

Comparative Antimicrobial Efficacy of Herbal and Conventional Intracanal Medicaments: A Systematic Review of Randomized Controlled Trials

Pooja Kesharani¹ , Vyoma Shah¹, Nishtha Patel¹ , Shilpa Shah¹ , Riddhi Bhide² , Deepu Patil³ 

¹College of Dental Sciences and Research Centre, Ahmedabad, India

²PG Student, College of Dental Sciences and Research Centre, Ahmedabad, India

³AME's Dental College, Raichur, Karnataka

*Correspondence author: Riddhi Bhide, PG Student, Department of Conservative Dentistry and Endodontics, College of Dental Science and Research Centre, Bopal, Manipur, Gujarat, India; E-mail: riddhithakkar00168@gmail.com

Citation: Kesharani P, et al. Comparative Antimicrobial Efficacy of Herbal and Conventional Intracanal Medicaments: A Systematic Review of Randomized Controlled Trials. J Dental Health Oral Res. 2026;7(3):1-9.

<https://doi.org/10.46889/JDHOR.2026.7305>

Received Date: 29-07-2026

Accepted Date: 08-09-2026

Published Date: 16-09-2026



Copyright: © 2026 The Authors. Published by Athenaem Scientific Publishers.

This is an open access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY 4.0), which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

License URL:

<https://creativecommons.org/licenses/by/4.0/>

Abstract

Background: Effective elimination of microorganisms from the root canal system is essential for the success of endodontic therapy. Intracanal medicaments play an important role in reducing microbial load during endodontic treatment. Conventional medicaments such as calcium hydroxide are widely used; however, their limited efficacy against certain resistant microorganisms has led to increasing interest in herbal alternatives with antimicrobial properties.

Aim: To compare the antimicrobial efficacy of herbal and conventional intracanal medicaments based on evidence from randomized controlled trials.

Materials and Methods: This systematic review followed PRISMA 2020 guidelines and was registered in the PROSPERO database (CRD420251140477). Electronic searches of PubMed, Scopus, Cochrane Library and EBSCO were conducted for studies published between 2015 and 2025. Randomized controlled trials comparing herbal and conventional intracanal medicaments were included.

Results: Out of 337 identified records, five randomized controlled trials met the inclusion criteria. Herbal agents such as *Azadirachta indica*, triphala, garlic extract, glycyrrhizin, mangosteen extract and asiaticoside demonstrated antimicrobial efficacy comparable to conventional medicaments.

Conclusion: Herbal intracanal medicaments demonstrate promising antimicrobial activity and may serve as potential alternatives to conventional intracanal medicaments. However, further well-designed randomized controlled trials are required to establish definitive clinical recommendations.

Keywords: Antimicrobial Agents; Calcium Hydroxide; Herbal Medicine; Intracanal Medicaments; Randomized Controlled Trials

Introduction

Total eradication of microbes within the root canal system continues to pose a challenge in endodontic treatment. Persistent microbial infection within the complex anatomy of the root canal system remains one of the leading causes of endodontic treatment failure [1]. Microorganisms such as *Enterococcus faecalis* are frequently associated with persistent endodontic infections because of their ability to survive under adverse environmental conditions, penetrate dentinal tubules and resist commonly used antimicrobial agents [2]. Therefore, the use of intracanal medicaments as adjuncts to chemomechanical preparation plays an important role in enhancing microbial elimination during root canal treatment [3].

Calcium hydroxide has traditionally been regarded as the gold standard intracanal medicament because of its high alkalinity and broad antimicrobial activity [4]. Its antibacterial effect is primarily attributed to the release of hydroxyl ions, which damage bacterial cytoplasmic membranes, denature proteins and interfere with bacterial DNA replication [5]. However, several studies have demonstrated that calcium hydroxide may exhibit limited effectiveness against certain resistant microorganisms, particularly *Enterococcus faecalis*, which can survive in alkaline environments and penetrate deep into dentinal tubules [2,6].

