



Antiseptic Herbal Mouthwash: A Review

Kumar Rishav^{1*}, Sherpa Rinkila^{1*}, Kumar Abhishek^{1*}, Sharma Shivani^{2*}

¹Student, B. Pharma, Dev Bhoomi Institute of Pharmacy and Research, Dehradun

²Assistant Professor, School of Pharmacy and Research, Dev Bhoomi Uttarakhand University, Dehradun

Abstract:

In the oral care industry, herbal products are becoming more and more popular. Several herbal components relevant to this topic have a wealth of clinical evidence supporting their usage in mouthwashes. Due to its biologic and therapeutic qualities, the tea plant, *Camellia sinensis*, has drawn the attention of many researchers in the fields of pharmaceutical sciences and dentistry in recent years. This plant is a good option for making mouthwashes because of its anti-inflammatory, anti-oxidant, and anti-septic properties. We attempted to locate, assess, and classify the scant information regarding *Camellia inensis* mouthwashes in the medical literature in this systematic review.

Using the terms tea, dental care, *Camellia sinensis*, and mouthwash, we searched three scientific databases and discovered 69 relevant papers, 41 of which were optimized controlled trials (RCTs), most of which suggested anti-microbial. These tea preparations have analgesic and anti-plaque implications. Given the predominant pattern in clinical data and their advantageous safety profile, products derived from *Camellia sinensis* possess the potential to function as antiseptic, anti-plaque, and anti-inflammatory agents. As such, they may prove to be valuable mouthwashes in subsequent clinical investigations and everyday usage.

Keywords: herbal oral care, *Camellia sinensis*, tea mouthwash, dental hygiene, clinical trials, anti-inflammatory, antioxidant, antimicrobial, analgesic, anti-plaque, systematic review.

Introduction :

The most widely used self-performed oral hygiene technique at the moment to mechanically remove dental plaque is brushing. But most people's mechanical method is frequently insufficiently effective indicating that mouthwashes with chemical plaque management could be helpful as an addition to regular dental care. The gold standard for chemical dental plaque control is chlorhexidine (CHX), a broad-spectrum antiseptic. However, long-term use of CHX mouthwashes can cause taste disturbances, discoloration of teeth and tongue, and negative effects on the oral mucosa. The acceptance of CHX mouthwashes by patients and their extended use are restricted by these unfavorable side effects. As a result, efforts to find alternatives are still ongoing, with a change in emphasis toward biogenic agents.[3]

Herbal remedies, which are sourced from plants, have long been used in dentistry to treat pain, calm irritation, suppress bacteria, and reduce inflammation. According to recent reports, a significant number of herbal mouthwashes have shown promise in the management of plaque and gingivitis. Herbal mouthwashes are made using essential oils and extracts from phytotherapeutic plants, and they include a blend of active ingredients such as sterols, tannins, and catechins. The combination of natural ingredients in medicines produced from herbs or plants typically has mild therapeutic effects. Herbal mouthwashes provide extra anti-inflammatory and antioxidant qualities in comparison to synthetic chemical-based antibacterial processes, which may further improve gingival health.[4]

Many herbal mouthwashes have been developed and tested, but the results of the literature that is currently available are conflicting when it comes to the clinical effects of herbal mouthwashes on the control of gingival inflammation and dental plaque when compared to placebo. Additionally, there is a dearth of meta-analytical evidence that highlights the overall effects of herbal mouthwashes as supplements to patients with gingivitis who perform their own daily oral hygiene. It is impossible to give patients and practitioners thorough, evidence-based guidance without this data. Thus, the purpose of this study was to examine the overall effects of herbal mouthwashes as supplements to daily oral hygiene on both plaque and inflammation control by conducting a systematic review and a meta-analysis of randomised controlled trials (RCTs).[5]

Profile of Ingredients:

1. Guava:

Sticks are commonly used in dental care because they are strong, clean, and help keep teeth free of plaque and cavities. Research suggests that tea can also play a role in preventing cavities and plaque buildup. In places like Ghana and Nigeria, people chew tea leaves to ease toothaches. Making a mouthwash from the root bark is recommended for swollen gums, and using a tea leaf gargle can help with oral ulcers, swollen gums, and bleeding gums. These practices underscore the potential benefits of tea in oral hygiene.[6,7]

