



Formulation and Evaluation of Poly Herbal Tooth Paste

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Oral hygiene can be maintained throughout the day by using various dentifrices prepared with herbal and synthetic ingredients. Oral hygiene is maintained to keep the mouth fresh and avoid tooth decay. The largest producer of healthful herbs is India which is known as the botanical garden of the world. The main aim of this work is to formulate and evaluate polyherbal toothpaste and compare it with marketed products of the same category. The toothpaste was prepared by using several herbal ingredients which show antibacterial, antiseptic, and cooling properties. Neem, clove, babool, banyan, amla, and many other natural products are used to formulate ideal herbal toothpaste which satisfies all the required properties to keep the mouth fresh and to prevent tooth decay caused by the bacteria. The method which is used for formulating the herbal toothpaste is the trituration method. The prepared toothpaste was evaluated for its organoleptic and physical characteristics such as color, odor, taste, stability, foamability caused by bacteria, and abrasiveness to ensure that it possesses all the desired features to use against dental disease. Thus, the formulated herbal toothpaste was a good herbal toothpaste than the conventional toothpaste due to its side effect.

Keywords: Poly herbal; toothpaste; formulation.

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1. INTRODUCTION

A paste or gel dentifrice which is used to clean and maintain aesthetics and health of teeth with the help of a toothbrush is called toothpaste [1,2,3,4,5]. It is said to be dentifrice that is in the form of smooth semisolid homogeneous mass containing surfactant, binders, polishing agent, humectants, abrasives, and other appropriate materials to maintain oral health [6,7,8,9] "GOOD APPEARANCE AND IMPRESSION" which gives confidence to an individual is an important key to maintain oral hygiene [10,11,12]. Nowadays people are more inclined towards the use of non-alcoholic and herbal formulation because it does not contain artificial color, flavor, or fluorides as it has several drawbacks [13,14,15]. In ancient days various regions of the world used powdered ashes, eggshells, myrrh, crushed ostrich, crab shell, bones, and the horn of various animals [16,17,18]. During that period they attained good abrasives action with their formulated tooth powder which was further converted into toothpaste [19,20,21]. Proper oral hygiene should be maintained otherwise it will cause several dental problems like cavities, tooth sensitivity, calculus, and periodontal disease [22,23,24]. Herbal toothpaste is referred to as an oral hygienic product to maintain the health of teeth [25,26].



Fig. 1. Herbal ingredients used for healthy teeth

Mostly it contains plant products or its derivatives which it mean for the protection of teeth and is used in strengthening the teeth without causing any harmful effects [27,28]. Natural or herbal toothpaste lack triclosan or fluorides and other artificial chemical ingredients which overcome the side effects like carcinogenic action as it mostly contains plant-based ingredients such as lemon, eucalyptus, rosemary, chamomile sage, and myrrh [29,30].

2. MATERIALS AND METHODS

A method used for the formulation of herbal toothpaste is homogenization by using mortar and pestle for the formation base of toothpaste.

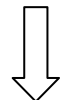
All the required materials for making the herbal toothpaste were collected [31,32].



Each ingredient was dried completely and powdered [33,34].



The powdered herbal ingredient was weighed accurately as per the need [35,36].



The ingredients were mixed with chemicals such as polyethylene glycol is used as humectant and a solvent to form a base for the preparation [37,38].



The herbal powder and the base ingredients were added to the mortar and pestle, and stevia powder was added as a sweetening agent [39,40].



The herbal ingredients are triturated well until a paste consistency is formed [41,42].

2.1 Formulation

An equal proportion of all the ingredients (Neem, Babool, Guava leaf, Banyan, Clove, Betel Nut, Amla, Cardamon, and Stevia) were dried and converted into powder [43,44].

Along with the herbal powder add a sufficient quantity of Polyethylene glycol, water, and sodium lauryl sulfate and mixed well to get the herbal toothpaste [45,46].

