World Journal of Pharmaceutical Science and Research

www.wjpsronline.com

Research Article

ISSN: 2583-6579
SJIF Impact Factor: 5.111
Year - 2026
Volume: 5; Issue: 1
Page: 81-87

FORMULATION AND EVALUTION OF ALLOPHATIC TOOTHPASTE

Saurabh Hanumant Dhaygude*[1], Prachi Nandkumar Padwal[2], Prof. Shital Gaikwad[3], Reema Chandrakant Londhe[4], Parth Dnyaneshwar Dathkil[5]

[1,5]Student, Samarth Institute of Pharmacy, Belhe, Pune, Maharashtra, India.

[2]Assistant Professor, Department of Quality Assurance Technique, Samarth Institute of Pharmacy, Belhe, Pune, Maharashtra, India.

[3]Assistant Professor, Department of chemistry, Samarth Institute of Pharmacy, Belhe.

[4]Assistant Professor, Department of Pharmaceutical Quality Assurance Technique, Samarth Institute of Pharmacy, Belhe.

Article Received: 6 November 2025 | | ***Article Revised: 27 November 2025*** | | ***Article Accepted: 17 December 2025***

***Corresponding Author: Saurabh Hanumant Dhaygude**
Student, Samarth Institute of Pharmacy, Belhe, Pune, Maharashtra, India.
DOI: https://doi.org/10.5281/zenodo.18108607

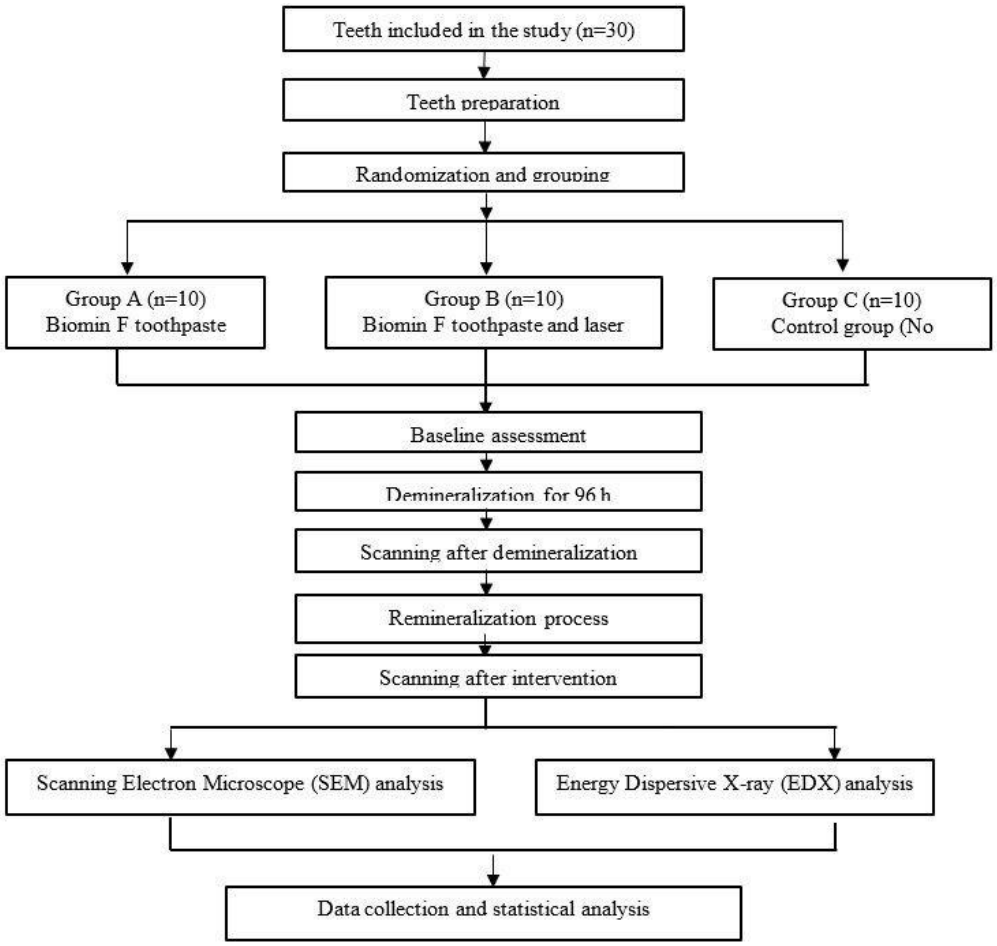
How to cite this Article: Saurabh Hanumant Dhaygude, Prachi Nandkumar Padwal, Prof. Shital Gaikwad, Reema Chandrakant Londhe, Parth Dnyaneshwar Dathkil (2026) FORMULATION AND EVALUTION OF ALLOPHATIC TOOTHPASTE. World Journal of Pharmaceutical Science and Research, 5(1), 81-87. https://doi.org/10.5281/zenodo.18108607

