International Journal of Pharmacy and Pharmaceutical Research (IJPPR)
Volume 31, Issue 12, December 2025 **ijppr.humanjournals.com** ISSN: 2349-7203

A Comprehensive Review on Formulation and Evaluation of Herbal Guava Leaf Mouthwash

Ms. Kanchan S. Gore*[1], Mr. Pramod P. Mapari[2], Dr. Sunil S. Jaybhaye[3]

Institute of Pharmacy, Badnapur, Jalna 431202 India
Dr. Babasaheb Ambedkar Technological University, Lonere, Raigad MS India

Received: 09 November 2025 Revised: 25 November 2025 Accepted: 10 December 2025

ABSTRACT:

Mouthwash is a liquid accessory to clean and maintain the health of our teeth for oral hygiene. Several herbal mouthwash and herbal extracts have been tested in vitro and in vivo in search of suitable adjunct to mechanical therapy for long term use. In this study, we aimed to look at the antimicrobial effect of herbal mouthwash on selected microorganisms. The main purposes of using mouthwashes are it can be used at home as routine to maintain good oral hygiene, mouthwash provides anti-inflammatory, anti-microbial activity, itis used prior to and after oral surgery procedures such as tooth extraction as prophylaxis, the purpose of mouthwash after brushing is to clean. Natural herbs such as guava, neem and tulsi and many others are used as single or in combination have been scientifically proven to be safe and effective medicine against oral health problems such as bleeding gums, halitosis, mouth ulcers, and preventing tooth decay without side. The anti-inflammatory and anti-infectious properties of tulsi make it a powerful treatment for gum disease. Chewing of tulsi leaves helps clear ulcers and infections of the mouth. As in mouthwash, Psidium guajava extract is useful against bad breath and for maintaining healthy gums. (1)

Keyword : Guava leaves, Mouthwash, Oral problem, Psidium guajava, Formulation

INTRODUCATION

Guava, also known as Psidium guajava, is packed with important nutrients. Originally from South Africa, it was brought to India by the Portuguese. Guava leaves are commonly used in Asian countries and are prized in Western countries for their medicinal benefits. Guava trees are small in size. Guava belongs to the Myrtaceae family and thrives in tropical or subtropical climates. India is the top guava producer, followed by China. Guava leaves are typically 3 to 4 inches long [2]. Almost every part of the guava plant has medicinal qualities, making it popular in the Philippines and approved by the Department of Health as a medicinal plant. Guava is a small tree that can reach up to 3 meters in height. Its fruit, bark, and leaves are used for herbal medicine. A decoction of guava leaves is known for treating chronic diarrhea and gastroenteritis. It's also used to clean wounds and for vaginal and uterine issues. Guava leaf decoction can be used as a mouthwash too. Guava has been used to manage toothaches, sore throats, and inflamed gums.

decoction of guava leaves is known for Treating chronic diarrhea and gastroenteritis. It’s also Used to clean wounds and for vaginal and uterine issues. Guava leaf decoction can be used as a mouthwash. Guava has been used to manage toothaches, sore throats, And inflamed gums. The oral cavity addresses the initial segment of the stomach-related tube. Its essential capability is to act as the entry of the nutritious lot and to start the stomach related process by salivation and impetus of the wholesome bolus into the pharynx. It likewise fills in as an optional respiratory conductor, a site of sound changes for the development of discourse, and a chemosensory organ. The versatility of the lips is likewise basic to discourse creation, whistling, singing, the playing of wind and metal instruments, expectoration, and human social correspondence (eg, kissing, grinning, moping, uncovering of teeth). Even minor disturbances in the capability of the oral hole can genuinely endanger the singular nature of life. The oral depression is oval formed and is isolated into the oral vestibule and the oral cavity proper. It is limited by the lips anteriorly, the cheeks along the side, the floor of the mouth poorly, the oropharynx posteriorly, and the sense of taste superiorly. The oropharynx starts superiorly at the intersection between the hard sense of taste also, the delicate sense of taste, and poorly behind the circumvallate papillae of the tongue. The hard base of the oral hole is addressed by the maxillary and mandibular bones.(2)

International Journal of Pharmacy and Pharmaceutical Research (IJPPR)
Volume 31, Issue 12, December 2025 ijppr.humanjournals.com ISSN: 2349-7203

MOUTH (ORAL CAVITY)

