

AYURVEDIC ABSTRACT REGARDING ORAL HEALTH**Katiyar Agrima*¹, Ingole Shiwani² and Daulatkar Kavita³**

^{1,2}PG Scholar, Dept. of Ayurved Sanskrit Samhita Evum Sidhant, B.M.A.M., Nandanvan,
Nagpur.

³H.O.D., Dept. of Ayurved Sanskrit Samhita Evum Sidhant, B.M.A.M., Nandanvan, Nagpur.

ABSTRACT

Oral disease continue to be a vital health problem world-wide with the incidence of halitosis, plaque, gingival inflammation and other disorders are on the rise in developing Countries. For prevention of oral diseases, modern medicine has had only limited success. Some types of viruses, bacteria, mouth and nasal cavity attack first .So we should be vigilant towards oral health. So there is a global need for safe and effective alternative preventive or therapeutic strategies for oral health. Ayurveda texts and researches have shown that chewing sticks described in ancient Ayurveda texts have medicinal properties. Kavala and gandoosh kriyas are claimed to cure several oral disease. Scientific validation of the Ayurveda dental health practices could

justify their incorporation into modern dental care. In this paper an attempt has been made to review various Ayurvedic therapeutic procedure such as dantadhawan (Chewing sticks), kavala, gandoosh and jihwanirlekhan and herbal plants for the prevention and the treatment of oral health and hygiene mentioned in Ayurveda.

KEYWORDS: Oral hygiene, dantadhawan, Kavala, Gandoosha.

INTRODUCTION

Oral diseases are one of the most important problems in this sedentary lifestyle and are on the rise in developing countries. Oral health is present to general well-being and relates to the quality-of-life that extends beyond the functions of the craniofacial complex. The link between the oral diseases and the activities of microbial species that form part of the micro biota of the oral cavity is well- established. Despite several chemical agents being commercially available, these can alter oral micro biota and have undesirable side-effects

Article Received on
16 July 2020,

Revised on 06 August 2020,
Accepted on 26 August 2020

DOI: 10.20959/wjpr202010-18572

Corresponding Author*Dr. Katiyar Agrima**

PG Scholar, Dept. of
Ayurved Sanskrit Samhita
Evum Sidhant, B.M.A.M.,
Nandanvan, Nagpur.

such as vomiting, diarrhoea and tooth staining.^[1] Oral health care professionals need to put home oral hygiene at the priority of their advice on preventive practice. There are plenteous numbers of native natural medicinal products which deserve recognition for their contribution in the improvement of oral-dental health.^[2] Various plants and natural products have been used for their pharmacological applications viz. antiulcer, wound healing, anti-inflammatory, antimicrobial and antioxidant properties etc.^[3]

According to World health Organization (WHO) 75% of the world's population uses herbs for basic health care needs. WHO has recommended for the incorporation of the traditional systems of medicine like Ayurveda into the primary health care system, for those communities where it is accepted. All the Ayurvedic medicines and local remedies are easily available in the rural areas where socioeconomic condition of the people is not good enough to buy costly toothpaste or curative medicines. Ayurveda must be reinterpreted in the light of our new knowledge and it must be incorporated in modern medicine along with other forms of traditional medicine.^[4]

WHO clears about oral health that “a state of being free from chronic mouth and facial pain, oral and throat cancer, oral infection and sores, periodontal (gum) disease, tooth decay, tooth loss, and other diseases and disorders that limit an individual's capacity in biting, chewing, smiling, speaking, and also in psychosocial wellbeing.”^[5]

Oral hygiene is not discussed as an individual and separate chapter in Ayurveda but it comes under the different chapters of Ayurvedic literature. Acharya Charak described it under the topic “*Swasthyavrata*” which means personal hygiene in “*Mattrashitiya aadhyaye*”.

Acharya Sushruta mentioned about oral hygiene in the “*Anagatabhadapratished*” chapter, while Acharya Vagbhatta represent it in “*Dincharya*” chapter. All Acharya have given their focus on personal hygiene which should be followed by each individual strictly. *Dhantapavan* (Herbal chewing sticks), *Jhihwanirlhekhana* (scaping of tongue), *Kavala*, *Gandoosha* and *tambul sevan* are the procedures told by Ayurveda for maintenance of oral hygiene.

Ayurveda gave importance upon the maintenance and promotion of health which is its primary objective where as cure of diseases are the secondary one. For the maintenance and promotion of positive health, several regimens are prescribed in Ayurveda which include

Dinacharya (daily routines), *Ratricharya* (night regimen), *Ritucharya* (seasonal regimen), *Sadvritta* (right conduct of life), *Achara Rasayana* (behavioural conducts). The regimens which should be followed every day is known as *Dinacharya* in Ayurveda which includes oral hygiene, food hygiene, personal hygiene etc. Under the *Dinacharya* (daily routines) various procedures for maintaining oral hygiene are well explained in all classical texts of Ayurveda.