Copyright © 2026 Saurabh Hanumant Dhaygude | World Journal of Pharmaceutical Science and Research.
This work is licensed under creative Commons Attribution-NonCommercial 4.0 International license (CC BY-NC 4.0).

ABSTRACT

Allopathic toothpaste is a scientifically formulated dental preparation designed to maintain oral hygiene and prevent common dental problems such as caries, gingivitis, plaque, and halitosis. It contains active pharmaceutical ingredients such as fluoride, trichinosis, and antiseptic agents that provide therapeutic benefits beyond basic cleaning. The formulation typically includes abrasives for plaque removal, humectant s to retain moisture, binding agents for consistency, and flavouring agents for consumer acceptability. The allopathic approach focuses on evidence-based and pharmacologically active ingredients that act through antimicrobial, anti-inflammatory, and remineralizing mechanisms. Regular use of allopathic toothpaste ensures effective oral care, reduces bacterial load, strengthens enamel, and promotes overall dental health. The formulation represents a balanced combination of modern medicine and oral hygiene science aimed at preventive as well as therapeutic dental care.

KEYWORDS: Allopathic Toothpaste, Oral Hygiene, Fluoride Protection, Antimicrobial Action, Plaque & Cavity Prevention, Gingivitis Control, Enamel Strengthening, Therapeutic Dental Care, Modern Formulation, Fresh Breath.



INTRODUCTION

Allopathic toothpaste is a scientifically formulated dental care product designed using modern medical and pharmaceutical principles. It typically contains active chemical ingredients that help prevent dental problems such as cavities, plaque formation, gum infections, and bad breath. Unlike herbal or ayurvedic toothpastes, allopathic toothpastes rely on clinically tested compounds—such as fluoride, triclosan, and antiseptic agents—to ensure effective oral hygiene and protection against harmful microorganisms. Regular use of allopathic toothpaste helps maintain strong teeth, healthy gums, and overall oral health by combining therapeutic and preventive actions

Ideal Characteristics of allopathic mouthwash

1. Prevents Tooth Decay.
2. Removes Plaque and Tartar.
3. Fights Germs and Bacteria.
4. Maintains Oral Hygiene.
5. Reduces Gum Problems.
6. Whitens Teeth.
7. Provides Fresh Breath.
8. Relieves Tooth Sensitivity.
9. Convenient and Readily Available.

Benefits of allopathic mouthwash

1. Reduces Oral Microbial Load
2. Prevents Plaque Formation and Gingivitis
3. Provides Fresh Breath
4. Aids in the Prevention of Dental Caries
5. Promotes Healing After Dental Procedures
6. Maintains Oral Hygiene in Hard-to-Reach Areas
7. Provides Symptomatic Relief
8. Convenient and Easy to Use. It is safe to use.

Advantages of Allopathic Mouthhwash

1. Scientifically Proven Formula.
2. Strong Antibacterial Action.
3. Helps kill harmful bacteria, reducing the risk of infections and bad breath.
4. Prevention of Dental Problems.
5. Protects against cavities, plaque, tartar, and gum diseases.
6. Strengthens Tooth Enamel.
7. Quick and Effective Results.
8. Maintains Oral Freshness.
9. Easily Available and Affordable.
10. Aesthetic Benefits.