In recent years, increasing attention has been directed toward the use of herbal and plant-derived agents in endodontics [7]. These agents contain various biologically active compounds such as flavonoids, alkaloids, tannins and polyphenols that exhibit antimicrobial, anti-inflammatory and antioxidant properties. Several herbal extracts, including *Azadirachta indica* (neem), triphala, garlic extract, glycyrrhizin and mangosteen, have been investigated for their antimicrobial potential against endodontic pathogens [8]. In addition, herbal agents are considered advantageous because of their natural origin, potential biocompatibility and lower risk of adverse effects [6,9].

Despite the growing interest in herbal intracanal medicaments and their demonstrated antimicrobial potential, the existing body of evidence remains limited and fragmented. Most available studies are predominantly *in-vitro* in nature and focus primarily on Aloe vera as the herbal agent, with minimal evaluation of other herbal formulations. Furthermore, *In-vivo* clinical studies are scarce, limiting the translation of laboratory findings into clinical practice. Additionally, there is a lack of comprehensive comparative investigations assessing the antimicrobial efficacy of diverse herbal medicaments in relation to conventional intracanal agents. This restricted evidence base highlights a significant gap in the literature and underscores the need for systematic and well-designed studies incorporating *In-vivo* approach.

Materials and Methods

Study Design and Protocol Registration

The present systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines. The review protocol was prospectively registered in the PROSPERO database (CRD420251140477) to ensure methodological transparency and minimize reporting bias.

Research Question

The research question of this systematic review was formulated according to the PICO framework.

Population (P): Patients undergoing root canal treatment in permanent teeth.

Intervention (I): Herbal intracanal medicaments with antimicrobial properties.

Comparison (C): Conventional intracanal medicaments such as calcium hydroxide or chlorhexidine.

Outcome (O): Reduction in microbial load within the root canal system measured primarily through Colony-Forming Unit (CFU) counts.

Search Strategy

A comprehensive electronic literature search was conducted to identify relevant studies evaluating the antimicrobial efficacy of herbal and conventional intracanal medicaments. The databases searched included PubMed, Scopus, Cochrane Library and EBSCO for articles published between January 2015 and January 2025.

Google Scholar was used as a supplementary source and the first 200 results sorted by relevance were screened to identify additional eligible studies.

The search strategy included combinations of Medical Subject Headings (MeSH) and free-text keywords related to intracanal medicaments and herbal antimicrobial agents. Boolean operators “AND” and “OR” were used to combine the search terms.

Example search strategy used in PubMed:

(“intracanal medicament” OR “root canal medicament”) AND (“herbal” OR “plant extract” OR “phytotherapy”) AND (“calcium hydroxide” OR “chlorhexidine”) AND (“randomized controlled trial”)

The reference lists of selected articles were also manually screened to identify additional relevant studies. The final electronic search was conducted in January 2025. Only articles published in the English language were included in the review.

Eligibility Criteria

Inclusion Criteria

1. Randomized controlled clinical trials
2. Studies conducted on permanent teeth undergoing root canal treatment
3. Studies comparing herbal intracanal medicaments with conventional intracanal medicaments
4. Studies evaluating antimicrobial efficacy through microbiological analysis
5. Studies published in the English language

Exclusion Criteria

1. *In-vitro* or animal studies
2. Case reports and case series
3. Review articles and conference abstracts
4. Studies involving primary teeth
5. Articles without accessible full text

Study Selection

Two independent reviewers screened the titles and abstracts of the retrieved articles. Studies that met the eligibility criteria were selected for full-text evaluation. Any disagreements between reviewers were resolved through discussion or consultation with a third reviewer. The study selection process was documented using a PRISMA 2020 flow diagram illustrating the identification, screening, eligibility and inclusion of studies.

Data Extraction

Relevant data from the included studies were extracted independently by two reviewers. The extracted information included:

- Author and year of publication
- Study design
- Type of herbal and conventional intracanal medicaments used
- Sample size
- Outcome measures
- Main findings

Risk of Bias Assessment

The methodological quality of the included studies was assessed using the Cochrane Risk of Bias (RoB 2.0) tool. The studies were evaluated across domains including randomization process, deviations from intended interventions, missing outcome data, measurement of outcomes and selection of reported results.

Data Synthesis

Due to heterogeneity among the included studies, with respect to medicament types, concentrations and outcome assessment methods, a qualitative synthesis was performed rather than a quantitative meta-analysis.

