CODEN [USA]: IAJPBB ISSN : 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES
SJIF Impact Factor: 7.187

Available online at: http://www.iajps.com *Review Article*

A REVIEW ARTICLE ON POLYHERBAL MOUTHWASH TO APTHOUR ULCER

Maviya Choudhari[1*], Sarika Prakash Chavan[2], Sapna Ghuge[3], Dr. Kavita kulkarni[4]
Shri Sai Institute of Pharmacy and Research, Chh. Sambhajinagar, Maharashtra, India-431001

Abstract:
Recurrent aphthous stomatitis (RAS), commonly known as aphthous ulcer or canker sores, causes pain and discomfort for millions worldwide. Conventional therapies such as topical corticosteroids and antiseptic mouthwashes provide relief but may have side effects or limited long-term use. Polyherbal mouthwashes—formulations that combine multiple plant extracts—offer a promising alternative by using synergistic antimicrobial, anti-inflammatory, analgesic, and wound-healing properties of herbs. This review summarizes the biology of aphthous ulcers, rationale for polyherbal therapy, commonly used herbs, formulation considerations, clinical evidence, safety concerns, and future directions. The review highlights clinical trials and systematic findings supporting herbs such as Aloe vera, chamomile, myrrh, licorice (Glycyrrhiza glabra), turmeric (Curcuma longa), and others in oral ulcer care. The review aims to provide a practical, patient-friendly perspective suitable for researchers, clinicians, and students.

KEYWORDS: *Recurrent aphthous stomatitis (RAS)Polyherbal mouthwashes, Glycyrrhiza glabra, aphthous ulcers, tulsi etc.*

Corresponding author:
Maviya Choudhari,
Student,
Shri Sai Institute of Pharmacy and Research,
Chh. Sambhajinagar, Maharashtra, India-431001
Email ID: maviyachoudhari7771@gamil.com

QR CODE

Please cite this article in press ***Maviya Choudhari*** *et al.,* ***A Review Article On Polyherbal Mouthwash To Apthour Ulcer****, Indo Am. J. P. Sci, 2025; 12(11).*

INTRODUCTION:

Mouthwashes are aqueous topical medications that function by rinsing and gargling inside of the mouth. There are multiple mouthwashes available over the counter and by prescription with a wide range of active ingredients that can be used as an adjunct to aid in the multifactorial management of complex oral conditions, including halitosis, gingivitis, periodontal disease, oral mucositis and even xerostomia among others. More recently many mouthwashes have been implicated in the prophylactic treatment of potentially infected coronavirus disease 2019 (COVID-19) patients as a pre-procedural rinse.

Throughout history humankind has recognized the importance of oral hygiene. Archaeologists have uncovered toothpicks dating as far as 3000 B.C. It appears even the practice of mouth rinsing has been used by humans for more than 2000 years, originating from Chinese medicine. It was at the end of the 19th century that oral hygiene practice truly began to change when a dentist trained in microbiology, Willoughby D. Miller, published "Micro-organisms of the human mouth".

Generally speaking, there are two types of mouthwash products: cosmetic and therapeutic. Cosmetic mouthwash lacks active ingredients that provide a true chemical or biological application, they may temporarily control bad breath by leaving a pleasant taste, but they do not kill the bacteria associated with it. Oppositely, therapeutic mouthwash does contain active ingredients. In other words, cosmetic mouthwashes cannot act as an antimicrobial and lack the bacteriostatic and bactericidal benefits that are provided by therapeutic mouthwashes. When therapeutic mouthwash is prescribed by a clinician it is often short-term, and always evidence based for addressing specific conditions. When used correctly therapeutic mouthwashes have been clinically effective in reducing dental biofilm accumulation, as well as an adjunct in the treatment of halitosis and periodontal disease, such as gingivitis and periodontitis,



Herbal therapeutic and cosmetic mouthwashes are oral care products made from natural plant extract and essential oils. These mouthwashes offer both therapeutic and cosmetic benefits for oral hygiene. They typically contain ingredient such as mint, eucalyptus, tea tree oil, clove, and other herbal extracts known for their antibacterial, antifungal, and anti-inflammatory properties