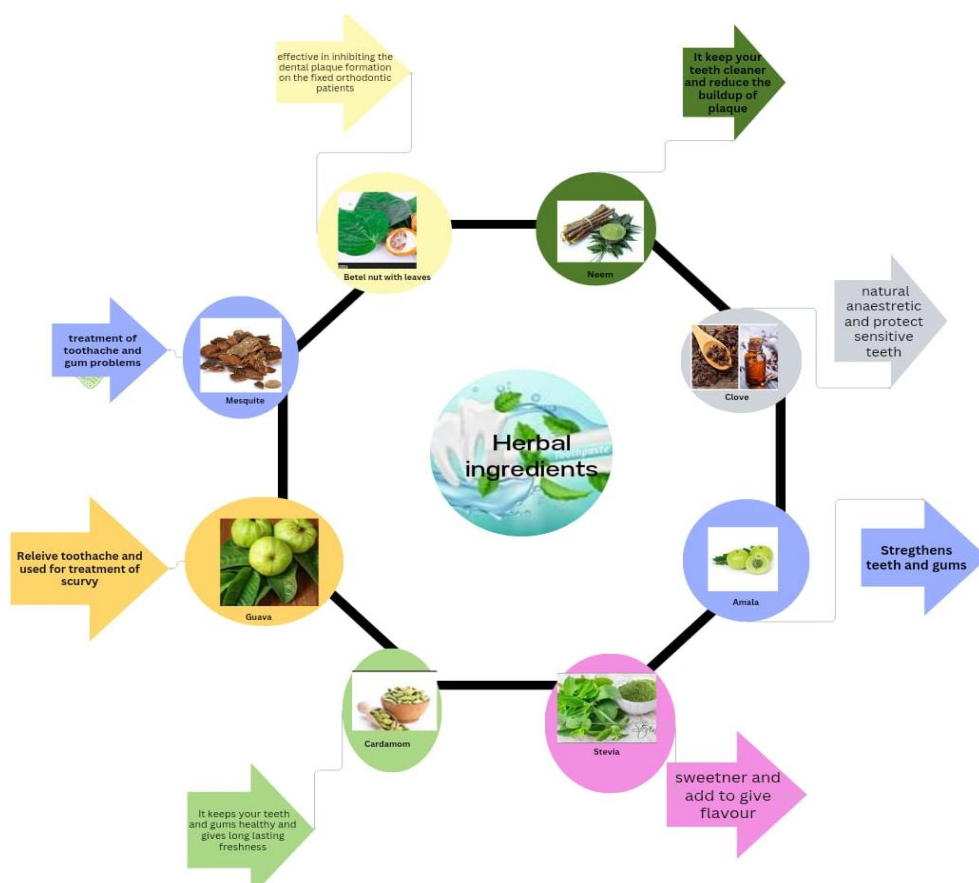


Fig. 2. Formulation of herbal toothpaste

3. RESULTS AND DISCUSSION

The sensory evaluation parameters of herbal toothpaste is evaluated their color, odour, taste and observe dark brownish, heavy aromatic, spicy, bitter, and subtly sweet is described in the below (Table 1).

Table 1. Sensory evaluation parameters (Color, odor, taste)

Sl. No	Parameters	Observation
1.	Color	Dark Brownish
2.	Odor	Heavy Aromatic
3.	Taste	Spicy, Bitter, and subtly sweet

3.1 Comparative Study

3.1.1 Formulated herbal toothpaste with marketed formulation (Colgate vedshakthi)

The formulated herbal toothpaste was compared with the marketed preparation for its color, taste, odor, consistency, smoothness, abrasiveness, moisture content, foaming test, fineness test, stability, PH determination, spreadability, and homogeneity.

The consistency, smoothness, and abrasiveness is evaluated and observed and described in the below (Table 2).

Table 2. Sensory evaluation parameters (Consistency, Smoothness, Abrasiveness)

SI. No	Parameters	Observation
1.	Consistency	Good
2.	Smoothness	Moderate Smooth
3.	Abrasiveness	Good Abarasive

The evaluation test of Ph, Foamability, Moisture content, spreadability, Homogeneity, Stability is observed and described in the below (Table 3).