Aims and objective: To review of literature focuses on role of various Ayurvedic procedures like *Danta-dhavana* (brushing the tooth), *Pratisarana* (Massaging the teeth and gums), *Jivha nirlekhana* (tongue cleaning), *Gandoosha and Kavala* (gargling) etc and along with herbal drug that can be used in prevention and management of oral diseases.

Dhantpavan/Dhattuna: (chewing sticks)

According to Ayurvedic texts, it is recommended that Dhantpavan (Chewing Sticks) in the morning as well in the night prevents oral diseases. The method of use is to crush one end, chew it and brush with it slowly. It is better to take from fresh plant. The stems used for *Dantapavan* should be healthy, soft, without leaves and knots. After cleaning the teeth with *Dattuna* it is torn into two parts and then it is used to scrap the tongue coatings. According to Acharya Sushruta, *Dantapavan* should be fresh and straight. Its length should be 12 *Angul* (9 inches), while thickness should be equal to *Kanshtika anguli* (little finger).^[6] These herb sticks should be either *Kashaya* (astringent), *Katu* (pungent), or *Tikta* (bitter) in *Rasa*.^[7]

Acharya Sushruta also includes *Madhura rasa*.^[8]

Acharya Sushruta also mentioned that which drug is better by *rasa*

Rasa	Drugs
<i>Kashaya</i> (Astringent)	<i>Khadira</i> (<i>Acacia catechu</i> linn.f)
<i>Katu</i> (Pungent)	<i>Karanja</i> (<i>Pongamia glabra</i> vent)
<i>Tikta</i> (Bitter)	<i>Nimba</i> (<i>Azadiracta indica</i> A.juss)
<i>Madhur</i> (Sweet)	<i>Madhuka</i> (<i>Bassia longifolia</i> Koen)

According to the individual's *prakarti* (constitution) and dominant *dosha*, it is stated that people with the *vata-dosha* dominance may develop atrophic and receding gums, and are recommended to use chewing sticks with sweet, bitter or astringent tastes, such as *Yasthimadhu* (*Glycyrrhiza glabra* Linn.) and the catch tree (*Acacia Catechu* Linn.) respectively.^[4] *Pittadosha* dominant individuals are recommended to use chewing sticks with a bitter taste such as the twigs from the *neem* tree (*Azadirachta indica* Linn.) and the *arjuna*

tree (*Terminalia arjuna* Linn.). Those with the *kaphadosha* dominant are likely to have pale and hypertrophic gums and are instructed to use chewing sticks with pungent taste, like *Kantaki karanja* (*Caesalipinia bonduc* Linn.) and the *Arka* plant (*Calotropis procera* Linn.). *Acharya Sushruta* had mentioned Tooth powder for cleaning the teeth. He told to use of *Dhattuna* dipped in *Madhu*, *Trikatu*, *Trivargha*, oil and *saindhav lavana*.^[5] Researches has proved that salt is good for tooth and oral hygiene. Now a days tooth paste are also coming along with salt.

The benefit of *Dantpavan* is to get rid from bad odour of mouth along with increase interest towards food due to removal of *Mala* from tooth, tongue and mouth.^[9] Chewing on these stems is believed to cause attrition and levelling of biting surfaces, facilitate salivary secretion and possibly, help in plaque control while some stems have an anti-bacterial action.^[7] Present day research has shown that all the chewing sticks described in ancient Avurveda have medicinal and anti- carcinogenic properties.^[8]

Brushing is contra indicated in the cases of mouth ulcer, fever, indigestion, those who have tendency to vomit, asthma, cough, thirst.

Jihwanirlekhana

It is to be done after *Danta pavana* (brushing tooth) using soft tongue scraper. Gently Tongue scrapping is done by a metal scrapper from root to tip. It is ideal to use gold, silver, copper, stainless steel or branches of the tree for the scrapping of the tongue. Its length should be ten angul. Its margin should be blunt so that it will not damage the tongue and should be curved so can be use easily.^[10] This stimulates the whole digestive tract and increases the *Agni* (digestive fire).^[11]

Scrapping of tongue stimulates the reflex points of the tongue. Removes bad odour (halitosis), Improves the sense of taste, stimulate the secretion of digestive enzymes. Clinical evidence also shows that use of tongue scrapers on a regular basis, has a significant improvement on eliminating anaerobic bacteria and decreases bad odour.^[12]

Pratisarana: (Massaging the teeth and gums with medicinal powder or paste)