Results

Study Selection

The study selection process was conducted in accordance with the PRISMA 2020 guidelines and is illustrated in the PRISMA flow diagram (Fig. 1). A total of 337 records were identified through electronic database searching, including PubMed (n = 42), Scopus (n = 96), Cochrane Library (n = 18), EBSCO (n = 21) and Google Scholar (n = 160).

After removal of 87 duplicate records, 250 articles remained for title and abstract screening. During the screening process, 225 records were excluded because they did not meet the eligibility criteria. Subsequently, 25 full-text articles were assessed for eligibility. Among these, 20 studies were excluded for the following reasons: *in-vitro* studies (n = 8), non-randomized clinical studies (n = 6), studies involving primary teeth (n = 2) and insufficient data for analysis (n = 4).

Finally, five randomized controlled trials met the inclusion criteria and were included in the qualitative synthesis.

Characteristics of Included Studies

The included studies comprised randomized controlled trials assessing the efficacy of herbal intracanal medicaments-such as *Azadirachta indica*, Triphala, Garlic extract, Glycyrrhizin, Mangosteen extract and Asiaticoside-in relation to conventional agents, including calcium hydroxide, chlorhexidine gel and Ledermix paste [10].

Sample sizes across the studies ranged from 36 to 240 and were allocated into multiple experimental and control groups based on the medicaments evaluated, with calcium hydroxide serving as the control in most cases. Antimicrobial efficacy was primarily assessed by measuring the reduction in Colony-Forming Units (CFU) of endodontic microorganisms. The characteristics of all five included studies are summarized in Table 1.

Antimicrobial Outcomes

All included studies evaluated the antimicrobial efficacy of intracanal medicaments by assessing the reduction in Colony-Forming Units (CFU) of endodontic microorganisms [11]. Microbiological analysis was commonly performed using culture methods on blood agar plates and bacterial counts were measured before and after application of the intracanal medicaments [12].

Most studies reported a significant reduction in microbial counts following the use of herbal intracanal medicaments. In several studies, herbal agents demonstrated comparable or greater antimicrobial activity when compared with conventional intracanal medicaments such as calcium hydroxide [7,8,13].

For example, triphala and *Azadirachta indica* demonstrated greater reductions in CFU counts compared with conventional medicaments in certain trials. Similarly, mangosteen extract and glycyrrhizin-based medicaments also demonstrated notable antimicrobial activity against endodontic pathogens [14].

However, variations in antimicrobial outcomes were observed across the included studies. Differences in medicament type, concentration, duration of application and microbial assessment methods may have contributed to these variations.

Risk of Bias Assessment

The methodological quality of the included studies was assessed using the Cochrane Risk of Bias (RoB 2.0) tool. Overall, most studies demonstrated a low risk of bias in the randomization process, indicating adequate sequence generation.

However, several studies showed some concerns regarding deviations from intended interventions and outcome measurement. One study demonstrated a high overall risk of bias due to methodological limitations.

Certainty of Evidence

The certainty of evidence for the primary outcomes was evaluated using the GRADE approach and the findings are summarized in Table 2. Although all included studies were randomized controlled trials, the overall certainty of evidence was rated as moderate. The certainty of evidence was downgraded due to moderate heterogeneity in medicament formulations and study protocols, variations in antimicrobial assessment methods, the limited number of included studies and moderate imprecision associated with relatively small sample sizes.

Overall, the findings indicate that herbal intracanal medicaments demonstrate comparable antimicrobial efficacy to conventional agents; however, the strength of evidence is limited by methodological heterogeneity and imprecision [15].