Table 3. Sensory evaluation parameters (PH, Foamability, Moisture Content, Spreadability, Homogeneity, Stability)

SI.no	Parameters	Observation
1.	PH	7.09
2.	Foamability	60(100%)
3.	Moisture Content	34.8 %
4.	Spreadability	5.8 cm/sec (good)
5.	Homogeneity	Good
6.	Stability	Stable

3.2 Physical Examination

The physical examination of the formulation of herbal toothpaste is compared with marketed formulation and is described in the below (Table 4), (Table 5) and (Table 6).

Table 4. Physical examination of formulation 1

SI.No	Parameters	Formulation	Marketed Formulation
1.	Color	Dark brown	Light Brown
2.	Odor	Heavy aromatic	Aromatic
3.	Taste	Spicy, bitter, and subtly sweet	Sweet
4.	Consistency	Good	Good

Table 5. Physical examination of formulation 2

SI. No	Parameters	Formulation	Marketed Formulation
1.	PH	7.09	9.44
2.	Good Abrasive	Good Abrasive	Moderate abrasive
3.	Homogeneity	Good	Good
4.	Smoothness	Moderate Smooth	Very smooth

3.3 Physiochemical Evaluation

Table 6. Physiochemical evaluation of parameters

SI. No	Parameters	Formulation	Marketed Formulation
1.	Foaming test	60 (100%)	70 (100%)
2.	Fineness	Moderate Good	Good
3.	Moisture Content	20.65%	12.76%
4.	Spreadability	5.8	5
5.	Stability	Stable	Stable

4. CONCLUSION

All the marketed herbal and natural toothpaste are not completely herbs, that contain certain

chemical compounds to prevent bad breath and whiten the teeth [47,48]. But, here the formulated herbal toothpaste contains various effective herbs that can be used for total dental and oral

care, without causing any side effects. Evaluation tests for formulated herbal toothpaste were carried out according to the standard specified by the Bureau of Indians [49]. Both sample was founded to be of good quality and have physicochemical properties. It is free from harmful and is economical with good quality [50].

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Mahendran Sekar et al. Formulation and evaluation and antimicrobial properties of novel polyherbal toothpaste for oral care; 2016.
2. Simanchal Panda et al. Preparation and evaluation of caffeinated toothpaste with Thyme essence; 2018.
3. Fatima Grace et al. Preparation and evaluation of herbal dentifrice; 2015.
4. Sangaram keshari panta et,al. Formulation and evaluation of the herbal toothpaste and comparison with different market preparation; 2020.
5. Bhagyasri Y et al. Pharmaceutical and biological evaluation of polyherbal toothpaste; 2017.
6. Sethiya Saloni et al. Preparation, and evaluation of herbal toothpaste; 2016.
7. Vasu Naik V et al. Harshodent – Innovative herbal toothpaste; 2016.
8. JOkpalugo et al. Toothpaste formulation efficacy in reducing oral flora; 2017.
9. Robin Davies et al. Dentifrices – an update; 2010.
10. Olutaya Ademola Adeleye et al., Physiochemical evaluation and antibacterial activity of malaria acuminate herbal toothpaste; 2020.
11. Wakanma CN et al. The effect of selected toothpaste and microbial fluoro of the mouth of your student; 2014.
12. Mamatha D et al. Preparation evaluation and comparison of herbal toothpaste with marketing available; 2017.
13. xxx@stetsonhillsdentist.com
14. Ramishetty Sabitha Devi et.al. Roles of herbs and their uses in dentistry; 2013.
15. Pavan Deshmukh et.al. Formulation, and evaluation of herbal toothpaste compared with marketed preparation; 2017
16. Tara Renton et al. Tooth-related pain or not; 2020.
17. watts A, Addy M et al. Tooth discoloration and staining a review; 2001.
18. Mohemmed Kinani et al. Formulation and phytochemical evaluation of toothpaste formulated with *Thymus vulgaris* essential oil; 2017.
19. Ozgu can karadaglioglu et al. Antibacterial activities of herbal toothpaste combined with essential oil against streptococcus mutant; 2019.
20. Bhargavi Prabhuswamy et al. comparative evaluation of the anticarcinogenic activity of commercially available herbal dentifrices; 2018.
21. Megalaa N et al. Role of herbal leaf extracts in caries prevention; 2014.
22. Olugbenga Oludayo Oluwasina et al. Anti-microbial potential of toothpaste formulated from extracts of syzgium aromatic, Denntetia, Tripetala, and jatropaha latex against some oral pathogenic microorganisms; 2019.
23. Davari AR et.al. Dentine hypersensitivity; etiology diagnosis and treatment; literature review; 2013.
24. Birgitta Soder et al. Dental calculus is associated with death from heart infractions; 2013.
25. Kuldeep Singh et al. Comparative studies between herbal toothpaste(dantkanti) and non-herbal toothpaste; 2016.
26. Bhushan S kala et al. Treatment of periodontal disease-A herbal approach; 2015.
27. Abhishek KN et al. Effect of neem containing toothpaste on plaque and gingivitis- A randomized double-blind clinical trials; 2015.
28. Philip D Marsh et al. Dental plaque as a biofilm and a microbial community-implications for health and disease; 2006.
29. Vini menta et al. Efficacy of herbal dentifrice on the prevention of plaque and gingivitis as compared to conventional dentifrice; A systematic review and meta-analysis.