Pratisaran is done with paste or powder of herbs or by honey/oil with herbal powder. It can be apply with fingers tip and rubbed or massaged gently on teeth and gums with mechanical pressure exerted in specific direction with fine powder of *Vapya* or *Kushta* and three groups

of three drugs - *Triphala*, *Trikatu* and *Trijata* mixed with honey. This process removes the food debris and plaque and helps to maintain the periodontal health. Indeed, recent research shows that turmeric extract and turmeric oil may even reverse precancerous changes in oral sub mucous fibrosis in humans.^[13] The active constituent of turmeric is known as curcumin, which has been shown to have a wide range of therapeutic effects.^[14] Another study (done by cikrikci et.al. 2008)revealed that applying a paste made from 1 tsp of turmeric with ½ tsp of salt and ½ tsp of mustard oil provides relief from gingivitis and periodontitis. It is recommended to rub the teeth and gums with this paste twice daily.^[15]

Kavala and Gandoosha (Oil pulling)

The difference between the two is only in the dosage and procedure of using the drug. In Gandoosha, the oral cavity is completely filled with medicated fluid, held for specific period until there is lacrimation and nasal discharge found and then spit out. Normally it is about 3-5 minutes. In Kavala Graha, a comfortable amount (three- fourths filled mouth) of medicated fluid is retained with the mouth closed for a specific time (about 3 minutes), gargled and then spit out.^[16]

In gandoosha, a medicated fluid is held mouthful for a specific period until there is lacrimation and nasal discharge, and then the patient spits it out. In kavala graha, the mouth is only three-fourths filled with the medicated fluid; the fluid is swished in the mouth for a specific time and then split out.^[17] The benefits of regular gandoosha are swarabalam (strength to voice), hanubalam (strength to jaws), strength to face, ruchyam (better taste perception), drudadhantha (strong and healthy teeth), and resistance against doshaja or aagantuja mukharogas.^[18] These oral cleansing techniques can also benefit bad breath, decay bleeding gums, dryness of throat, cracked lips and for strengthening teeth, gums and the jaw.^[19,20]

Oil pulling therapy can be done by using oils like sunflower or sesame oil for bad taste/bad smell, inflammation, feeling of numbness of the mouth and also teeth become strong. su.chi 24/14.

Many researches have proved that the oral mucosa does not act as a semi-permeable membrane to allow toxins to pass through. The medicated oil and fluid used in Kavala and Gandoosha probably protect the oral cavity from infection and inflammation by its antioxidant property. These mechanisms could be probable mode of action for the reduction

of plaque scores and colony count of the microorganisms in the oral cavity. The viscosity of used medicated oil probably inhibits bacterial adhesion and plaque co-aggregation.^[21] Oil pulling therapy is very effective against plaque induced gingivitis both in the clinical and microbiological assessment.^[22,23] Study showed that oil-pulling therapy could reduce the plaque index, modify gingival scores and the total oral bacteria count in gingivitis patients. A study done by Asokan S et al (2009) to evaluate the effect of oil pulling with sesame oil on plaque induce gingivitis, and to compare its efficacy with a chlorhexidine containing mouthwash Significant reduction of the pre- and post-values of the plaque and modified gingival index scores in both the study and control groups ($p < 0.001$) was achieved. Total colony count of aerobic microorganisms in the plaque of adolescents also decreases.^[42b] According to Prakash et al 2014, Trifala mouth rinse shows significant result in anti-cariogenic property and reduction in gingivitis and periodontitis.^[24]

Betel

Betel leaf is useful for the treatment of various disease like bad breath, boil, and abscess, conjunctivitis, constipation, swelling of gum etc as folk medicine while the root is known for its female contraceptive effects.

Ayurvedic herbs with various oral health related to their properties

Plants have been the major sources of medicine since the time immemorial. Medicinal plants have been used as a traditional treatment agent for numerous human diseases since ages in many parts of the world.

- **Amala:** has an antioxidant as well as astringent property which has been proven to be effective in the treatment of toothache, gingival inflammations^[25] and aphthous stomatitis^[26] and other types of mouth ulcers.
- **Amra/Mango (*Mangifera indica*):** Mango leaf contains ascorbic and phenolic acids. Studies have shown that mango leaves possess anti-bacterial properties against anaerobic dental microflora such as *Prevotella intermedia* and *Porphyromonas gingivalis* and can be effectively used as adjunct for maintenance of oral hygiene.^[27]
- **Grita kumara:** has property of dentin formation.^[28]
- **Kantakari:** seeds Dhoopan has been used in dental caries due to its chemical constituents like olanocarpine, carpesterol, solanocarpine, solasonine and solasodine.^[29]