2. Tulsi:

In certain cultures, using tulsi (*Ocimum sanctum*) as mouthwash is customary. It is thought to possess antibacterial qualities that could aid in the fight against oral microorganisms, lessen foul breath, and advance general oral hygiene. For individualized guidance on dental care, it is imperative to speak with a healthcare provider as there is little scientific evidence to back these claims.[8,9]

3. Pomegranate :

Pomegranate as a mouthwash may offer benefits due to its antimicrobial and anti-inflammatory properties. It could help reduce bacteria, inflammation, and plaque formation, contributing to improved oral hygiene and fresher breath. Dilute fresh pomegranate juice or use commercial options, swish for 30 seconds, and spit out. While promising, more research is needed, and it should complement, not replace, regular oral care practices. Consult your dentist for personalized advice.[10]

4. Neem:

Neem as a mouthwash may offer antibacterial and anti-inflammatory benefits, aiding in oral health and plaque control. Boil neem leaves or use diluted neem oil, swish for 30 seconds, and spit out. While a traditional remedy, scientific evidence is limited, so it's best used alongside regular oral hygiene practices. Consult your dentist for personalized advice.[11]

5. Propolis:

A material derived by bees called propolis has antibacterial and anti-inflammatory properties and could be used as a mouthwash. Dilute the propolis extract, spit it out after 30 seconds of swishing. Although promising, there isn't enough scientific data to support its use, therefore it's best to combine it with routine dental hygiene procedures. See your dentist for more specific guidance.[12]

6. Cranberry:

Cranberry juice might be helpful for keeping our mouths healthy. It contains something called nondialysable material (NDM), which was discovered in a study by the American Dental Association. This NDM can stop certain mouth bacteria from sticking together and causing plaque and gum disease. They found this out by testing it in a lab. Interestingly, NDM isn't just in cranberries; it's also in blueberries, mangos, peaches, plums, and raspberries. However, only blueberries showed some ability to stop bacteria, while the others didn't do much. There's also a small study that tried using cranberry mouthwash, which could be a new way to use cranberry juice for our teeth.[13]

7. Alum:

Mouthwash containing alum have used for a while and have is proven to be beneficial in plaque reduction. A study assessed impact of using a specifically prepared mouth rinse containing alum on the prevention of plaque and gingivitis when done under daily supervision. The findings of this two-week trial show that there is a significant effect on plaque inhibition when using a mouthwash with 0.02 M (molar solution conc) aluminum.[14]

Oil Pulling Therapy:

Oil pulling, an age-old Indian remedy, requires swishing oil (like sesame, sunflower, or coconut) in your mouth for 15-20 minutes before breakfast, believed to promote oral and overall health. Afterwards, you spit out the oil. Additionally, salt water gargling, a traditional and proven technique, remains widely practiced for oral hygiene. Gargling with salt water is simple yet effective, offering benefits for maintaining oral health.

Oil pulling is believed to work by drawing out toxins and bacteria from the mouth, promoting healthier gums and teeth. Some proponents claim it can also whiten teeth and freshen breath. While scientific evidence supporting these claims is limited, many people find oil pulling to be a soothing and refreshing part of their oral care routine. It's important to note that oil pulling should not replace regular brushing and flossing but can complement them as part of a comprehensive oral hygiene regimen. Additionally, it's recommended to spit the oil into a trash can rather than a sink to prevent clogging pipes.[15]

Preparation of Herbal Mouthwash^[16]:

1. Filter the extract through muslin cloth to remove impurities.
2. Evaporate the filtered solution in a porcelain dish at 40°C.
3. Keep the dried residue for making mouthwash.
4. Mix 200 grams of residue with 800 milliliters of distilled water and polyethylene glycol.
5. Evaporate the mixture again to get a concentrated solution.
6. Dilute this concentrate with sterile water to make a 20% solution.
7. Add two teaspoons each of mint and honey for flavor and sweetness.

Stability of Mouthwash:

It was shown by the 28-day stability research that there were no color, odor, or appearance changes in any of the formula components. It demonstrated the physical stability of the dose forms that had been created.

To ascertain whether using mouthwash is safe, the pH was assessed. The pH range of 6.5 to 7.5 is ideal for the development of most bacteria [18].