30. Porter SR, Scully C et al. Oral malodor halitosis; 2006.
31. Jennifer Archibald DDS Dec 7 2020 Bad breath (Halitosis) written by Healthline editorial team.
32. Emanuela Beanina Machado Costa et al. Role, and influence of the toothpaste components in the oral biochemistry; 2011.
33. Joel Ogbuji et al. Formulation, physiochemical evaluation and antimicrobial activity of green toothpaste on streptococcus mutans; 2018.
34. Aravind Tationda et al. Effects of herbal and non-herbal toothpaste on plaque and gingivitis; A clinical comparative study; 2018.
35. Srinivas R Myneni, BDS, Ph.D. Effects of baking soda in dentifrices on plaque removal; 2017.
36. Akotakar AM et al. Formulation and comparative standardization of toothpaste; 2018.
37. Timothy J Lafolla. Effectiveness of herbal oral care products in reducing dental plaque and gingivitis-A systematic review and meta-analysis; 2020.
38. Suraj Mauyra et al. Formulation of clove toothpaste; 2021.
39. Urmila Nishad et al. Formulation, and evaluation of polyherbal toothpaste using medicinal plants.
40. Feroz Jenner et al. Evaluating the anti-microbial activity of commercially available herbal toothpaste on microorganisms associated with diabetes mellitus; 2013.
41. Shivprasad et al. An approach of formulation and evaluation of herbal toothpaste by comparison with commercial toothpaste; 2018.
42. Abhay et al. Formulation and evaluation of new poly herbal toothpaste for oral care; 2015.
43. Hemant Kadway et al. Herbal toothpaste market to witness massive growth by 2025-The Himalaya drug colgate - palmolive, labor; 2020.
44. Satabai Bhattacharjee et al. Efficacy of toothpaste on bacteria isolated from the oral cavity; 2018.
45. Gaurav Balu Dafal et al. Formulation and Evaluation of toothpaste by using eggshell; 2017.
46. Pallavi L Phalke et al. Formulation and evaluation of toothpaste containing a combination of aloe and sodium chloride; 2019.
47. Judge DR et al. Formulation of toothpaste From various forms and extracts of tender twigs of neem; 2008.
48. Siddharth Sharma et al. Formulation development and quality evaluation of polyherbal toothpaste "Oral S"; 2014.
49. Mangila T et al. Preparation and evaluation of herbal toothpaste and compared with commercial herbal toothpaste: An invitation study; 2016.
50. Abubakar EL-Ishaq et al. The role of various toothpaste in the reduction of bacteria load in the mouth; 2015.

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