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Systematic Review

Herbal Medicine in Brazilian Dentistry: A Systematic Review of SciELO (2019 - 2025)

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Abstract

Objective: To synthesize evidence on the use of herbal therapies in Dentistry indexed in SciELO (2019 - 2025).

Methods: PRISMA-based systematic review; SciELO search (2019 - 2025) combining phytotherapy terms with dentistry-related descriptors. Eligibility: *in vitro*, *in vivo*, and clinical dental studies involving herbal products.

Results: Seven studies were included (1 randomized clinical trial, 1 nonrandomized clinical study, 3 animal experiments, 2 *in vitro*). Findings suggest benefits of *Pistacia eurycarpa* extract on alveolar bone loss, eucalyptus and *Calendula officinalis* gels for oral mucositis, and honey-lemon spray for recurrent aphthous stomatitis; propolis derivatives showed antimicrobial/modulatory effects.

Conclusion: Evidence is promising for selected indications, but methodological heterogeneity and few clinical trials remain. Controlled trials and extract standardization are needed.

Keywords: *Phytotherapy; Medicine Herbal; Vegetal extract; Dentistry; Systematic Review*

Introduction

Herbal medicine, defined as the therapeutic use of medicinal plants and their derivatives, has been used for centuries in different medical traditions[1,2]. Approximately 25% of current drugs are obtained directly from plants and up to 40% are derived from natural products[1-4]. The World Health Organization officially recognized phytotherapy in the 1970s[5], and in Brazil, its use was regulated in 2006 by the National Policy on Integrative and Complementary Practices[6]. In Brazilian Dentistry, the Federal Council of Dentistry authorized the incorporation of phytotherapy in 2008 as a complementary approach to oral care[7].

Several plant species have been studied for oral health purposes, including *Syzygium aromaticum* (clove), *Punica granatum* (pomegranate), *Malva sylvestris* (mallow) and *Matricaria chamomilla* (chamomile), with reported antimicrobial, anti-inflammatory and analgesic effects relevant to conditions such as caries, gingivitis, periodontitis and recurrent aphthous stomatitis[8-11]. Other formulations, such as those containing *Mentha piperita* and *Citrus limon*, demonstrated antifungal activity against Candida albicans, supporting their role in oral candidiasis management[11].

Herbal preparations have been attributed antiseptic, antimicrobial, anti-inflammatory and analgesic properties, which justify their potential integration into clinical dental practice[12]. Nevertheless, barriers such as lack of knowledge, limited dissemination of scientific evidence and institutional resistance still hinder their widespread adoption[13,14]. These factors contribute to a gap between the availability of herbal resources and their clinical application by dental professionals.

Recent reviews have reinforced the relevance of phytotherapy as a complementary therapeutic option in Dentistry, highlighting its potential safety, accessibility and low cost[15,16]. Plants such as *Aloe vera*, *Calendula officinalis* and *Cymbopogon citratus* have been investigated for their anti-inflammatory, healing and antifungal effects, showing promise in periodontal, endodontic and mucositis management[17,18]. Such findings emphasize the need to consolidate herbal medicine as an evidence-based adjunct in oral healthcare.

Given the growing scientific production on phytotherapy applied to Dentistry, it is necessary to critically synthesize the available evidence in relevant databases. The Scientific Eletronic Library Online - SciELO collection provides important access to Latin American studies (https://scielo.org/en). This systematic review aimed to map and analyze SciELO-indexed studies published between 2019 and 2025 on the use of herbal medicines in dentistry, identifying their main outcomes, methodological limitations and perspectives for clinical application.

Methods

Protocol: Systematic review conducted in accordance with PRISMA guidelines. Database: SciELO (2019 - 2025).

Search strategy: ("fitoterapia" OR "plantas medicinais" OR "extrato vegetal" OR própolis OR mel OR calendula OR eucalipto) AND (odontologia OR dental OR oral OR dent*).

Eligibility: In vitro, in vivo, and clinical studies related to dentistry. Excluded: reviews, ethnographic reports, editorials.

Data extraction: Design, sample, herbal product, dose/formulation, dental indication, comparators, outcomes, main findings.

Risk of Bias: RoB 2 for clinical trials; adapted checklist for preclinical/*in vitro* studies.

Results

Search results: 126 records retrieved; after screening and eligibility, 7 studies included.

Included studies: 1 randomized clinical trial (honey-lemon spray for recurrent aphthous stomatitis), 1 nonrandomized clinical study (eucalyptus and Calendula gel for oral mucositis), 3 animal studies (e.g., *Pistacia eurycarpa* in periodontitis), 2 in vitro studies (propolis derivatives in endodontic/bonding contexts).

Table 1. Main characteristics of the selected studies.

Journal	Year	Herbal product	Dental context	Findings	Design
J Appl Oral Sci[19]	2024	Pistacia eurycarpa	Periodontitis in rats	Reduced alveolar bone loss	Animal
Braz Dent J20	2020	Eucalyptus 2% gel; Calendula offici-nalis	Oral mucositis (hamsters)	Histological improvement	Animal
Braz J Oral Sci[21]	2023	Honey-lemon spray	Recurrent aphthous stomatitis	Reduced pain and ulcer area	RCT
J Appl Oral Sci[22]	2024	Propolis + MTA	Inflamed pulp cells	Reduced MMP-2 expression	*In vitro*
Braz J Oral Sci.[23]	2024	CAPE (propolis derivative)	Dentin matrix	Maintained mechanical properties	*In vitro*
Braz J Oral Sci.[24]	2020	Herbal irrigants	Endodontics	Antibacterial and smear layer removal	*In vitro*