Therapeutic herbal mouthwashes can help combs bad breath, reduce plaque and gingivitis, soothe gum inflammation, and promote overall oral health. They may also provide relief from minor oral discomforts such as canker sores or mouth ulcers
On the cosmetic side, these mouthwashes often provide a refreshing sensation, leaving the auth feeling clean and revitalized. They can also help whiten teeth, although the effects may be more subtle compared to traditional whitening products
Many people prefer herbal mouthwashes due to their natural ingredients and potentially fewer synthetic chemicals. Herbal mouthwashes, derived from natural ingredients such as plants and herbs, offer several benefits that make them increasingly popular alternatives in conventional mouthwashes, here are some of the key reasons why herbal mouthwashes are important:

1. Natural Ingredients
2. Antibacterial Properties
3. Anti-inflammatory
4. Reduce side effect
5. Fresh breath

Natural herbs such as tubi, guava, peppermint, triphala, neem, pomegranate, dove oil, grapefruit, green tea, propolis, alwain, pudina, aloe vera, pudina, ajwain, white oak bark, myrrh gum and so on can be used in combination or in alone. Natural mouthwashes contains herbal extracts, essential oils can provide connective tissue rebuilding properties and strength overall health

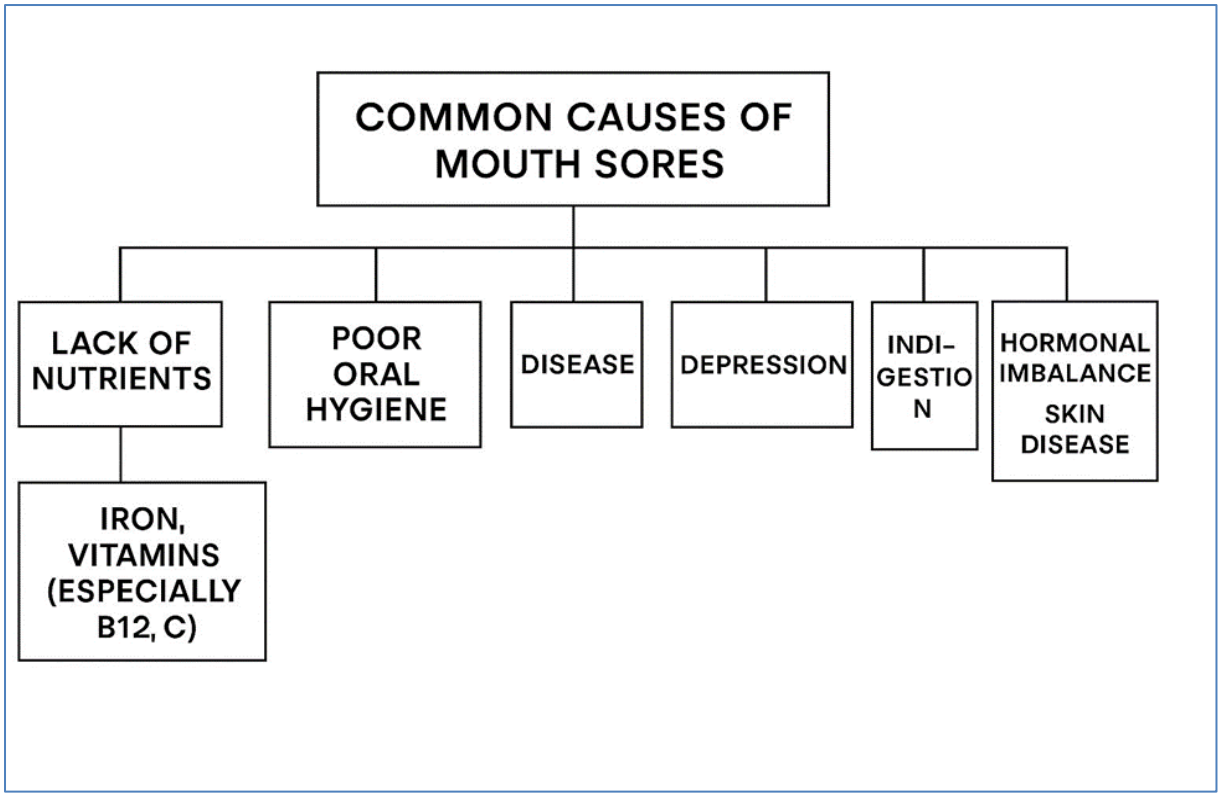
DISEASES

Mouth ulcer is painful sores that can occur anywhere inside the mouth. This leaf let is about the most common type of mouth ulcers, which is Aphthous Mouth Ulcer are one of the most common oral diseases some stages in their lives. Worldwide At least one 1-5 people can develop Aphthous mouth ulcer at Women's are affected more than men's.



Figure 1: Aphthous mouth ulcer

An oral ulcer (also called a mouth ulcer or mucosal ulcer) is an ulcer that occurs in the mucous membranes of the mouth. Their clinical representation is characterized by multiple, recurrent, small, round or oval ulcers that form in the mouth, especially Lyon inside the cheeks or lips. Mouth sores, also known as aphthous sores, can be painful when we eat, drink or brush our teeth. It is usually yellow or white and usually looks like pressure on the mouth which is a mucous membrane.



Types OF APHTHOUS ULCER:

Minor – small, shallow, most common.

