



## Review Article

### HERBAL REMEDIES IN PERIODONTICS

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#### ARTICLE INFO

##### Article History:

Received 24<sup>th</sup> November, 2015  
Received in revised form  
26<sup>th</sup> December, 2015  
Accepted 14<sup>th</sup> January, 2016  
Published online 28<sup>th</sup> February 2016

##### Keywords:

Plant Products,  
Gingivitis,  
Periodontitis,  
Microorganisms.

#### ABSTRACT

Dental diseases if left unchecked can lead to major health problems, on the other side periodontal diseases are recognized as a major public health problem throughout the world and is the most common cause of tooth loss in adults. Plant products are recently introduced herbal formulations that are more beneficial than the conventional therapies. There are number of traditional herbal remedies for the treatment and management of diseases related to teeth, gum and oral hygiene. The aim of the present article is to present overall view of the current strategies adopted for the formulation and application of traditional herbal remedies. This article summarizes the current data on the effect of natural herbs on management of various periodontal diseases together with their biological activities.

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#### INTRODUCTION

Gingivitis is the inflammation of the gingiva. Plaque is a requirement for the development of gingivitis (Informational Paper, 1999). Periodontitis is a polymicrobial disease in which disease expression involves intricate interactions of the plaque biofilm with the host inflammatory response and subsequent alterations in bone and connective tissue metabolism (Kornman, 2008). Mechanical plaque control methods are efficient in maintaining adequate levels of oral hygiene, studies have shown that patient compliance in following these methods are not adequate in a large population (Somu et al., 2012). In order to overcome the shortcomings of mechanical plaque control methods, various chemotherapeutic agents have been employed (Somu et al., 2012). Herbs have various bioactive components which possess enormous medicinal value with least side effects (Sangeetha and Vijayalakshmi, 2011). Synthetic antimicrobial agents and antibiotics are known to cause antimicrobial resistance, emergence of previously uncommon infections probably due to the inappropriate or widespread overuse of antimicrobials. Natural phytochemicals have proven to be good alternatives to such synthetic agents (Abdollahzadeh et al., 2011).

Various studies have proven to show excellent medicinal properties of different herbal products in various medical and dental diseases. This review list outs various herbal products, their medicinal properties and their uses in the field of periodontics.

##### Punica granatum (Pomegranate)

Investigators noted that pomegranate's active components, including polyphenolic flavonoids are believed to prevent gingivitis through a number of mechanisms including reduction of oxidative stress in the oral cavity (Reddy et al., 2010), direct antioxidant activity; anti-inflammatory effects (Piramal et al., 2008); antibacterial activity (De Oliveira et al., 2007); and direct removal of plaque from the teeth (De Oliveira et al., 2007).

##### Green tea

Polyphenols found in tea are mostly flavonoids and catechins (Sumpio et al., 2006). Green tea catechin showed a bactericidal effect against black-pigmented, Gram negative anaerobic rods, Porphyromonas gingivalis and Prevotella species, and the combined use of mechanical treatment and the application of green tea catechin using a slow-release local delivery system was effective in improving the periodontal status (Hirasawa et al., 2002).

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**Azadirachata indica (Neem)**

Neem shows antiulcer, anti-inflammatory, anti-fungal, antibacterial, anti-viral, anti-carcinogenic, antiarrhythmic, antiviral, antioxidant, antidiabetic activity (Biswas *et al.*, 2002). In a clinical study, 50 patients with confirmed gingivitis were selected, 40 showed severe bleeding and pustular discharges from the gums. After just three weeks of brushing twice a day with paste including neem leaf extracts, eight out of ten patients showed significant improvement. The patients also showed a reduction in bacterial populations and elimination of halitosis with no side effects (<http://www.neemamerica.com/research.asp>).

**Curcuma longa (Turmeric)**

Turmeric has anti-microbial, anti-oxidant, anti-inflammatory astringent, anti-septic and analgesic properties. (Lee *et al.*, 2011) A study concluded that chlorhexidine gluconate as well as turmeric mouthwash can be effectively used as an adjunct to mechanical plaque control methods in prevention of plaque and gingivitis.

Reduction in total microbial count was observed in both the groups. It is reported that the local drug delivery system containing 2% whole turmeric gel can be used as an adjunct to scaling and root planning (Behal *et al.*, 2011).

**Aloe barbadensis (Aloe vera)**

The aloe leaves contains enzymes, vitamins, minerals, salicylic acids, sugars, lignin, saponins, and amino acids (Hamman, 2008). Various medicinal properties of Aloe vera include positive effects on wound-healing, anti-viral property, anti-tumor effect, anti-inflammatory effects, anti-bacterial property, anti-fungal property, anti-oxidant property and immunomodulating effects (Lee *et al.*, 2004). In a clinical study aloe vera mouth rinse showed significant reduction of gingivitis and accumulation of plaque (Aggarwal *et al.*, 2007).