Discussion

The included studies[19-25] suggest beneficial effects of herbal therapies in Dentistry. Clinical evidence[21] supports honey-lemon spray in recurrent aphthous stomatitis and eucalyptus/Calendula gel in oral mucositis. Preclinical evidence[19,20] highlights anti-inflammatory and reparative actions of *Pistacia eurycarpa* in periodontitis. Propolis derivatives demonstrated antimicrobial and modulatory potential in vitro[22]. Despite these findings, methodological heterogeneity and limited sample sizes limit clinical generalization. Further well-designed randomized controlled trials are warranted (Figure 1). The results of this systematic review show that, although herbal remedies show promising effects in different dental contexts, such as experimental periodontitis, oral mucositis, and aphthous stomatitis, the methodological robustness of the studies remains limited. Much of the research found corresponds to preclinical or laboratory research, which, while useful for elucidating mechanisms of action, does not allow for immediate extrapolation to clinical practice. This limitation reinforces the need for more controlled and well-designed clinical trials capable of establishing solid evidence on efficacy, safety, and cost-effectiveness.

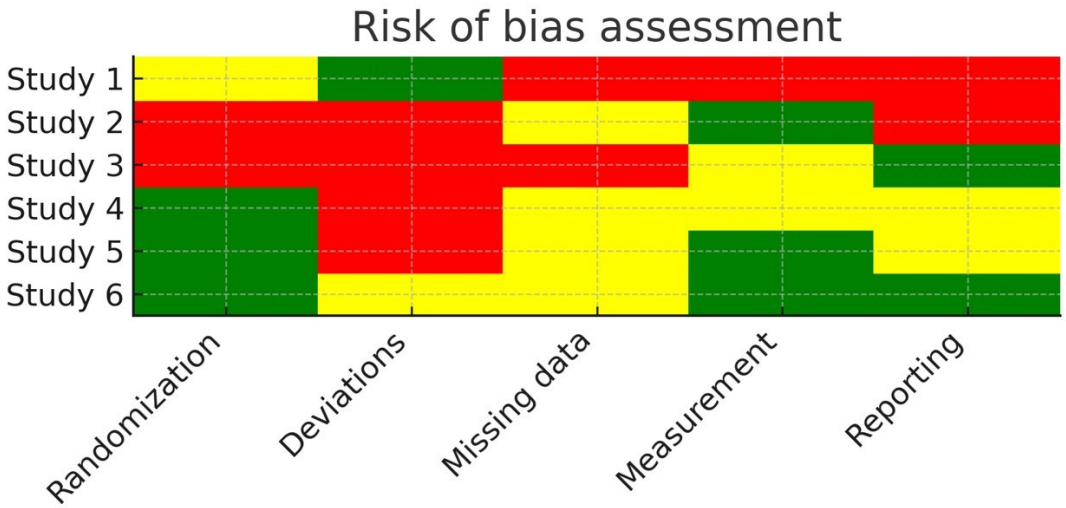

Figure 1. *Risk of bias traffic-light plot across included studies.*

The present review demonstrates promising but still limited evidence regarding the use of herbal therapies in Dentistry. The included studies suggest beneficial effects of phytotherapy in different oral conditions, such as experimental periodontitis, oral mucositis, and recurrent aphthous stomatitis. These findings are consistent with international reviews reporting anti-inflammatory, antibacterial, antifungal, and antioxidant properties of plants such as turmeric, aloe vera, pomegranate, green tea, and clove, which are potentially useful in periodontal disease management[18,24]. However, most studies remain preclinical or in vitro, which restricts the immediate extrapolation of their results to clinical practice[21,25]. This limitation underscores the urgent need for well-designed randomized controlled trials to establish robust evidence on efficacy, safety, and cost-effectiveness[19,26].

Another critical challenge is the heterogeneity of herbal products. Studies used diverse pharmaceutical forms (gels, rinses, sprays, extracts) and concentrations, making comparisons difficult. In addition, the lack of phytochemical standardization compromises reproducibility[22]. Recent reviews emphasize that variations in preparation methods, dosage, and exposure time significantly influence outcomes[25,27]. These findings reinforce the need for joint efforts among researchers, regulatory agencies, and the pharmaceutical industry to ensure standardized and reliable formulations.

Despite the encouraging data, the clinical adoption of phytotherapy by dental professionals remains modest. Some plant-derived compounds demonstrated antibacterial activity against *Streptococcus mutans* comparable to chlorhexidine[28], yet less than 40% of dentists report using phytotherapy, and only about one-third prescribe it formally[29]. Moreover, limited knowledge about potential risks, drug interactions, and adverse effects may compromise patient safety, particularly among elderly patients with polypharmacy[14,29]. These barriers highlight the importance of incorporating phytotherapy into undergraduate curricula and continuing education programs in Dentistry.

From a public health perspective, phytotherapy offers additional advantages, including affordability and accessibility. Systematic reviews have shown that herbal mouthwashes can improve oral health-related quality of life, representing a viable therapeutic strategy in populations with limited access to dental care[30]. This emphasizes the relevance of phytotherapy not only as an adjunct in clinical practice but also as a cost-effective and equitable tool for oral health promotion.

Finally, emerging applications expand the scope of phytotherapy in Dentistry. Recent *in vitro* evidence demonstrated that green tea and *Morinda citrifolia* extracts can serve as effective storage media for avulsed teeth, preserving periodontal ligament cell viability[31]. Such innovative findings point toward new frontiers of application; however, their translation into clinical practice requires multicenter trials, standardized formulations, and integration of herbal therapies into evidence-based clinical guidelines[26,30].

Conclusion

Herbal therapies show promising benefits in dentistry, particularly in oral mucosal conditions and as adjuvants in endodontic/bonding materials. Robust clinical trials and phytochemical standardization are necessary for integration into routine practice.

Conflict of Interest

The authors declare that there is no conflict of interest.

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