Major– larger, deeper, may scar.

Herpetiform– clusters of tiny ulcers.

Recurrent Aphthous Stomatitis (RAS)- ≥4 times/year

- Often idiopathic, but may be linked to:
- GI issues (e.g., IBD, celiac)
- Nutritional deficiency (iron, folate, B12)
- Immune issues (HIV, neutropenia)
- Syndromes (e.g., Behçet's disease)

Differential Diagnosis:

Acute ulcers → trauma, infections, systemic diseases

Recurrent ulcers → postherpetic erythema multiforme

Chronic ulcers → tumors, drug-induced, sialo metaplasia

Anatomy of Buccal Cavity

The thin and highly permeable membrane of the sublingual tissue remains a perfect target if promote onset is desired.Considerable surface area and high blood flow to this region provides a means for rapid access to the systemic circulation.

Function of teeth and reasons of dental disorders :

Candies, chocolates, jellies, and other foods with a high sugar content etc which attaches to the enamel of the tooth and produces a cavity. The tooth enamel may also be damaged and eroded, resulting in deep eruption of the dentine and discolouration [13] . Toothache, often known as dental pain, is a type of discomfort that affects the teeth and their supporting tissues. Inflammation of the pulp temporomandibular dysfunction are all common causes [14].The major cause of dental caries, gingivitis,and periodontitis is dental biofilms [15]. Periodontal disease is a condition that damages the teeth's supporting tissues and is caused by poor dental hygiene. It can also lead to gingivitis [16]. Halitosis is the unpleasant smell expelled from a person's mouth. It is also called as bad breath, oral malodour .

Mouthwash can be used in the following cases:

1. Gum disease
2. Mucositis
3. Halitosis
4. Periodontal disease
5. Xerostomia
6. To clean septic sockets
7. To control plaque
8. To relive pain

To effectively delivered fluoride to prevent dental caries

1. Reduce inflammation
2. Breath freshener
3. Advantages of mouthwash
4. Fresh breath
5. Prevent build-up of space
6. Helps to fight cavities
7. Whitens the teeth
8. Cure canker sores

Disadvantages of the mouthwash

1. Mouthwash be dangerous to children below 6 years.
2. Mouthwash can stain and darken teeth.

3. It can damage some parts of the mouth,
4. Many mouthwash contain alcohol that make teeth more sensitive

INGREDIENTS /HERBS USED IN MOUTHWASH:

