HERBOSOMES – HERBAL MEDICINAL SYSTEM FOR THE MANAGEMENT OF PERIODONTAL DISEASE

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Abstract
The effectiveness of any herbal medication is dependent on the delivery of effective level of the therapeutically active compounds. Herbosomes are recently introduced herbal formulations that are better absorbed and as a result produce better bioavailability and actions than the conventional botanical extracts. Herbal excipients are non-toxic and compatible they have a major role to play in pharmaceutical formulation. Herbal medicines have been widely used all over the world since ancient times and have been recognized by physicians and patients for their better therapeutic value as they have fewer adverse effects as compared to modern medicines. However, phytotherapeutics needs a scientific approach to deliver the components in a sustained manner to increase patient’s compliance and avoid repeated administration. This can be achieved by designing novel drug delivery systems for herbal constituents. Over the last decade, herbal and Ayurvedic drugs has become a subject of world importance, with both medicinal and economical implications. 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 study is to present overall view of the current strategies adopted for the formulation and application of traditional herbal remedies. This review article summarizes the current data on the effect of natural products like Acacia catechu, Aloe vera, Chamomile, Azadirachata indica, and Glycyrriza glabra on management of various periodontal diseases together with their biological activities.

Keywords: Herbosome, herbal medication, Pathogenesis, Biomarker

1. Introduction
The term “Herbo” means plant while “some” means cell-like. Over the past centuries phytochemical and phyto-pharmacological sciences established the compositions, biological activities and health promoting benefits of numerous botanical products. Most of the biologically active constituents of plants are polar or water soluble molecules. However, water soluble phytoconstituents (flavonoids, tannins, glycosides) are poorly absorbed either due to their large molecular size which cannot absorb by passive diffusion or due to their poor lipid solubility, severely limiting their ability to pass across the lipid rich biological membrane, resulting poor bioavailability. Phytomedicines, complex chemical mixtures prepared from plants have been used for health maintenance since ancient’s times. But many phytomedicines are limited in their effectiveness because they are poorly absorbed when taken by mouth. The phytosome technologies, developed by Indena S.P.A. Italy, markedly enhance the bioavailability of selected phytomedicines, by incorporating phospholipids into standardized extracts and vastly improve their absorption and utilization. Periodontal disease occurs when bacteria in plaque infect gums and bones that anchor the teeth. Periodontitis and dental decay are the primary causes of adult tooth loss. Periodontal disease is marked by bacterial overgrowth. However, a persistent immune response to chronic infections in the mouth is believed to play a major role in gum destruction. Researchers found Actinobacillus mycetemcomitans and Porphyromonas gingivalis, these bacteria sapper to cause aggressive periodontal disease which causes multiple deep pockets in the gum, associated with resistance to standard treatments for gum disease. P. gingivalis produce an enzymes called as arginine specific cysteine proteinase, that may disrupt the immune system and leads to subsequent periodontal connective tissue destruction.
2. Herbal Drugs used for the management of periodontal disease:

2.1 Acacia Catechu wild: *Acacia catechu* Wild. (Fam. Mimosae, Hindi- Khair, English- Citch tree, Sanskrit- Khadira) is widely used in Ayurveda for many diseases and mainly for skin diseases. *A. catechu* commonly known as Black khair and commercially used to obtain Kattha in North India. It found widely distributed in Jammu, Punjab, Himachal Pradesh, U.P., M.P., Bihar, A.P. and Maharashtra. *A. catechu* is used as mouthwash for mouth, gum and throat disease like gingivitis, stomatitis. Kattha is cooling, digestive, astringent, bleeding piles, uterine hemorrhages, leucorrhoea, atonics dyspepsia, chronic bronchitis, etc. the decoction of bark mixed with milk is taken to cure and cough.4, 5

2.2 Aloe Vera Miller: *Aloe vera* is *Aloe barbadensis* Miller. (Fam. Liliaceae). It is shrubby or arborescent, perennial, xerophytic, pea-green colour plant. It grows mainly in the dry region of Africa, Asia, Europe and America. In India it is found in Rajasthan, A.P., Gujarat, Maharashtra and Tamilnadu. The species is frequently used in herbal medicine and cosmetics. Many scientific studies for the use of extracts of *Aloe vera* have been undertaken. 6-7 Traditionally, Aloe was used topically to heal wounds, skin diseases and orally as a laxative. It is also used in conditions including diabetes, asthma, epilepsy and osteoarthritis. *Aloe vera* gel used in lotions and sunblocks. FDA has approved as a natural food flavoring agent.8
2. **Glycerrhiza Glabra** *(Liquoirice)*

*Glycerrhiza glabra*, commonly known as liquorice and sweet root and native to the Mediterranean and certain areas of Asia. Historically, the dried rhizome and root were employed medicinally by Egyptian, Chinese, Greek Indian and Roman civilization as an expectorant and carminative. Liquorice is used for treating upper respiratory ailments including cough, sore throat and bronchitis.