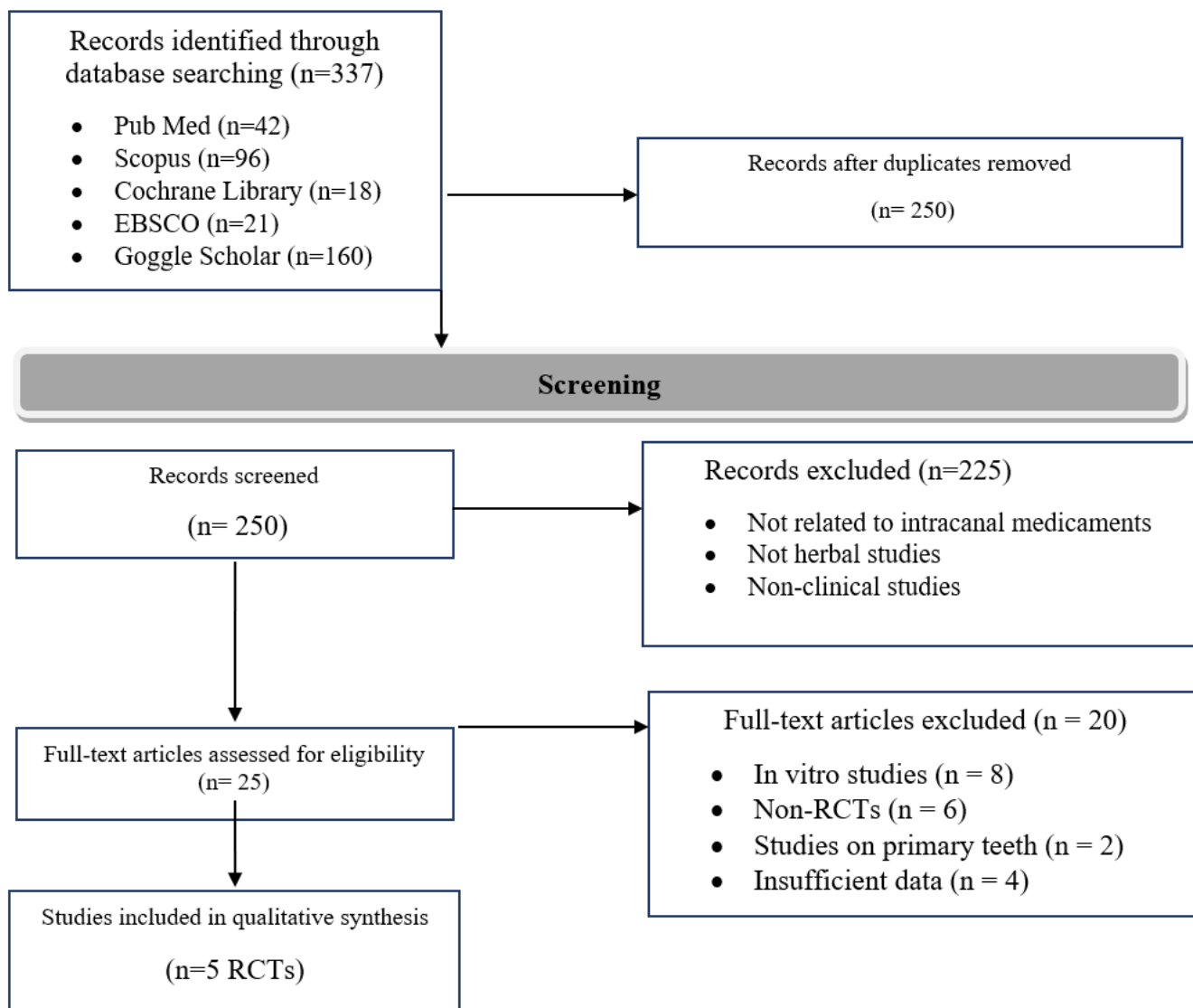


Figure 1: PRISMA flow chart.

Author (Year)	Study Design	Herbal Medicament	Conventional Medicament	Groups	Sample Size	Outcome Measure	Main Findings
Alqahtani, et al., (2025)	Randomized controlled trial	Asiaticoside	Ledermix, Ca(OH) ₂	Ca(OH) ₂ , Ledermix, Asiaticoside	36 (12/group)	CFU count	Ledermix and asiaticoside showed significantly greater antimicrobial activity compared with Ca(OH) ₂ .
Sharma, et al., (2024)	Randomized controlled trial	Triphala, <i>Azadirachta indica</i>	2% CHX gel, Ca(OH) ₂	CHX, <i>A. indica</i> , Triphala, Ca(OH) ₂	40 (10/group)	CFU count, SEM	Herbal medicaments demonstrated greater reduction in bacterial counts