1. Tulsi (Ocimum baslicum. Holy Basil) It consists of fresh and dried leaves of Ocimum sanctum Linn, belonging to family Lamiaceae. It is found throughout India and is considered sacred. Tulsi contains (0.1-09%) volatile oil, this oil has antibacterial and insecticidal activity. It contains approximately 70% eugenol, 3% carvacrol, 20% eugenolmethylether , Methanolic extract and aqueous suspension of Tulsi has antipyretic and anti-inflammatory action and according in study it inhibits COX2 proving its anti-inflammatory property . It shows sensitivity towards Staphylococcus aureus, candida albicans, Bacillus subtilis, and Escherichia coli and shows resistance towards Streptococcus pyogenes, Lactobacillus



Fig. : Tulsi leaves (dried)

Tulsi

is rich in antioxidants. Antioxidants protect the cells from the damage by free radical. Basil has strong history in ancient traditional medicinal system of India, Ayurveda, in addition to other medicinal herbal traditions. As far as Ayurvedic treatments are concerned, the holy herb is used in about 300 treatment cases. This shows its medicinal importance throughout the world, this wonder herb has been used for centuries in various forms like dried powder, herbal in, or oil. It is antibacterial, anti-inflammatory, antioxidant, and anti-depressive.

Uses of Tulsi

Anti-bacterial Properties: Experts discovered that basil can restrict the growth of numerous bacteria such as Staphylococcus aureus, Listeria monocytogenes, Yersinia enterocolitica, Escherichia coli, and Pseudomonas aeruginosa. Many species of pathogenic bacteria cannot be treated with the use of antibiotic drags because of their resistant ability over time. However, essential oil of basil is effective in stopping the growth of pathogenic bacteria. These bacteria have built a high level of resistance to antibiotic drugs, therefore, the treatment with antibiotic drugs is not effective anymore. However, basil can work. One of the benefits of basil leaves for the health is DNA protection. Phytonutrients like vicenin and orientin are effective in protecting chromosomes as well as cell structures from oxygen-based damage and radiation

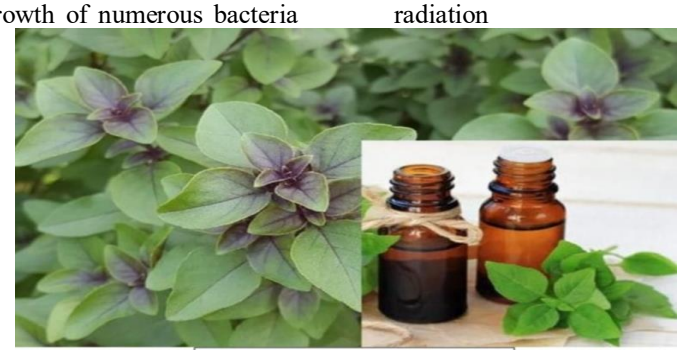


Fig. : Tulsi leaves and extract

2. Cinnamon (Cinnamomum zeylanicum):

Its a spice obtained from the inner bark of several tree species from the genus Cinnamomum. Cinnamomum verum, commonly referred true cinnamon of Ceylon cinnamon, is considered to be the "real", cinnamon prized for its delicate flavour and aroma. It is native to Sri Lanka (formerly known as Ceylon), although it is also cultivated in other regions such as India, Madagascar, and the Caribbean, cinnamon has been used for centuries not only as a spice but also for its medicinal properties



Fig. : Cinnamon bark and cinnamon oil

Uses of cinnamon

1. Anti-inflammatory Properties Cinnamon contains compounds with anti-inflammatory properties, which can be beneficial for conditions such as arthritis or other inflammatory disorders. Herbal preparations may include cinnamon for its potential to alleviate inflammation.

2. Antimicrobial Activity: Cinnamon has natural antimicrobial properties, particularly against bacteria and fungi. In herbal preparations, it may be included to help combat various infections, including respiratory infections, urinary tract infections, and skin infections

. 3. Aromatic Properties. Cinnamon possesses a pleasant aroma and flavor, making it a popular ingredient in herbal preparations aimed at improving taste and aroma. It can enhance the palatability of herbal teas, tinctures, and other formulations.