INGREDENT LIST

MATERIAL	QUANTITY	PROPERTIES
Distilled water	4.5g	Solvent
Gum tragacanth	1.07g	Natural binder
Sodium lauryl sulphate	1.33g	Foaming agent
Methyl paraben	0.036g	Preservative
Calcium carbonate	10.66g	Abrasive
Titanium dioxide	0.53g	Opacifier
Menthol	0.11g	Cooling agent
Clove oil	0.80ml	Essential oil
Ethanol	Few drops	Antimicrobial properties

Method of preparation

1. **Preparation of Ingredients:** All raw materials such as abrasives, humectants, binders, surfactants, preservatives, flavouring agents, and therapeutic ingredients are accurately weighed according to the formula.
2. **Mixing of Liquids:** Humectants like glycerine, sorbitol, and propylene glycol are mixed with purified water to form a uniform base solution.
3. **Addition of Binders:** Binders (such as sodium carboxymethyl cellulose or gum tragacanth) are dispersed into the liquid mixture to achieve the desired consistency and prevent separation of ingredients.
4. **Incorporation of Abrasives:** Abrasive agents (like calcium carbonate, dicalcium phosphate, or silica) are gradually added under constant stirring to form a smooth paste.

5. **Addition of Surfactants and Active Agents:** Surfactants such as sodium lauryl sulphate are added to produce foaming, followed by the incorporation of active therapeutic ingredients (like fluoride, triclosan, or antiseptic agents).
6. **Flavouring and Sweetening:** Flavouring agents (menthol, peppermint oil) and sweeteners (saccharin sodium) are mixed in to enhance taste and user acceptability.
7. **Homogenization:** The mixture is thoroughly homogenized to achieve a uniform, smooth, and glossy paste texture.
8. **Filling and Packaging:** The finished toothpaste is filled into collapsible tubes or laminated tubes using automatic filling machines, sealed, labelled, and packed for distribution.

Apparatus Required

1. Electronic Weighing Balance – for accurately measuring all ingredients.
2. Beakers and Measuring Cylinders – for preparing and mixing liquid components.
3. Glass Rods / Mechanical Stirrer – for uniform mixing and stirring of ingredients.
4. Mortar and Pestle – for grinding and blending solid ingredients smoothly.
5. Homogenizer / Planetary Mixer – for obtaining a uniform and consistent paste.
6. Heating Mantle or Water Bath – for dissolving certain ingredients if needed.
7. Spatula and Scraper – for transferring and handling the paste.
8. Collapsible Tube Filling Machine – for filling the final product into tubes.
9. pH Meter – for checking and adjusting the pH of the formulation.
10. Viscometer – for measuring the viscosity and consistency of the toothpaste.

*Storage Containers – for temporary storage of prepared batches

Procedure

1. **Weighing of Ingredients:** Accurately weigh all required ingredients such as abrasives, humectants, binders, surfactants, flavouring agents, sweeteners, and active ingredients.
2. **Preparation of the Base:** Mix humectants (like glycerine or sorbitol) with purified water in a beaker to form a smooth base solution.

3. **Addition of Binder:** Slowly add the binder (e.g., sodium carboxymethyl cellulose) into the base under continuous stirring to form a uniform gel.
4. **Incorporation of Abrasives:** Gradually add abrasive materials (such as calcium carbonate or silica) into the gel while stirring until a smooth paste is formed.
5. **Addition of Surfactant and Active Agents:** Add surfactants (like sodium lauryl sulphate) to provide foaming properties. Then incorporate active agents such as fluoride, triclosan, or antiseptics for therapeutic benefits.
6. **Flavouring and Sweetening:** Add flavouring agents (peppermint oil, menthol) and sweeteners (sodium saccharin) to improve the taste and acceptability of the toothpaste.
7. **Homogenization:** Thoroughly mix the entire formulation using a homogenizer or mixer to achieve a smooth, glossy, and uniform consistency.
8. **Evaluation:** Check the pH, viscosity, and appearance of the final toothpaste. Adjust if necessary.
9. **Filling and Packaging:** Transfer the prepared toothpaste into collapsible or laminated tubes using a filling machine.

Seal, label, and store in a cool, dry place for further use.
Label the container properly.

Evaluation Parameter

1. **Appearance and Colour:** The toothpaste should have a smooth, uniform appearance with an appealing colour and no visible lumps or air bubbles.
2. **Odor and Taste:** Should have a pleasant Odor and acceptable taste, usually minty or fresh.
3. **pH Measurement:** The pH should be near neutral (between 6.5–8.0) to prevent irritation and enamel erosion.
4. **Spread ability:** Determines how easily the toothpaste spreads on the toothbrush and teeth. A good toothpaste should spread smoothly without being too thick or runny.
5. **Foaming Ability:** Measured by the volume of foam produced after brushing or agitation in water Indicates cleaning efficiency and surfactant quality.
6. **Abrasiveness:** The abrasive strength should be sufficient to remove stains and plaque without damaging enamel.