Our mouth is part of your digestive and respiratory systems. It helps you with daily functions like eating, speaking, and breathing. Taking care of your mouth can keep you healthy and reduce your risk for a wide range of dental and medical conditions.[3]

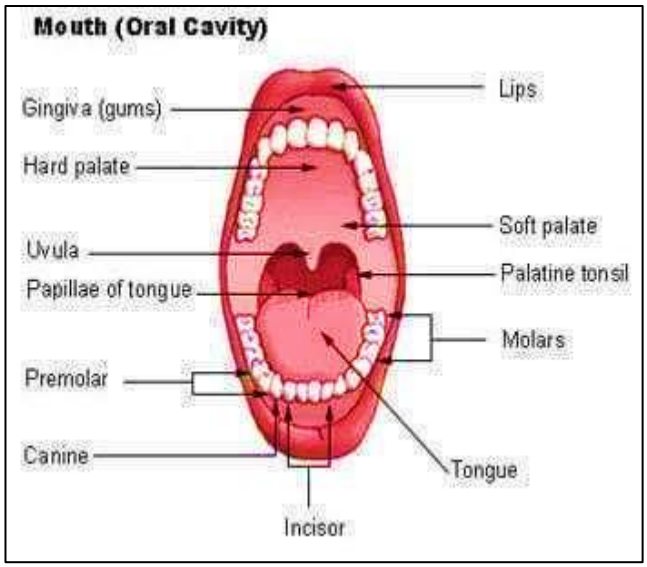

FIG NO 1

ANATOMY OF ORAL CAVITY

The oral cavity addresses the initial segment of the stomach related tube. Its essential capability is to act as the entry of the nutritious lot and to start the stomach related process by salivation and impetus of the wholesome bolus into the pharynx. It likewise fills in as an optional respiratory conductor, a site of sound change for the development of discourse, and a chemosensory organ. The versatility of the lips is likewise basic to discourse creation, whistling, singing, the playing of wind and metal instruments, expectoration, and human social correspondence (eg, kissing, grinning, moping, uncovering of teeth).

Even minor disturbances in the capability of the oral hole can genuinely endanger a singular's nature of life. The oral depression is oval formed and is isolated into the oral vestibule and the oral cavity proper. It is limited by the lips anteriorly, the cheeks along the side, the floor of the mouth poorly, the oropharynx posteriorly, and the sense of taste superiorly. The oropharynx starts superiorly at the intersection between the hard sense of taste also, the delicate sense of taste, and poorly behind the circumvallate papillae of the tongue. The hard base of the oral hole is addressed by the maxillary and mandibular bones. The oral cavity incorporates the lips, gingivae, retromolar trigone, teeth, hard sense of taste, cheek mucosa, portable tongue and floor of the mouth. The major salivary organs are in close connection with oral cavity structures, in spite of the fact that they are not part of the oral cavity. The tongue is important for the oral cavity. The oropharynx includes the palatine tonsils, soft palate, tongue base, and posterior pharyngeal walls; The oral cavity does not include the Oropharaxy.

STATEMENT OF PROBLEM AND HYPOTHESIS

S The increasing awareness of health and harmful effects of synthetic chemicals in daily oral care products. Commercial mouthwashes often contain synthetic chemicals that can cause oral irritation and health issues. The hypothesis is that an herbal mouthwash made from guava leaves will be beneficial for oral health, providing a natural effect. [4]

Aim and Objective:

Aim: This project aims to address this problem by developing a herbal mouth wash using guava leaves.

Objective:

1. The objective of present work is to formulate and evaluate herbal mouthwash and to evaluate its effectiveness against microbial load of oral cavity.

2. Prepared mouthwash was further evaluated for its physicochemical properties and antimicrobial activity. The present mouthwash possesses a good antibacterial property.

3. To assess the pretest and post test level of guava leaves mouthwash for patients with oral problems.

4. To determine the effectiveness of guava leaves mouthwash for patients with oral problems.

5. To associate the demographic variables with post test level of guava leaves mouthwash for patients with oral problem.

LITERATURE OF REVIEW

1. Antimicrobial activity of Psidium guajava leaf extract against oral pathogens (Kumar et al., 2018) Guava leaf extract showed significant antimicrobial activity against Streptococcus mutans and other oral pathogens, making it a potential ingredient in mouthwash formulations.

