort Institute of Pharmacy, Ashti, Wardha, Maharashtra, India
dhakulkarvaishnavi7@gmail.com

Abstract: *The fundamental purpose of toothpaste is to preserve dental hygiene. In addition to its abrasive properties, it aids in the elimination of halitosis, helps remove food particles and dental plaque from teeth, and releases compounds like fluoride that combat gum and tooth decay. The current study attempts to create an herbal toothpaste with peels from pomegranates, cloves, fenugreek, and guava leaves. Different concentrations of different substances were used to produce herbal toothpastes, and the optimum formulation was chosen. The toothpastes were assessed using a range of techniques, including foamability, spreadability, and pH. The employed herbs have strong antibacterial properties. This study offers an excellent foundation for future dental research and public dental health.*

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

I. INTRODUCTION

In oral health care, toothbrushes are the most often used preventive measure [1]. Toothpaste is available in a variety of flavors and helps to freshen the breath and mouth after brushing[2]. It is a dentifrice used to preserve the health, cleanliness, and aesthetics of teeth. In addition to its primary purpose of maintaining oral hygiene, it also serves as an abrasive, aids in the removal of food particles and dental plaque from teeth, and releases active compounds like fluoride to help prevent gum and tooth disease. Excipients found in toothpaste and the mechanical action of the toothbrush perform the majority of the cleaning[3-6].

Dental caries is rising gradually in the developing and impoverished nations. One of the most widespread oral conditions with a high global prevalence is chronic gingivitis. The main cause of gingivitis is dental plaque, which also acts as an initiator. Dental plaque is a thin layer of bacteria that clings to teeth and is unwashable due to its yellow color. Promoting conventional preventative interventions that are widely accepted, freely accessible, and reasonably priced is urgently needed. But because mechanical approaches are limited, it is also thought that adding some safe and effective medications to toothpaste to prevent gingivitis is a good addition to controlling plaque mechanically [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

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 3, October 2024

6. Cheap and easily available

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]

1. The solid ingredients calcium carbonate, sodium fluoride. acacia, methyl paraben, sodium benzoate, sodium saccharine were weighed accurately as mentioned in the formula and was properly sieved.
2. Further, these chemicals were subjected to mixing in mortar and pestle and triturated with accurately weighed glycerine until semisolid mass formed.
3. Addition of herbal ingredients. Accurately weighed herbal powders were sieved and added to the base along with clove oil.
4. 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 color, taste, and smoothness of the toothpaste formulation were assessed. Color was examined visually. The product's odor was detected by sniffing it. By manually tasting the formulation, taste was verified. By rubbing the paste formulation between the fingertips, the smoothness was evaluated.

pH

Using a pH meter, the herbal toothpaste's pH was ascertained. Put 10g of toothpaste in a 150ml beaker. Permit the 10ml of water to boil before cooling down. Using a strong whisk, create a suspension.

Uniformity

When exerting normal force at 270°C, the toothpaste must extrude a homogenous mass from the collapsible tube or any other suitable container. Additionally, the majority of the contents must protrude from the container's crimp before being gently rolled.The contents were put on the finger and scraped on the butter paper for 15 to 20 centimeters to

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 3, October 2024

check for any sharp or abrasive particles. I must have gone through this procedure ten times over. No sharp or edge-abrasive particles were found.

Foamability

The foamability of formulated toothpaste was evaluated by taking smallamount of formulation 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 are particularly important for keeping teeth cavities at bay and preserving oral hygiene. Several standard parameters were successfully used to evaluate the polyherbal toothpaste formulation. When compared to completely synthetic toothpaste, the designed toothpaste might be safer. To demonstrate the toothpaste's safety and effectiveness, more research is necessary.

REFERENCES

[1]. 1 Rathi NM, Sirsat SV. Toshniwal SS, Zagare NT, Mahamad SFS Formulation and evaluation study on herbal toothpaste A Review International research of novel research and development 2022, 7(4) 968-974

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 3, October 2024

[2]. 2. Malgi R, Mane DV, Kumar DN, Paramshetty V, Kobanna S. Formulation and evaluation of herbal tooth paste by Cajanus cajan (L.) Leaf extract .Journal of Pharmacognosy and Phytochemistry 2022; 11(1): 175-178

[3]. 3.Senthilkumar KL, Venkateswaran S, Vasanthan A, Chiranjeevi P. Formulation development and evaluation of novel herbal toothpaste from natural source. Internationaljournal of pharmaceutical chemistry and analysis 2022; 9(1) 17-21

[4]. Neman RK, Ks R, Dubai BK. Textbook of Cosmetics; 2009.

[5]. Mantilla T. Ravi Kumar M. Preparation and Evaluation of Herbal Toothpaste and Compared with Commercial Herbal Toothpastes: An In-vitro Study. Into J Ayurvedic Herbal Med. 2016; 5(10):2266-51.

[6]. Dange VN, Magdum CS, Mohite SK, Nitlikar M. Review on Oral Care Product: formulation of toothpaste from various and extracts of tender twigs of neem. J of Pharm Res. 2008; 1(2):148-52.

[7]. Mali SA, Malik SM, Mane AA, Mane PD, Mangnale SM, Swami KB. Formulation and Evaluation of Herbal Toothpaste: Remedy for oral cancer .International Journal of Pharmaceutical Research and Applications. 2022; 7(5): 1380-1386

[8]. Gautam D. Palkar P. Maule K, Singh S, Sawant G, Kuvalekar C, Rukarı T. Jagtap VA. Preparation, evaluation and comparision of herbal toothpaste with marketed herbal toothpaste. Asian journal of pharmacy and technology 2020; 10(3) 165-169

[9]. Mithal BM and Saha RN. A Handbook of Csmetics. Vallabh prakashan, Delhi. 2016; 1st Ed. pp. 204-212.

[10]. Lieberman HA, Rieger MM and Banker GS. Pharmaceutical Dosage Forms: Disperse Systems. Volume 2, Informa Healthcare. 2008; 2nd Ed. pp. 423-445.

[11]. Adeleye OA, Bamiro O. Akpotu M, Adebowale M, Daodu J, Sodeinde MA. Physicochemical Evaluation and Antibacterial Activity of *Massularia acuminata* Herbal Toothpaste. Turkish Journal of Pharmaceutical Sciences. 2021; 18(4): 1-5