							compared with CHX and Ca(OH) ₂ .
Eltantawi, et al., (2024)	Randomized controlled trial	Glycyrrhizin	Ca(OH) ₂	Ca(OH) ₂ , Ledermix, Glycyrrhizin	36 (12/group)	CFU count	Glycyrrhizin and Ledermix showed greater bacterial reduction compared with Ca(OH) ₂ .
Sharma, et al., (2025)	Randomized controlled trial	Mangosteen, Chitosan, Mangosteen + Chitosan	Ca(OH) ₂	Mangosteen, Chitosan, Mangosteen + Chitosan, Ca(OH) ₂	40 (10/group)	CFU count	Mangosteen–chitosan combination showed the highest antimicrobial activity.
Kishan, et al., (2024)	Randomized controlled trial	<i>Azadirachta indica</i> , Garlic, Triphala	Ca(OH) ₂	<i>A. indica</i> , Garlic, Triphala, Ca(OH) ₂	240 (60/group)	CFU count	Triphala showed significantly greater antimicrobial efficacy compared with garlic and Ca(OH) ₂ .

Table 1: Summary of included randomized controlled trials evaluating herbal and conventional intracanal medicaments.

Outcome	Number of Studies	Study Design	Risk of Bias	Inconsistency	Indirectness	Imprecision	Overall Certainty of Evidence
Reduction in microbial load (CFU count)	5	Randomized controlled trials	Some concerns in several studies	Moderate heterogeneity in medicaments and protocols	Low	Moderate due to small sample sizes	Moderate
Comparative antimicrobial efficacy between herbal and conventional medicaments	5	Randomized controlled trials	Some concerns	Moderate	Low	Moderate	Moderate

Table 2: Grade assessment for certainty of evidence.

Discussion

The present systematic review demonstrated that herbal intracanal medicaments exhibit antimicrobial efficacy comparable to conventional agents across the included randomized controlled trials. This finding underscores the potential of plant-derived

medicaments as effective adjuncts in endodontic disinfection [8,16].

The observed antimicrobial effectiveness of herbal medicaments may be attributed to the presence of bioactive phytochemical constituents, including flavonoids, tannins, alkaloids and phenolic compounds, which exert antibacterial effects through multiple mechanisms such as disruption of bacterial cell membranes, inhibition of enzymatic activity and interference with microbial metabolic pathways [15,17]. In addition, several herbal agents possess anti-biofilm properties, which may enhance their effectiveness against persistent endodontic pathogens, particularly *Enterococcus faecalis* [18].

In the present review, agents such as *Azadirachta indica*, Triphala, garlic extract, glycyrrhizin, mangosteen extract and asiaticoside demonstrated consistent reductions in microbial load [10,19]. These findings are consistent with the observations of Siqueira and Rôças, who highlighted the effectiveness of various antimicrobial strategies against endodontic pathogens, as well as Groppo, et al., who reported significant antibacterial activity of plant extracts. Similarly, Prabhakar, et al., demonstrated the efficacy of Triphala as an intracanal medicament against *Enterococcus faecalis* [7]. The antimicrobial activity of *Azadirachta indica* has been linked to compounds such as nimbidin and azadirachtin, while Triphala exhibits synergistic antibacterial effects due to its polyherbal composition. Mangosteen extract, rich in xanthenes and glycyrrhizin derived from licorice have also been reported to possess significant antimicrobial and anti-biofilm properties [20].

In contrast, although calcium hydroxide remains widely used in clinical practice, its antimicrobial efficacy against resistant microorganisms such as *Enterococcus faecalis* has been reported to be inconsistent [17,18]. Haapasalo and Ørstavik demonstrated the ability of *E. faecalis* to survive in dentinal tubules, while Evans, et al., reported its tolerance to alkaline environments, thereby reducing the effectiveness of calcium hydroxide [3].

Furthermore, Siqueira and Rôças emphasized the persistence of microorganisms even after intracanal medication, highlighting the limitations of conventional medicaments. The findings of the present review, wherein several herbal medicaments demonstrated comparable or superior antimicrobial outcomes, are in agreement with these observations and support the exploration of alternative intracanal agents.