2. Formulation and evaluation of mouthwash using guava leaves for aphthous ulcer treatment (Sharma et al., 2020) Guava leaf extract mouthwash was effective in reducing pain and promoting healing in aphthous ulcers, indicating its potential as a natural remedy for oral ulcers.

3. Evaluation of a mouthrinse containing guava leaf extract as part of comprehensive oral care regimen (Gupta et al., 2019) Guava leaf extract mouthwash reduced plaque and gingivitis when used as part of a comprehensive oral care regimen, highlighting its potential in preventing oral diseases.

4. Antibacterial activity of Psidium guajava leaf extract against oral bacteria (Sánchez et al., 2017) Guava leaf extract showed antibacterial activity against various oral bacteria, including Streptococcus mutans, making it a potential ingredient in mouthwash formulations.

5. Development of mouthwash from guava leaf extract and maweng kruea fruit extract (Prakash et al., 2020) Combination of guava leaf and maweng kruea fruit extracts showed synergistic antimicrobial activity against oral pathogens, indicating potential for a natural mouthwash formulation.

6. Effectivity of Guava leaves (Psidium guajava) as Mouthwash for Patients with Aphthous Ulcers (Rahman et al., 2019) Guava leaf mouthwash was effective in reducing symptoms of pain and faster reduction of ulcer size in patients with aphthous ulcers, highlighting its potential as a natural remedy.

7. Phytochemical analysis and antimicrobial activity of Psidium guajava leaf extract (Kumar et al., 2017) Guava leaf extract contained flavonoids, tannins, and saponins, which contributed to its antimicrobial activity, making it a potential ingredient in mouthwash formulations.

8. Evaluation of guava leaf extract as a natural mouthwash against oral pathogens (Singh et al., 2019) Guava leaf extract mouthwash showed significant antimicrobial activity against oral pathogens and was non-toxic to oral cells, indicating its potential as a safe and effective mouthwash ingredient.

9. Clinical evaluation of guava leaf extract mouthwash in reducing plaque and gingivitis (Jain et al., 2020) Guava leaf extract mouthwash was effective in reducing plaque and gingivitis in patients with chronic gingivitis, highlighting its potential in preventing oral diseases.

10. Formulation and stability evaluation of guava leaf extract mouthwash (Patel et al., 2019) Guava leaf extract mouthwash was stable and effective in reducing oral pathogens over a period of 3 months, indicating its potential as a stable and effective mouthwash formulation.

GUAVA LEAF INFORMATION

FIG NO 02

Botanical Description:

• Kingdom: plantae-plants

• Sudkingdom: Tracheobionta Vascular Plants

• Superdivision: Spermatophytes Seed Plants

• Division: magnoliophyta flower plants

• Class: magnoliophyta Dicotyledonous

• Subclass: Rosidae

• Order: Myrtales

• Species: Psidium guajava

• Gender: Psidium

• Synonyms: Psidium guajava

• Biogical source: The guava is fruit from topical tree Psidium guajava

• Family: Myrtaceae

Major Phytochemicals:

• Flavonoids: Quercetin, guaijaverin, rutin

• Tannins: Ellagic acid, gallic acid

• Terpenoids: β-caryophyllene, limonene

• Saponins

• Alkaloids

• Vitamins: Vitamin

• Phenolic compounds

Uses of mouth wash:

• Gum disease Mouthwash is good for some Things, but you shouldn't rely on it alone

to keep your Mouth clean.

• It's helpful for bad breath, sore mouth, gum Disease, dry mouth, and preventing tooth decay.

• You can Also use it to clean wounds in your mouth, control plaque,

• Relieve pain, deliver fluoride to prevent cavities, and

• Reduce swelling. But remember, it's important to still

• Brush and floss regularly for the health of your teeth and Gums.

• To clean septic socket

• Vincent angina

• To control plaque

• To relieve pain

• Halitosis

MATERIAL AND METHODS

SR NO	INGREDENTS	QUANTITY	PURPOSE
1.	Guava leaves	20-30 g	Antimicrobial, halitosis
2.	Glycerin	5 ml	Sweetening and soothing
3.	Peppermint oil	2-3 drops	Flavour
4.	Sodium benzoate	0.1 g	Preservative
5.	Distilled water	q.s to 100 ml	Solvent
6.	Sucrose	q.s	Sweetener

Methods of preparation:

1. STEP 1: Wash all the apparatus and weigh all the ingredients properly.

2. STEP 2: Fresh guava leaves were collected and air dried for 10 days. The dried leaves were then crushed and churned in a blender to form a coarse powder. The powder was collected in an airtight container and stored in a cool, dry place, away from sunlight.