4. Antioxidant Activity: Cinnamon contains antioxidants that help protect the body from oxidative stress and damage caused by free radicals. Herbal preparations may leverage cinnamon's antioxidant properties to promote overall health and well-being



Fig. : peppermint oil.

5. Additional ingredient for cosmetic benefits - Activated charcoal : Activated charcoal is a fine, black powder made from various natural substances, such as coconut shells, wood, peat, or coal. It's "activated" through a process that exposes it to high temperatures, creating pores that increase its surface area and ability to adsorb (not absorb) toxins and impurities.

Sources:

- Coconut shells: Activated charcoal derived from coconut shells is widely used in health and wellness products due to its sustainability and purity.

3. Peppermint (Mentha piperita)

(Brandy Mint) the oil obtained by the distillation of Mentha Piperita, belonging so family Labiatae.li is mainly found in Europe, United states and also in some places in England. The chief constituents of peppermint oil are menthol, along with others like methyl acetate isovalerate, menthone, cineol, inactive pinene, limonene, and other . It is mint that is commercially used in soaps toothpaste, mouthwash. It has been used to treat gingivitis, headaches, indigestion, and other ailments .Peppermint essential oil has antiviral and antibacterial properties. It is excellent mouth freshener. When using peppermint tea as breath freshener increase effectiveness by adding the pinch of anise, caraway or cinnamon Avoided in patients with liver damage, inflammation of the gall bladder or obstruction of bile duct. Adverse effects are reported is burning and gastrointestinal ups skin rashes, headache, heartburn, ataxia, etc.

- Wood: Charcoal made from hardwood, such as oak or maple, can also be activated for various applications.
- Peat: Less commonly used but still available, peat-derived activated charcoal offers an alternative source.

  Uses in Herbal Mouthwash: Activated charcoal is incorporated into herbal mouthwash for several purposes:
- Teeth Whitening: Activated charcoal is believed to adsorb surface stains and toxins, contributing to a brighter smile. However, its long-term efficacy and safety for enamel are topic of debate among dental professionals.
- Freshening Breath: Its adsorptive properties make activated charcoal effective in trapping odour-causing compounds, thereby freshening breath.
- Antibacterial Properties: While not as potent as traditional antibacterial agents like chlorhexidine, activated charcoal may exhibit mild antibacterial properties, potentially aiding in reducing oral bacteria responsible for bad breath and plaque formation.

- Toxin Removal: Activated charcoal has a long history of use in medical emergencies for toxin removal. In mouthwash, it may assist in trapping and removing toxins from

MATERIAL AND METHODS:

Equipment required: beakers Pyrex brand, conical flask, glass rod/stirrer-bexco brand, funnel, measuring cylinder, burners, lighter, butter paper, spatula, weighing balance, viscometer, pH meter, water bath, stand, mesh, tong, and filter paper.

Procedure:

Tulsi extract

1. Tulsi extract for the study was obtained by washing the leaves clean and sundry then after that grinded into miser to get fine powder of the dried leaves. Then the powder was macerated with 100% ethanol for 48 Hr in the breaker, then filtered the solution with the whattmans Filter paper. The obtained extract was used for procedure
2. Combination of oils the combination of cinnamon oil with clove oil gives additive effect Therefore, these oils are used in combination in the ratio as follows, clove oil Cinnamon oil 27:73% v/v This increased the anti-bacterial property and biofilm degradation potency (synergism effect)
3. In the obtained Tulsi extract, add accurately weighed liquorice powder, cinnamon oil, clove oil, peppermint oil, glycerol, and SLS then triturate.
4. In the above solution, weighed quantity of activated charcoal powder and Nat were added, the volume make up was done using water.
5. The above mister was passed through whattman filter paper to obtain the final solution.

Evaluation of herbal mouthwash:-

1. pH of Formulation:

Ideal range of pH of mouthwash is 4.5 – 7.5, hence the mouthwashes are appropriate for this pH range of
formulation. The greatest way to maintain a healthy pH level in the mouth is through the foods you eat.
The pH level in the mouth has a direct impact on the health of our teeth and gums.
Reason: Maintaining pH within this range ensures compatibility with oral tissues and prevents enamel erosion or irritation.
Your chance of developing cavities, gum disease, and tooth decay will be reduced by controlling the pH in your mouth.