As a result, the formulation's pH should be outside of the region where bacteria may grow most easily. The herbal mouthwash and the blank both had pH values between 5.87 and 6.00, according to the pH assessment results.

Due to the excipients' acidic qualities, the pH was somewhat lowered throughout the course of the formula's 28-day storage. Still, the pH drop yet falling between the 4.0 and 6.5 recommended range for mouthwash.[17]

Evaluation Parameter of Mouthwash:

We checked the mouthwash to see if it stayed the same over time. We looked at its form, color, smell, and acidity level (pH). If everything stayed the same during storage at room temperature for up to four weeks, we considered the mouthwash stable. We checked it at the start and then again after one, two, three, and four weeks.[17]

1. Formulation: It refers to the ingredients and their proportions in the mouthwash. It evaluates the effectiveness and safety of the product. Ensuring the right balance of ingredients is crucial for achieving desired oral health benefits without causing any adverse effects on oral tissues or overall health.

2. Efficacy: It assesses how well the mouthwash performs its intended functions, such as cleaning teeth, freshening breath, and preventing dental issues like plaque and gingivitis. By measuring its effectiveness in achieving these goals, we can determine the overall quality and suitability of the mouthwash for oral hygiene routines.

3. Safety: It evaluates if the mouthwash is gentle on oral tissues and doesn't cause adverse reactions. It ensures the product's use doesn't lead to discomfort or harm, promoting confidence in its regular use for maintaining oral health without any negative side effects.

4. Taste: It assesses the flavor of the mouthwash, ensuring it's pleasant and encourages regular use. A pleasing taste enhances user experience, promoting compliance with oral hygiene routines and increasing overall satisfaction with the product.

5. Stability: It checks if the mouthwash maintains quality over time, including color, odor, and pH level. It ensures the product remains effective and safe for use throughout its shelf life, providing consistent benefits for oral hygiene.

6. Antibacterial test: To test the antibacterial properties, we examined both the concentrated extract of the plant and the mouthwash made from it. We used a method called the diffusion agar method, similar to what Valgas described. After incubating for 24 hours, we measured the size of the area where bacteria growth was inhibited, specifically targeting *Staphylococcus aureus* and *Streptococcus mutans* bacteria.

7. In vitro antibacterial activity: We tested the antibacterial activity of *Streptococcus mutans* isolates in vitro. The minimal inhibitory concentration (MIC) and zone of inhibition were found using the Agar well diffusion method. Prefabricated blood agar plates were infected with the *S. mutans* strains. After the plates were dried, four wells were created using a 6 mm agar well cutter. A measured amount of prepared mouthwash (20 μ l, 40 μ l, 60 μ l, and 80 μ l) was added to each well. To enable the passive diffusion of herbal mouthwash into the agar culture media, the agar plates were left undisturbed. Following that, the plates were incubated at 37°C for 24 hours. The inhibitory zones was computed in millimeters.[20]

8. Test for microbial growth in formulated mouthwash: To check for bacteria growth in the mouthwash, we used a method called the streak plate method. We spread the mouthwash onto special plates with agar medium and also set up a control. These plates were then put into an incubator and left there for 24 hours at 37°C. After incubation, we looked at the plates to see if any bacteria had grown, comparing them to the control to see if there was any difference.[19]

Conclusion:

The study found that the herbal mouthwash is promising for delivering medicine effectively and at a low cost. More research is needed to understand its long-term effects and side effects. Compared to regular mouthwashes, herbal ones are stronger and have fewer side effects, but may need to be used more often for best results.

Therefore, it's important to educate the public and prescribers about the usage of herbal mouthwashes. Herbal toothpastes have a significant role in both avoiding dental cavities and preserving oral hygiene. The antibacterial capabilities of the polyherbal toothpaste formulation were satisfactorily assessed utilizing a variety of standard metrics. Promising antibacterial activities against both organisms were demonstrated by the extract. When compared to toothpaste that is entirely synthetic, the designed toothpaste could be safer. To demonstrate the toothpaste's safety and effectiveness, more research is necessary.

