

A Critical Review of Management and Treatment of Dental Peri-Implantitis Through Antimicrobial Properties of Propolis

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Structured Abstract

Background: Dental peri-implantitis is a chronic inflammatory disease of the dental implant surrounding tissues, frequently leading to bone loss and implant failure. The worldwide growing dependence on dental implants is matched by increasing incidences of peri-implantitis, with prevalence rates varying from 10% to 47%, especially in patients with previous periodontal disease or systemic risk factors. Existing treatment modalities like mechanical debridement, antibiotics, and surgery are frequently ineffective at eliminating oral biofilms or curing inflammation, while adding to extended treatment times and increased expenses. Given these drawbacks, natural options like propolis, a resinous mixture made by bees, have attracted interest given their multifunctional therapeutic promise.

Methods: This paper takes a critical research review methodology by systematically reviewing published literature on the antimicrobial, anti-inflammatory, and regenerative properties of propolis, specifically its use in dental peri-implantitis treatment. The review assesses *in vitro* and *in vivo* research on propolis composition, mechanism of action, and its prospects in biofilm disruption, cytokine modulation, and tissue healing. The sources were chosen by recency, relevance, and quality of experiments.

Results: There is evidence that propolis has bioactive compounds like flavonoids, phenolic acids, and Caffeic Acid Phenethyl Ester (CAPE) that are potent inhibitors of *P. gingivalis* and *A. actinomycetemcomitans*. Propolis also regulates pro-inflammatory mediators and induces osteoblast proliferation. Clinical applicability of these effects is hindered by the absence of standardized preparations, lack of well-defined dosage regimens, and chemical composition variability.

Conclusion: Propolis has great potential as an adjunctive treatment for peri-implantitis with its antimicrobial, anti-inflammatory, and regenerative properties. It can potentially decrease implant-related complications and treatment expenses. Additional clinical trials are needed to determine standardized applications for effective and safe incorporation into implant treatment.

Keywords: Propolis, Dental Implants, Dental peri-implantitis, Natural Antimicrobials, Biofilm Disruption

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