2. Sensory Evaluation Test:

- Organoleptic properties (odour, taste, colour).
- Ideal Range: Pleasant aroma and taste, uniform colour.
  Reason: Enhances user acceptance and compliance with regular use.

3. Viscosity:

- Viscosity is a crucial parameter for evaluating herbal mouthwash as it directly influences its pourability, spreadability, and overall user experience. The ideal viscosity ensures that the mouthwash is easy to dispense, effectively coats the oral surfaces, and remains in contact with the teeth and gums for an adequate period to exert its therapeutic effects.
  The ideal viscosity of herbal mouthwash typically falls within the range of 10 to 100 cP at room temperature (25°C). However, the specific ideal viscosity may vary depending on the formulation, intended use, and desired user experience.
- Reasons: Ease of Dispensing: Mouthwashes with lower viscosities are easier to pour and dispense from the bottle or mouthwash dispenser, enhancing user convenience and compliance with regular oral hygiene routines.
- Uniform Coating: An ideal viscosity ensures that the mouthwash spreads evenly throughout the oral cavity, effectively coating the teeth, gums, and other oral surfaces. This promotes uniform distribution of active herbal ingredients for maximum therapeutic benefits.
- Improved Palatability: Mouthwashes with appropriate viscosities offer a balanced texture that ineither too thick nor too thin, resulting in a pleasant mouthfeel and improved palatability. This encourages users to use the mouthwash regularly as part of their oral care routine.

1. **Packaging Integrity - Test:** Leakage and seal integrity testing.

Ideal Range: No leakage or compromised seals.
Reason: Prevents contamination and maintains product quality throughout shelf life.

5. Labelling Compliance - Test: Compliance with regulatory requirements (e.g., ingredient listing, usage instructions).
Ideal Range: Accurate and comprehensive labelling.
Reason: Ensures consumers have clear information about the product and its proper use.

6. Stability Testing - Test: Accelerated stability testing (e.g., at elevated temperature and humidity).

Ideal Range: No significant change in physical appearance, pH, or antimicrobial activity.
Reason: Ensures the product remains effective and safe under various storage conditions.

DISCUSSION:

This study set out to explore whether a polyherbal mouthwash could serve as an effective and safer alternative to chemical mouthwashes currently used for conditions like aphthous ulcers. Aphthous ulcers, also known as canker sores, are common, painful, and often recurrent, making them a frustrating oral health issue. While conventional treatments like corticosteroids or antiseptic mouthwashes are helpful, they may bring along side effects, especially with long-term use.

By focusing on herbs such as tulsi, cinnamon, licorice, peppermint, and natural additives like activated charcoal, this formulation attempts to combine multiple useful properties—antibacterial, anti-inflammatory, antioxidant, and even mild analgesic effects. The idea is that these herbs can work together in a synergistic way, offering relief with fewer risks compared to mouthwashes that contain alcohol or chemical antiseptics.

The research also highlights the importance of maintaining the correct pH and viscosity in a mouthwash. Keeping the pH between 4.5 and 7.5 helps protect tooth enamel and avoid irritation, while an optimal viscosity ensures the liquid can easily coat the mouth and deliver its therapeutic ingredients effectively.

Sensory features such as taste, smell, and appearance also play a major role in user acceptance. If a mouthwash tastes too bitter or has an unpleasant smell, people are less likely to use it consistently—even if it works. Here, ingredients like peppermint and cinnamon serve a dual purpose: they improve effectiveness and make the formulation more pleasant.

Another point of focus is that herbal mouthwashes can address specific oral problems like halitosis, gum inflammation, plaque buildup, and minor ulcers—without the risk of tooth staining, burning sensation, or dryness, which can occur with chemical-based mouthwashes. Activated charcoal, for example, adds cosmetic benefits by helping with stain removal and breath freshness, although its use must be balanced to avoid enamel damage.
In comparison with commercial formulations, the herbal mouthwash developed in this study offers significant benefits: it is naturally derived, cost-effective, and has a low risk of side effects. While more clinical evaluation may still be needed to fully establish its long-term safety and effectiveness, the results so far are promising.