Despite the encouraging antimicrobial results observed with herbal medicaments, variability was noted among the included studies. Differences in herbal medicament composition, concentration, application protocols and microbial assessment methods may have contributed to these variations. Additionally, differences in the duration of intracanal medicament application and microbial sampling techniques may also have influenced the reported outcomes. It is also important to consider that culture-based techniques may underestimate the true microbial diversity within the root canal system [21,22].

Most included studies primarily assessed antimicrobial efficacy using Colony-Forming Unit (CFU) counts, whereas clinically relevant outcomes such as postoperative pain and long-term healing outcomes were not consistently evaluated, thereby limiting the ability to draw definitive clinical conclusions regarding the superiority of herbal intracanal medicaments over conventional agents [23-25]. Furthermore, although the included studies were randomized controlled trials, the overall certainty of evidence was moderate due to variations in study design, sample size and outcome assessment. Differences in geographic settings and patient populations may also affect the generalizability of the findings.

Future research should focus on conducting well-designed randomized controlled clinical trials with larger sample sizes and standardized protocols to establish the clinical effectiveness of herbal intracanal medicaments. Additionally, future investigations should aim to develop standardized formulations and delivery systems to improve consistency and clinical applicability.

Clinical Significance

Herbal intracanal medicaments may serve as biocompatible adjuncts in endodontic therapy, offering potential advantages in terms of reduced cytotoxicity and improved patient acceptability. Their use may be particularly relevant in cases requiring enhanced biological compatibility.

Conclusion

Within the limitations of this systematic review, herbal intracanal medicaments show encouraging antimicrobial potential and may serve as biologically favorable alternatives or adjuncts in endodontic therapy. Nevertheless, the limited and heterogeneous clinical evidence necessitates further high-quality randomized controlled trials with standardized protocols and clinically relevant outcomes to support their routine use.

Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Funding Statement

This research did not receive any specific grant from funding agencies in the public, commercial or non-profit sectors.

Acknowledgement

The authors have no acknowledgments to declare.

Data Availability Statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Ethical Statement

The project did not meet the definition of human subject research under the preview of the IRB according to federal regulations and therefore was exempt.

Informed Consent Statement

Not applicable.

Authors' Contributions

All authors contributed equally to this paper.

References

1. Palwankar D, Garg A, Tandan M, Bhasin P, Sachdeva A, Palwankar P. Antimicrobial efficacy of two commercially available herbal products with and without ultrasonic activation in primary endodontic infections: A randomized clinical trial. *J Conserv Dent Endod*. 2024;27(3):305-9.
2. Sathorn C, Parashos P, Messer H. Antibacterial efficacy of calcium hydroxide intracanal dressing: a systematic review. *Int Endod J*. 2007;40(1):2-10.
3. Mohammadi Z, Abbott PV. The properties and applications of calcium hydroxide in endodontics. *Int Endod J*. 2009;42(4):288-302.
4. Prabhakar J, Senthilkumar M, Priya MS, Mahalakshmi K, Sehgal PK, Sukumaran VG. Evaluation of antimicrobial efficacy of herbal alternatives (Triphala and green tea) against *Enterococcus faecalis*. *J Endod*. 2010;36(1):83-6.
5. Groppo FC, Ramacciato JC, Simões RP, Florio FM, Sartoratto A. Antimicrobial activity of garlic, tea tree oil and chlorhexidine. *Braz J Infect Dis*. 2002;6(6):317-21.
6. Podar R, Kulkarni GP, Dadu SS, Singh S, Singh SH. *In-vivo* antimicrobial efficacy of *Azadirachta indica* as an intracanal medicament. *Eur J Dent*. 2015;9(4):529-34.
7. Sharma L, Sinha DJ, Puri N, Dhawan A, Prakash P, Sharif N. Antimicrobial efficacy of 2% chlorhexidine gel, Triphala and *Azadirachta indica* as intracanal medicaments against *Enterococcus faecalis*: a randomized clinical trial. *J Conserv Dent Endod*. 2024;27(10):1004-9.
8. Eltantawi AR, Abdel-Razik GM, Elhawary YM, Badr AE. Efficacy of glycyrrhizin as an intracanal medicament on bacterial load reduction in primary infected root canals: a randomized clinical trial. *J Contemp Dent Pract*. 2024;25(6):540-546.
9. Kishan KV, Shah N, Mamatha KV, Sreekumari L, Parikh M. A randomized clinical comparative evaluation of interappointment flare-ups on placing *Azadirachta indica*, garlic, Triphala and calcium hydroxide as intracanal medicament in primary endodontic lesion. *J Conserv Dent Endod*. 2025;28(2):155-60.