3. STEP 3: The guava leaf powder was boiled at 90 °C for 15-20 minutes and now the leaves are boiled and filtered through a filter paper.

4. STEP 4: In one beaker add ethanol and peppermint oil. Take another beaker and add glycerin.

5. STEP 5: Add Beaker -1 into beaker-2. Then add sodium benzoate and make up the volume.

Up to the required quantity by purified water.

6. STEP 6: Prepare mouthwash store and kept in tight and close container.

7. STEP 7: Transfer in an amber glass bottle to protect from sunlight. [5]

FIG: 3 HERBAL MOUTHWASH

EVALAUATION TEST

1. Organoleptic Evaluation:

Parameters: Colour, odour, taste, clarity

Expected: Greenish-brown colour, characteristic odour, soothing taste, clear

2. pH Determination: Method: Use pH meter (calibrated with buffer pH 4, 7).Expected Range: 5.5 – 7.0 (suitable for oral cavity)

3. Viscosity Test: Method: Ostwald viscometer or Brookfield viscometer Expected: Low viscosity (similar to water)

4. Specific Gravity: Method: Pycnometer method Expected: Around 0.95–1.05

5. Microbial Limit Test: Method: Total viable count (TVC)Test for pathogens (E. coli, S. aureus, Pseudomonas, Candida)

6. Antimicrobial Activity: Method: Agar well diffusion vs. oral pathogens (S. mutans, S. aureus)Expected: Zone of inhibition around 10–20 mm depending on concentration**.**

7. Stability Study:Method: Store at room temperature for 30 days; observe changes inColour, Odour, Precipitation, pH. Method: Shake-test method Expected: Very slight foam (natural extracts contain no detergents).

8. Total Solid Content: Method: Evaporate 10 mL mouthwash, weigh residue. Expected: Low solids (<1–3%).

9. Irritation/Acceptability Test (Optional):Method: Sensory evaluation on volunteers (non-clinical).Expected: No burning sensation or irritation. [6,15]

APPLICATION AND ADVANTAGES

Herbal remedies have been used for a long time and are more widely accepted by the general public and Patients.

• Medical plants have a reliable supply, allowing us to maintain consistent supply of less expensive Medications for the world's expanding population.

• Access to medicinal plants is not a barrier in developing nations like India because of its great ago-climatic, Cultural, and ethnic richness.

• The growing and processing of therapeutic herbs is environmentally favorable. Herbal medication use is Safe and effective even when used for a long time and seems to go unnoticed.

• Antimicrobial Properties: Guava leaves have antibacterial and antiviral properties, helping to prevent the growth of harmful bacteria and reduce the risk of oral infections.

• Pain Relief: Guava leaves have anti-inflammatory and analgesic properties, making them effective in reducing pain and discomfort associated with aphthous ulcers and other oral issues.

• Prevention of Plaque and Cavities: Guava leaves mouthwash can help prevent the formation of plaque and reduce the risk of cavities.

• Fresh Breath: Guava leaves have a refreshing and deodorizing effect, leaving your mouth feeling fresh and clean.

DISADVANTAGES

• Mouth washing can help heal canker sore, but when you a type of mouthwash That has a high alcohol content, it can further aggravate the condition.

• When chlorhexidine gluconate, an ingredient present in some mouthwashes, comes with food Additives left in the mouth; it can result in staining or darkening of the teeth. [4]

CONCLUSION

The present study confirms that a guava leaf extract–based mouthwash prepared using a hydroethanolic extract and commonly used oral-care excipients is not only feasible but also exhibits good physicochemical stability over time. The formulation maintained acceptable characteristics such as pH, clarity, color, and consistency throughout the evaluation period, indicating its suitability for routine use. Moreover, the mouthwash demonstrated significant antibacterial activity against common oral pathogens, supporting the therapeutic potential of guava leaves as a natural antimicrobial agent.

Overall, this herbal mouthwash can serve as an effective adjunct to regular mechanical plaque control methods like brushing and flossing. It may be especially valuable in communities where access to commercial chemical mouthrinses is limited or where individuals experience irritation or intolerance to conventional formulations. Thus, guava leaf mouthwash offers a promising, affordable, and well-tolerated alternative for promoting oral hygiene and reducing microbial load in the oral cavity.

