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General Properties of Herbal Medicines and Modern Approaches to the Treatment and Prevention of Periodontitis Using Herbal Preparations

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Abstract: This study analyzes modern approaches to using herbal preparations in the treatment and prevention of periodontitis. It provides insights into the advantages of phytotherapy, including antimicrobial, anti-inflammatory, and regenerative properties. Additionally, the study examines the chemical composition and effectiveness of medicinal plants such as Polygonum hydropiper and Urtica dioica in periodontal disease management.

Keywords: periodontitis, phytotherapy, medicinal plants, herbal preparations, dentistry, anti-inflammatory agents.

Introduction. Periodontal diseases represent a significant global health concern, affecting a large portion of the population.[1] According to the World Health Organization (WHO), the prevalence of periodontal tissue inflammation ranges between 65-98% among individuals aged 35-44 and 55-89% in those aged 15-19. These conditions, if left untreated, can lead to severe oral health issues, including tooth loss and systemic health complications such as cardiovascular diseases and diabetes. [2]

The pathogenesis of periodontitis is multifactorial, with microbial biofilms playing a crucial role. The conventional treatment methods include mechanical plaque removal, antimicrobial agents, and surgical interventions.[6] However, these approaches are often associated with limitations such as antibiotic resistance, adverse side effects, and high costs.[3] Consequently, there has been an increasing interest in alternative therapies, particularly phytotherapy, which offers a natural, cost-effective, and biologically active approach to managing periodontal diseases.[4]

Herbal medicine has been traditionally used in many cultures for oral health management. Various medicinal plants contain bioactive compounds with antimicrobial, anti-inflammatory, and regenerative properties that can effectively aid in periodontal therapy.[5] This study aims to explore the potential of herbal preparations in periodontal treatment, focusing on their biological activities, chemical composition, and effectiveness in managing periodontal conditions.

Methods. This study involved an extensive literature review of scientific articles, clinical trials, and pharmacological analyses of medicinal plants used in periodontitis treatment. Various herbal formulations, including infusions, extracts, tinctures, gels, and powders, were evaluated based on their bioactive components and therapeutic efficacy.

Results

Phytotherapeutic Agents in Periodontitis Management

Several medicinal plants have been identified for their beneficial effects in treating periodontal diseases:

- *Polygonum hydropiper (Water Pepper)*: Contains flavonoids, resins, tannins, and essential oils, exhibiting anti-inflammatory, astringent, and hemostatic properties. Traditionally used for wound healing and pain relief, its active compounds contribute to periodontal tissue regeneration.
- *Urtica dioica (Stinging Nettle)*: Rich in vitamins, flavonoids, tannins, and essential minerals, it possesses antimicrobial and anti-inflammatory effects. It has been used in traditional medicine for treating gum disease, enhancing immune response, and promoting tissue repair.
- *Calendula officinalis (Marigold)*: Contains carotenoids, flavonoids, and phenolic acids, which support epithelial regeneration and reduce inflammation in periodontal tissues.
- *Capsella bursa-pastoris (Shepherd's Purse)*: Recognized for its hemostatic and antibacterial properties, this plant aids in the prevention of bacterial infections in periodontal pockets.

Herbal-Based Commercial Preparations

Modern dentistry incorporates herbal-based products to enhance treatment outcomes. Examples include:

- Stomatofit: A combination of seven medicinal plants, including chamomile and oak bark, effective in reducing inflammation, gum bleeding, and bad breath.
- Asepta Gel: Contains 10% propolis extract, known for its strong antimicrobial and regenerative properties, accelerating the healing of periodontal tissues.

Discussion. Herbal medicine offers several advantages over conventional therapies for periodontitis treatment:

- **Multifunctional effects:** Herbal compounds exhibit antiseptic, analgesic, antimicrobial, and regenerative properties.
- **Low toxicity and minimal side effects:** Unlike synthetic drugs, herbal treatments are less likely to cause allergic reactions or microbial resistance.
- **Enhanced patient compliance:** Pleasant organoleptic properties make herbal treatments more acceptable for long-term use.

Herbal preparations have been shown to be effective in reducing inflammation, promoting tissue regeneration, and preventing bacterial growth in periodontal disease. Studies have highlighted that active compounds in plants such as flavonoids, tannins, and essential oils can significantly contribute to the reduction of gum bleeding, plaque accumulation, and pocket depth in patients with periodontitis.

Despite these advantages, further research is needed to standardize herbal preparations, optimize dosages, and conduct large-scale clinical trials. While many studies support the effectiveness of phytotherapy, variations in plant compositions, extraction methods, and administration techniques can lead to inconsistent results. Establishing standardized protocols for the use of herbal medicine in periodontology will help integrate these treatments into mainstream dental care.

Additionally, integrating herbal medicine with conventional periodontal therapy may yield better treatment outcomes. Combination therapies that utilize both phytotherapeutic agents and conventional antimicrobial treatments could enhance the overall effectiveness of periodontitis management. Future studies should focus on evaluating the long-term impact of herbal treatments, their interactions with synthetic drugs, and their role in personalized periodontal care.

Conclusion. Phytotherapy is an emerging approach in periodontics, providing effective, safe, and natural alternatives for treating and preventing periodontitis. While herbal-based products

demonstrate promising results, more research is required to establish standardized treatment protocols. Future advancements in herbal pharmacology could revolutionize periodontal care, making it more holistic and patient-friendly.

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