References:

1. Edris AE. Pharmaceutical and therapeutic potentials of essential oils and their individual volatile constituents: a review. *Phytother Res* 2007; 21(4): 308-23.
2. Bauer AW, Kirby WMM, Sherris JC, Turck M. Antibiotic susceptibility testing by a standardized single disk method. *American J Clin Pathol* 1966; 45:493-496
3. Benjamin SN, Gathece LW, Wagaiyu EG. Knowledge, attitude and use of mouthwash among dental and medical students of the University of Nairobi. *Int. J. Dent. Oral Health*, 2016; 2(4): 01-6.
4. Renuka S, Muralidharan NP. Comparison in benefits of herbal mouthwashes with chlorhexidine mouthwash: A review. *Asian J Pharm Clin Res*, 2017; 10(2): 3-7.
5. Dr. Bhavna jha kukreja and Dr. Vidya dodwad, Herbal mouthwashes- A gift of nature. *International Journal of Pharma and Bio Sciences*, 2012; 3(2): ISSN 0975-6299.
6. Tatiana V. Macfarlane, Michal m. kawewski, Claudia Cunningham, Iain Bovaird, Rochelle Morgan, Kirstin Rhodes, Ray Watkins.
7. O. Shibly, S. Rifai, and J. J. Zambon, "Supragingival dental plaque in the etiology of oral diseases," *Periodontology* 2000, vol. 8, no. 1, pp. 42–59, 1995
8. D. Osso and N. Kanani, "Antiseptic mouth rinses: an update on comparative effectiveness, risks and recommendations," *Journal of Dental Hygiene*, vol. 87, no. 1, pp. 10–18, 2013.
9. P. James, H. V. Worthington, C. Parnell et al., "Chlorhexidine mouthrinse as an adjunctive treatment for gingival health," *Cochrane Database of Systematic Reviews*, vol. 3, Article ID CD008676, 2017.
10. R. Gupta, N. A. Ingle, N. Kaur, P. Yadav, E. Ingle, and Z. Charania, "Ayurveda in dentistry: a review," *Journal of International Oral Health*, vol. 7, no. 8, pp. 141–143, 2015.
11. M. S. Khairnar, B. Pawar, P. P. Marawar, and A. Mani, "Evaluation of *Calendula officinalis* as an anti-plaque and anti- gingivitis agent," *Journal of Indian Society of Periodontology*, vol. 17, no. 6, pp. 741–747, 2013.
12. J. D. Lauten, L. Boyd, M. B. Hanson, D. Lillie, C. Gullion, and T. E. Madden, "A clinical study: Melaleuca, Manuka, Calendula and green tea mouth rinse," *Phytotherapy Research*, vol. 19, no. 11, pp. 951–957, 2005.
13. A. Rohatgi, Web Plot Digitizer, <http://automeris.io/WebPlotDigitizer>.
14. J. Silness and H. Loe, "Periodontal disease in pregnancy II. Correlation between oral hygiene and periodontal condition," *Acta Odontologica Scandinavica*, vol. 22, no. 1, pp. 121–135, 1964.
15. Nagori K, Singh MK, Alexander A, Kumar T, Dewangan D, Badwaik H, Tripathi D. K. L. Piperbettle L: A review on its ethnobotany, phytochemistry, pharmacological profile and profiling by new hyphenated technique DART-MS (direct analysis in real time mass spectrometry) *J Pharm Res*. 2011.

16. Waghmare PF, Chaudhari AU, Karhadkar VM, Jamkhande AS. Comparative evaluation of turmeric and chlorhexidine gluconate mouthwash in prevention of plaque formation and gingivitis: A clinical and microbiological study. *J Contemp Dent Pract.* 2011;12:221–4.

17. Chatterjee A, Saluja M, Singh N, Kandwal A. To evaluate the antigingivitis and antiplaque effect of an *Azadirachta indica* (neem) mouth rinse on plaque induced gingivitis: A double-blind, randomized, controlled trial. *J Indian Soc Periodontol.* 2011;15:398–401.

18. Fardal O, Turnbull RS. A review of the literature on use of chlorhexidine in dentistry. *J Am Dent Assoc.* 1986;112:863–9

19. Mariotti A. Plaque-induced gingival diseases. In: Ni P, Ja L, editors. *Clinical Periodontology and Implant Dentistry.* Iowa: Blackwell Munksgaard; 2008. p. 405-20.

20. Chandrasekaran S, Varghese S. Validity of self-reported periodontal status in patients visiting dental hospital in Chennai-A prospective study. *Int J Sci Res* 2017;6:180-2.