10. Sharma L, Sinha DJ, Paul R, Singh S, Deb A, Pandey J. Antimicrobial efficacy of mangosteen, chitosan and their combination as intracanal medicaments against *Enterococcus faecalis*: a randomized controlled clinical trial. J Conserv Dent Endod. 2025;28(7):663-668.
11. Alqahtani S, Elhawary Y, Badr A. Efficacy of asiaticoside as an intracanal medicament on bacterial load reduction in primary infected root canals: a randomized clinical trial. Egypt Dent J. 2025; 71:2631.
12. Kumar A, Prasad M, Singh S. Role of herbal medicaments in endodontics: a review. J Clin Diagn Res. 2015;9(6): ZE01-5.
13. Shrestha A, Kishen A. Antibacterial nanoparticles in endodontics: a review. J Endod. 2016;42(10):1417-26.
14. Chandwani ND, Maurya N, Nikhade P, Chandwani J. Comparative evaluation of antimicrobial efficacy of calcium hydroxide, triple antibiotic paste and bromelain against *Enterococcus faecalis*: An *in-vitro* study. J Conserv Dent Endod. 2022;25(1):63-7.
15. Agnihotri A. Herbal irrigants in endodontics: a scoping review. J Conserv Dent. 2022;25(2):103-10.
16. Bhavani DG. Antimicrobial effectiveness of propolis, Triphala and Aloe vera against endodontic pathogens. Cureus. 2023;15:e41628.
17. Setia R. Smear layer removal efficacy of herbal irrigants: SEM analysis. Contemp Clin Dent. 2023;14(2):128-34.
18. Mukherjee M. Efficacy of herbal irrigants in root canal disinfection. Cureus. 2023;15:e40467.
19. Rangareddy MS, P. SP, Karteeek BS. A comparative evaluation of antimicrobial efficacy of various intracanal medicaments (curcuma longa, honey, nitrofurantoin and calcium hydroxide) on *Enterococcus faecalis*: An *in-vitro* study. Journal of Pharmacology and Pharmacotherapeutics. 2024;15(1):19-27.
20. Mohanty S, Nanda S, Das AC, Sahoo NR, Sahany SK, Panda S et al, Assessment of Antimicrobial efficacy of triphala, neem and chlorhexidine root canal irrigants. J Pharm Bioallied Sci. 2024;16(3):S2176-8.
21. Akhanda MH, Siddiqua F, Jahan D, Ahmed I, Hossain MZ, Ahmed A, et al. Pharmacological action of different herbal endodontic irrigants and their efficacy: a review. J Popul Ther Clin Pharmacol. 2024;31(8):1332-45.
22. Ayub S, et al. Recent advances in intracanal medicaments used in dentistry. J Health Sci Med Res. 2025;43(3):e20241129.
23. Chavan P, Dimple P, Takate V. Comparative effectiveness of triphala and conventional root canal irrigants in primary teeth: A systematic review. Cureus. 2025;17(12):e98788
24. Sharvil S, Dinesh R, Sunil P. Current concepts and advances in intracanal medicaments: a comprehensive review. Int J Dent Sci Res. 2025;7(3):43-7.
25. Siddique R, Sureshbabu NM, Somasundaram J, Jacob B, Selvam D. Qualitative and quantitative analysis of precipitate formation following interaction of chlorhexidine with sodium hypochlorite, neem and tulsi. 2019;22(1):40-7.

About the journal



Journal of Dental Health and Oral Research is an international, peer-reviewed, open-access journal published by Athenaeum Scientific Publishers. The journal publishes original research articles, case reports, editorials, reviews and commentaries relevant to its scope. It aims to disseminate high-quality scholarly work that contributes to research, clinical practice and academic knowledge in the field.

All submissions are evaluated through a structured peer-review process in accordance with established editorial and ethical standards. Manuscripts are submitted and processed through the journal's online submission system.

Manuscript submission: <https://athenaeumpub.com/submit-manuscript/>