7. **Consistency and Viscosity:** Checked using a viscometer to ensure the paste is neither too hard nor too soft.
8. **Homogeneity:** The formulation should be uniform throughout, with no separation of solid and liquid phases.
9. **Stability Test:** The toothpaste should remain stable (no colour change, Odor change, or phase separation) during storage under different conditions.
10. **Determination of Moisture Content:** Ensures the toothpaste has an optimal water content to prevent microbial growth or drying out.
11. **Cleaning Efficiency:** Evaluated by assessing stain removal and plaque reduction after brushing.
12. **Tube Extrudability:** Measures how easily the paste can be squeezed out from the tube, indicating good packaging performance.

RESULTS AND DISCUSSION

The prepared allopathic toothpaste was found to be smooth, uniform, and free from lumps or air bubbles. It showed a pleasant Odor and taste with good foaming ability. The pH of the formulation was found to be within the acceptable range of 6.5–7.5, ensuring compatibility with oral tissues. The paste exhibited good spread ability, consistency, and stability with no phase separation during the observation period. The toothpaste was easily extrudable from the tube and showed effective cleaning action during testing.

DISCUSSION

The formulation met all the desired parameters of an ideal allopathic toothpaste. The abrasive agents provided effective cleaning without damaging enamel, while fluoride and other active ingredients offered protection against dental caries and microbial growth. The binder and humectant maintained a smooth texture and prevented drying or hardening of the paste. The surfactant contributed to adequate foaming and improved the cleaning effect. The flavouring and sweetening agents enhanced the overall acceptability of the product. The stability studies indicated that the formulation remained unchanged in colour, Odor, and consistency, confirming its shelf stability.

Overall, the prepared allopathic toothpaste showed satisfactory physical and chemical properties, making it suitable for effective and safe oral hygiene.

CONCLUSION

The formulated allopathic toothpaste was successfully prepared using standard pharmaceutical procedures and evaluated for various quality parameters. The product exhibited desirable properties such as smooth texture, pleasant taste, good foaming ability, proper pH, and effective cleaning action. All evaluation results were within acceptable limits, indicating a stable and safe formulation.

Thus, it can be concluded that the prepared allopathic toothpaste is effective for maintaining oral hygiene, preventing dental problems, and providing a refreshing mouthfeel. The study demonstrates that scientifically formulated allopathic toothpaste can offer both therapeutic and cosmetic benefits for daily dental care.

ACKNOWLEDGEMENT

I would like to express my heartfelt gratitude to my respected teacher/guide for their valuable guidance, encouragement, and continuous support throughout the completion of this project on Allopathic Toothpaste. Their expert advice and motivation helped me understand the formulation and evaluation process in depth.

I am also thankful to the laboratory staff for providing the necessary facilities, materials, and technical assistance during the practical work.

Lastly, I extend my sincere thanks to my friends and classmates for their cooperation, suggestions, and encouragement during the preparation of this project.

REFERENCES

1. Effect of Biomin F Toothpaste and Diode Laser on Remineralization of White Spot Lesions (In Vitro Study) - Scientific Figure on ResearchGate. Available from: https://www.researchgate.net/figure/Flow-chart-showing-procedure-that-has-been-done_fig1_378808051 [accessed 18 Dec 2025]
2. Lachman L., Lieberman H.A., Kenig J.L., The Theory and Practice of Industrial Pharmacy, 3rd Edition, Lea & Febiger, Philadelphia, 1986.
3. Remington, The Science and Practice of Pharmacy, 21st Edition, Lippincott Williams & Wilkins, 2005.
4. Indian Pharmacopoeia, Government of India, Ministry of Health and Family Welfare, 2022.
5. Bhatia S.C., Formulary of Cosmetic Preparations, CBS Publishers & Distributors, New Delhi, 2012.
6. Poucher W.A., Poucher's Perfumes, Cosmetics and Soaps, 10th Edition, Springer, 2000.
7. Gupta A.K., Pharmaceutical Technology: Cosmetics and Toiletries Preparation, 1st Edition, CBS Publishers, 2016.
8. *https://www.who.int/oral-health
9. *https://www.fda.gov/cosmetics
10. Highlights antimicrobial testing and stability aspects of mouthwash preparations.