Overall, these findings support the growing interest in plant-based oral care. Herbal mouthwashes could become a reliable and gentle option for managing recurrent mouth ulcers and promoting general oral hygiene—especially for people looking to avoid synthetic chemicals.

CONCLUSION:

According to the information presented in this study, the created herbal mouthwash has significant therapeutic potential and is an appropriate vehicle for medication delivery at a reasonable cost. When compared to commercial mouthwash, herbal mouthwash formulations work effectively and have few side effects; as a result, their use should be increased to prevent negative consequences. The current liquid herbal mouthwash may be really effective in assisting people to get rid of foul breath and other oral health issues.

REFERENCE:

1. Ajay S. Dongarwar, Dinesh P. Borkar and etal. Formulation and Evaluation of Herbal Aqueous Gel Form Mouth Ulcer. European Journal of Pharmaceutical and Medical Research, 2022:9(7), 256-262.
2. Miss. Harshada B. Tribhuvan, Miss. Sapana S. Mhaske and etal. Formulation and Evaluation of Pharmaceutical Aqueous Gel for Mouth Ulcer Treatment: International Journal of Scientific Research in Science and Technology,2022:9(4),34-40.
3. Loic Vaillant, Mahtab Samimi Presse Medicale (Paris, France: 1983) 45 (2), 215-226, 2016
4. D. Harris, J.R. Robinson, Drug Delivery via the Mucous Membranes of the Oral Cavity, Journal of Pharma Sciences. (1992):81: 1-10.
5. Nazila Salamat-Miller, Montakarn Chitt Chang, Thomas P, Johnston, The use of Mucoadhesive Polymers in Buccal Drug Delivery, Advanced Drug Delivery Reviews Elsevier (2005); 57:1666-1691.
6. Mandel, T. D. Chemotherapeutic agents for controlling plaque and gingivitis.
7. Van Der Weijden, F.A. Et al Can Chemical Mouthwash Agents Achieve Plaque Gingivitis Control" KEYWORDS Dental plaque Gingivitis Mouthwash Mouthrinse Systematic review Meta-review KEY POINTS. Dent. Clin. NA 59, 799-829 (2015).
8. Kilian, M. Et al. The oral microbiome-An update for oral healthcare professionals. Br. Dent. J. 221. 657-666 (2016).
9. Farah, C. S., Mcintosh, L. & McCullough, M. J. Mouthwashes. Australian Prescriber vol. 32 162-164 (2009)
10. Chye, R. M. L.. Perrotti, V., Piattelli, A., laculli, F. & Quaranta, A. Effectiveness of Different Commercial Chlorhexidine-Based Mouthwashes after Periodontal and Implant Surgery: A Systematic Review. Implant Dentistry vol. 28 74-85 (2019).
11. Joshipura, K. J., Mu Noz-Torres, F. J., Morou-Bermudez, E. & Patel, R. P. Over-the-counter