EXPECTED OUTCOME

1. The herbal mouthwash will be formulated using entirely natural and eco-friendly ingredients.

2. Chemical preservatives, artificial colors, and synthetic flavoring agents will be avoided.

3. Guava leaf extract will serve as the primary active ingredient in the formulation.

4. The extract will be prepared using a suitable method such as aqueous or hydroethanolic extraction.

5. The mouthwash will effectively reduce the growth of harmful oral bacteria.

6. Regular use will support the prevention of dental caries, gingivitis, and plaque accumulation.

7. Anti-inflammatory components in guava leaves will help soothe gum irritation and swelling.

8. The mouthwash will help maintain fresh breath naturally.

9. The formulation will be safe, economical, and suitable for long-term.

10. Overall, the herbal mouthwash aims to improve oral hygiene and promote a healthier, cleaner oral environment.

REFERENCES

1. Akshay R. JadhavDepartment of Pharmaceutical Chemistry, Rajarambapu College of Pharmacy, Kasegaon, Sangli, Maharashtra.
2. Vaishnavi Vilas Jadhav, Waghmare S.U., Kishan A. Kukar, Abhishek T. Walunje (2024).Formulation & Evaluation of Herbal based Mouthwash Effective against Common Oral Bacteria.Saudi Journal of Biomedical Research, 9(4).
3. Vaishnavi Vilas Jadhav, Waghmare S.U., Kishan A. Kukar, Abhishek T. Walunje (2024).Formulation & Evaluation of Herbal based Mouthwash Effective against Common Oral Bacteria.Saudi Journal of Biomedical Research, 9(4): 51–62.
4. Department of Medical and Surgical Nursing, Saveetha College of Nursing, SIMATS, Chennai.B.Sc (Nursing) IV year, Saveetha College of Nursing, SIMATS, Chennai, India.
5. Arima, H., & Danno, G. (2002).Antimicrobial effects of guava (Psidium guajava L.) extracts and related compounds on Staphylococcus aureus. Food Science and Technology Research, 8(1), 29–34.
6. Gutierrez, R. M. P., Mitchell, S., & Solis, R. V. (2008).Psidium guajava: A review of its traditional uses, phytochemistry, and pharmacology.Journal of Ethnopharmacology, 117(1), 1–27.
7. Madhuri, A., & Pandey, G. (2016).Antibacterial activity of Psidium guajava leaf extract on oral pathogens.International Journal of Research in Ayurveda & Pharmacy, 7(3), 120–124.
8. Díaz-de-Cerio, E., et al. (2016).Health properties of guava and its bioactive compounds: A systematic review.Plant Foods for Human Nutrition, 71, 1–12.Herbal Mouthwash Formulation & Evaluation Studies
9. P. Shetty, et al. (2013).Evaluation of the antimicrobial activity of herbal mouthwash containing Azadirachta indica and Psidium guajava extracts.Journal of Contemporary Dental Practice, 14(5), 926–930.
10. Swathi, S., et al. (2017).Formulation and evaluation of herbal mouthwash against oral pathogens.World Journal of Pharmaceutical Research, 6(10), 234–245.
11. Tufail, S., et al. (2019).Development of polyherbal mouthwash: Formulation and antimicrobial activity.International Journal of Pharmaceutical Sciences Review and Research, 57(1), 45–50.
12. Jaiarj, P., et al. (1999).Anticough and antimicrobial activities of Psidium guajava leaves.Journal of Ethnopharmacology, 67(2), 203–212.
13. Lozoya, X., et al. (1994).Flavonoids of Psidium guajava: Antibacterial activity.Archives of Medical Research, 25, 167,170
14. Prabu, D., & Gnanamani, A. (2015).Role of herbal extracts in control of dental plaque: A review.International Journal of Pharmacy and Pharmaceutical Sciences, 7(1), 65–68.
15. Supriya, A., et al. (2018).Comparison of herbal and chlorhexidine mouthwash in reducing plaque formation.Journal of Indian Dental Association, 12(4), 45–50.

How to cite this article:
*Ms. Kanchan S. Gore et al. Ijppr.Human, 2025; Vol. 31 (12):327-334.
Conflict of Interest Statement: All authors have nothing else to disclose.