**Acacia catechu Wild (AC)**

The extracts of AC have been reported to have various pharmacological effects like antipyretic, antiinflammatory, anti diarrhoeal, hypoglycaemic, hepatoprotective, antioxidant and antimicrobial activities (Singh and Lal, 2006; Qadry *et al.*, 2008). The powders of menthol and camphor were used as a flavouring agent. A clinical study on this dentifrice herbal tooth powder reported 87-95%, 70-72% and 80-95% reductions in plaque, gingivitis and dental calculus respectively, about 15 days of treatment (Ernst, 2000).

**Tulsi (Ocimum sanctum)**

Tulsi contains Vitamin A and C, calcium, zinc and iron. It also has chlorophyll and many other phytonutrients with several medicinal properties like expectorant, analgesic, anticancer, antiasthmatic, antiemetic, diaphoretic, anti-diabetic, antifertility, hepatoprotective, hypotensive, hypolipidimic and antistress. Tulsi has also been used in treatment of fever, bronchitis, arthritis, convulsions etc (Rai, 2002). Its anti-inflammatory property makes it a suitable remedy for gingivitis and periodontitis, and it can be used for massaging the gingiva in these conditions (Sen, 1993).

**Psidium guajava (Guava)**

The leaves of guava contain an essential oil rich in cineol, tannins, triterpenes, flavonoids, resin, eugenol, malic acid, fat, cellulose, chlorophyll, mineral salts, and a number of other fixed substances (Narayana *et al.*, 2001). The active flavonoid compound guaijaverin has high potential antiplaque activity by inhibiting the growth of *S. mutans* (Abdelrahim *et al.*, 2002) and *S. aureus* in a study carried out by disc diffusion method (Gnan and Demello, 1999).

**Salvadora persica (Meswak)**

Benzyl isothiocyanate, a major component of *Salvadora persica*, exhibited bactericidal effect against oral pathogens involved in periodontal disease (Sofrata *et al.*, 2011). It is known to have anti-bacterial, anti-fungal, anti-plaque and anti- caries activity (Parveen Dahiya *et al.*, 2012). Al-Lafi and Ababneh reported that the use of miswak inhibits the formation of dental plaque chemically and also exerts antimicrobial effect against many microorganisms (Gazi *et al.*, 1990).

**Cymbopogon Citratus (Lemon grass)**

The active ingredients present in this grass are Citronellol Geraniol which is responsible for its anti-bacterial, astringent, anti-fungal, anti-oxidant, anti-septic, anti-inflammatory properties (Anonymous, 1950). In an in vitro study it has been demonstrated that the essential oil in lemon grass has significant anti-microbial potential against oral microorganisms *S. mutans*, *P. intermedia* and *P. gingivalis* (Ruchika ghoyal and Meena k Anand, 2013).

**Allium sativum (Garlic)**

Allicin, one of the chief phytochemical components has a variety of antimicrobial activities against a wide range of Gram-negative and Gram positive bacteria including *Klebsiella*, pneumonia, *Escherichia*, *Lactobacilli*, *Helicobacter pylori*, *Pseudomonas aeruginosa* and *Mycobacterium tuberculosis* and anti-fungal activity, particularly against *Candida albicans*, antiparasitic activity and antiviral activity (Prevention Methods and Programmes for Oral Health, 1984).

**Eucalyptus globulus (Eucalyptus)**

Studies by Nagata *et al* concluded that eucalyptus extract chewing gum may promote periodontal health by having a meaningful effect on plaque, gingivitis, and bleeding on probing indices in human clinical trials (Nagata *et al.*, 2008). The antibacterial activity of eucalyptus extract against several periodontopathic bacteria including *P. gingivalis* and *P. intermedia* has been documented (Nagata *et al.*, 2006).

**Mango (Magnifera indica)**

Mango leaf contains ascorbic and phenolic acids which are known to possess antibacterial properties. Studies have shown that mango leaves (*magnifera indica*) possess antibacterial properties against anaerobic dental microflora such as *P. intermedia* and *P. gingivalis* and can effectively be used as adjunct for maintenance of oral hygiene. (Indira Bairy, 2002)

**Conclusion**

Pharmacologically active phytochemicals useful for the prevention, treatment and maintenance of periodontal diseases

have been widely acknowledged. Over the last decade, herbal and ayurvedic drugs have become a subject of world importance, with both medicinal and economic implications. Use of herbal extracts in the form of dentifrice, medicated gel, local drug delivery systems proved to be efficient in preventing and treating periodontal disease. Hence in this review a brief explanation of pharmacologically active herbal plants are found to be useful in the prevention, treatment and maintenance of various dental diseases.

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