3. **Ocimum Sanctum L.** *(Tulsi)*

In Ayurveda, Tulsi (*Ocimum sanctum L.*) has been well documented for its therapeutic potentials and described as Dashemani Shwasaharni (antiasthmatic) and antikaphic drugs (Kaphaghna). Although, the traditional medical practitioners in India have been widely using this medicinal plant for management of various disease conditions from ancient time. Tulsi is used to control diabetes. Paste of leaves is found effective in the treatment of ringworm and other skin diseases. It is recommended as antidote for dog bite, scorpion bite and insect bite in traditional system of medicine. The seed are mucilaginous and demulcent and given in disorders of the genitourinary system. The leaves have also been shown to possess good anti-stress and analgesic activity.

4. **Curcuma Longa** *(Turmeric)*

Turmeric commonly known as Haldi and has been used for thousands of years as a dye, a flavoring and a medicinal herb. It is a rhizomatous herbaceous perennial plant of family Zingiberaceae. It is native to tropical South Asia and needs temperatures between 20 °C and 30 °C. Haldi is a perennial plant with orange, oblong tubers 2 or 3 inches in length and one inch in diameter, pointed or tapering at one end. When dried, it is made into a yellow powder with a bitter, slightly acrid, yet sweet taste. In India, it has been used traditionally as a remedy for stomach and liver ailments, as well as topically to heal sores. Ancient Indian medicine has touted turmeric as an herb with the ability to provide glow and luster to the skin as well as vigor and vitality to the entire body. Since turmeric has antimicrobial, antioxidant, astringent, and other useful properties, it is quite useful in Dentistry also.
Curcuma longa

5. *Matricaria Chamomile* (Camomile)

Chamomile or *camomile* is a common name for several daisy-like plants of the family Asteraceae. Wild Chamomile is an annual herb originally from Europe. The branched stem is erect, round, hollow, and grows to about 20 inches tall. The leaves are bipinnate, finely divided, light green and feathery. Chamomile has been shown to be anxiolytic, antistress, allergic reactions and atopic dermatitis. Chamomile is one of the most widely used flowers for herbal tea. It is used as a mild sedative and is good for insomnia as well as many other nervous conditions. Chamomile flowers are also used as anti-inflammatory and antispasmodic. The flowers are sometimes added to cosmetics as an anti-allergenic agent or made into a salve for use on hemorrhoids and wounds. The dried herb is made into potpourri and herb pillows, and is burned for aromatherapy. 

Matricaria chamomile

**Conclusion**

Periodontal disease is a chronic inflammatory disease affecting gingival, periodontal ligament, cementum and alveolar bone. Major etiological factor for periodontitis is microorganisms especially bacteria. The bacteria are normal tartar and produce toxins that provoke the body’s immune response. When allowed to progress, the disease destroys the supporting structure of teeth, which eventually leads to tooth loss. The cornerstone of successful periodontal treatment starts with establishing excellent oral hygiene. Certain periodontal pathogens like *Actinobacillus actinomycetemcomitans* and *Porphyromonas gingivitis* can colonize sub gingival area and reside in the tissues. Hence mechanical plaque removal along with the use of antimicrobial agents prove to be valuable aid in controlling microbial colonization. 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. To reinstate the sparkling smile not only teeth but gum care is also very important. Hence in this review, pharmacologically active herbal plants like *Acacia catechu, Aloe vera, Chamomile, Azadirachata indica* and *Glycerrhiza glabra* are found to be useful in the prevention, treatment and maintenance of periodontal diseases. The chemical constituents present in all these herbs like tannins, catechins, taxifolin, terpenoids, flavoinds, and alkaloids are responsible for antimicrobial activity. Hence, they are useful in controlling periodontal diseases. Research is needed to deliver these herbal extracts in more appropriate form like micro spheres, chip which can be inserted deep into the pocket. Standardization and quality assurance of these herbal products plays a key area which is to be focused in future and efforts have been initialized towards this target. There are much more opportunities for further research in the utility of herbal remedies for periodontal diseases. Hence, further research on nanoparticles, nanoemulsion techniques, which can deliver these extracts in more effective way is to be carried out in future for the management of periodontal disease in a natural way.

**References:**