mouthwash use and risk of pre-diabetes/diabetes. Nitric Oxide 71, 14-20 (2017).
12. Periodontal Disease | Oral Health Conditions Division of Oral Health CDC. Center for Disease Control and Prevention https://www.cdc.gov/oralhealth/conditions/periodontal-disease.html
13. Chapple, 1. L. C. Et al. Primary prevention of periodontitis: managing gingivitis. J Clin Periodontal 42, 71-76(2015).
14. S. S. Et al. Comparative Evaluation of Cocoa Bean Husk, Ginger and Chlorhexidine Mouth Washes in the Reduction of Streptococcus Mutans and Lactobacillus Count in Saliva. A Randomized Controlled Trial. Cureus 11. (2019).
15. American Dental Association. Mouthwash (Mouthrinse), http://www.ada.org/em/member-cental/oral-health-topics/mouthrinse (2019).
16. Chlorhexidine C22H30C12N10-PubChem. https://pubchem.ncbi.nlm.nih.gov/compound/9552079
17. Elkerbout, T., Slot, D., Van Loveren, C. & Van der Weijden, G. Will a chlorhexidine-fluoride mouthwash reduce plaque and gingivitis Int. J. Dent. Hyg. 17, 3-15 (2019).
18. Banu NJ and Gayathri V. Preparation of Antibacterial Herbal Mouthwash Against Oral Pathogen. International Journal of Current Microbiology and Applied Sciences 2016; 5(11):205-221
19. Varalakshmi. E. Ramya. A Study to Assess Effectiveness of The Guava Leaves Mouthwash for Patients with Oral Problems. International Journal of Engineering Research and General Science Sept-Oct2019;7(5):35-42
20. Takenaka S, Ohsumi T, Noiri Y. Evidence Based Strategy for Dental Biofilms: Current Evidence Of Mouthwashes On Dental Biofilm And Gingivitis. Japnese Dental Science Review 2019,55:33 40
21. Jalaluddin Md. Rajaekaran UB, Paul S, Dhanya RS, Sudeep CB, Adarsh VI. Comparative Evaluation of Neem Mouthwash on Plaque And Gingivitis: A Double Blind Crossover Study. The Journal of Contemporary Dental Practice. July 2017;18(7):567-568.
22. Ashwin. K.S. Karthikeyan. M, Nirmalkumar. R. Rajanivetha, Priyadarshini. R. Halitosis: a Short Review. Research J. Pharm. and Tech. 7(12): Dec. 2014; Page 1494-1497
23. Raj D. Thangavelu L, Ganapathy D. Herbal Mouthwash. Drag Invention Today 2019, 12(10):2325-2328.
24. http://ensuredentalcare.comadvantages-and-disadvantages-of-mouthwash/
25. Lakshmi T, Krishna V. Rajendra R. Azadirachta Indica. A. Herbal Panacea In Dentistry- an update Pharmacognosy Reviews. Jan-june 2015:9(17):41-44.
26. Hosamane M, Acharya AB. Evaluation of Holy Basil Mouthwash as An Adjunctive Plaque Control Agent in Afour Day Plaque Regrowth Model. Journal Clinical Experimental Dentistry 2014:6(5):491-e496.
27. Banu NJ and Gayathri V. Preparation of Antibacterial Herbal Mouthwash Againt Oral Pathogen. International Journal of Current Microbiology and Applied Sciences 2016; 5(11):205-221.
28. Thombre N. Thete M, Shimpi P. Review on Role of Herbs in Management of Oral diseases. Asian J. Pharm. Res. 2020; 10(4):321-326. Doi: 10.5958/2231-5691 2020.00055.6
29. Durbar U, Geetha R.V. Antibacterial Effects of South Indian Spices on Oral Microbes. Research 1. Pharm. And Tech, 8(8): August, 2015; Page 1135-1136. Doi: 10.5958/0974-360X 2015.00201.2.
30. Shankar S. Gopinath P, E. Roja. Role of Spices and Herbs in Controlling Dental Problems. Research Journal of Pharmacology and Pharmacodynamics. 2022;14(1):23-8. Doi: 10.52711/2321-5836.2022.00004.
31. Shah B and Seth AK. Textbook Of Pharmacognosy and Phytochemistry. 1sTEdition Elsevier 238-240,259-260,284-285,290-291,306-307-315-316489-490,551-552.
32. Prashar D, Jasra K. Pharmacognostic, Phytochemical and Therapeutic Overview of three Allied Herbs used in Dentistry. Asian Journal of Research in Pharmaceutical Sciences. 2021; 11(2):121-5. Doi: 10.52711/2231-5659.2021-11-2-5.
33. Reddy Dr H And Dr. Preethi Herbal Mouthwashes. European Journal of Nmolecule and Clinical Medicine 2020:7(2):6655-6661.
34. Anushri M. Yashoda R. Puranik M. Herbs: A Good Alternative to Current Treatments For Oral Health Problems. International Journal of Advance Health Science. April 2015;1(12):26-32