- **Launga oil:** is commonly used to relieve pain to dental caries. Eugenol, which is the active component.^[30] is widely used in root canal therapy, dental abscess, temporary fillings and general gum pain and in other gum diseases.^[31]
Antibacterial, Antifungal, Antiviral, analgesic, immunostimulator and antioxidant property of Neem is well established.^[32] It has both mechanical as well as chemotherapeutic antiplaque agents^[33] Neem leaves mouth rinse is very effective in the treatment of periodontitis.^[34]
- **Nilgiri (*Eucalyptus globulus*):** Eucalyptus extract containing chewing gum showed a significant positive effect on plaque accumulation, gingival index, bleeding on probing and periodontal depth probing.^[35] Eucalyptus containing macrocarpals have also shown anti-bacterial activity against cariogenic bacteria.^[35,36] It also displaces saliva into the alkaline range.^[37]
- **Triphala:** has shown anticaries^[38] and antiplaque property. It is also used for strengthening the gums^[39] and root canal irrigant.^[40]
- **Tulsi** extract as 4% mouth rinse effectively reduces salivary streptococcal mutants counts.^[41]
- **Tila/Sesame (*Sesamum indicum*):** The oil pulling therapy done by using sesame oil, significantly reduces the plaque index, modified gingival scores and total colony count of aerobic microorganisms in the plaque of adolescents with plaque-induced gingivitis.^[42]
- **Triphala:** It contains the dried fruits of three medicinal plants Terminalia chebula, Terminalia bellerica and Phyllanthus embelica.^[43] It has shown a very promising anti-caries^[44] and anti-plaque properties, it is also used for strengthening the gums^[45] as a root canal irrigant.^[46]
- **Harita/Turmeric (*Curcuma longa* linn.):** There are many uses of turmeric in dentistry. The active component is curcumin. . Turmeric can be used in relief of pain, gingivitis, periodontitis, as colorant in pit and fissure sealant, in dental plaque detection etc.

MATERIAL AND METHODS

The whole review was carried out on the basis available literary materials includes *Brihatrayee, laghutrayee and other* Ayurvedic classics.

A PUBMED, MEDLINE, Medknow literature search was conducted using keywords Ayurveda, dentistry, oral health, Oil pulling, integration Apart from indexed journals, were also reviewed.

DISCUSSION AND RESULTS

Ayurveda is a holistic health system with science which also recommends some daily therapeutic procedures for the prevention and maintenance of oral health. Oral diseases are so common and one of the most important problems in public health and are on the rise in developing countries. Nowadays, due to lack of time, people are not paying any attention to oral health. Most of the oral diseases are due to lack of oral hygiene and bacterial infections. Material used in daily oral health care modalities of Ayurveda including medicinal plants has anti-bacterial activity against various microorganisms due to the presence of potential bioactive compounds. These help to reduce bacterial load in the oral cavity and thus prevent the formation of plaque, dental caries, ulcers and other problems. Many Ayurvedic procedure and herbal plants also possess anti-inflammatory, analgesic, anti ulcerative properties. Ayurveda recommends and persist on the use of herbal brushes. Dattuna can be a good alternative to the toothbrush as a means of preventing oro-dental diseases. Research has shown that all kinds of Dattuna (chewing sticks) described in ancient Ayurveda texts have medicinal and anti-cariogenic properties. Kavala and Gandoosh procedures are claimed to cure several systemic diseases.

Ayurveda has given great importance to oral hygiene while giving these procedures and herbs which costs little, possess various medicinal properties and works on various oral disorders and are also easily available.

CONCLUSION

Oral diseases are one of the most important problems in public health and are on the rise in developing countries along with sedentary lifestyle. Most of the oral diseases are caused due to the bacterial infections. The anti-bacterial activity of medicinal plants are due to the presence of potential bioactive compounds, which help to reduce bacterial load in the oral cavity and thus prevent the formation of plaque, dental caries and ulcers. Material used in daily oral health care modalities of Ayurveda including many medicinal plants have anti-bacterial activity against various microorganisms due to the presence of potential bioactive compounds.

Ayurveda recommends some daily therapeutic procedures for the prevention and management of oral health. The review of above Ayurveda oral health practices and scientific researches indicates that Ayurveda promotes health, modalities have sound scientific base and these scientific validation could justify their incorporation into modern oral health care.

According to WHO, Factors contributing to oral diseases are an unhealthy diet high in sugar, use of tobacco and harmful use of alcohol. Most oral health conditions are pervasively preventable and can be treated at their early stages.

In this paper, an attempt has been made to review various herbal plants and therapeutic procedures mentioned in Ayurveda that can be used as an adjunct for the management of oral health. The literature showed that there are many Ayurvedic drugs, which can be used in prevention as well as management of oral diseases.

REFERENCES

1. Torwane, N. A., Hongal, S., Goel, P., & Chandrashekar, B. R. Role of Ayurveda in management of oral health. *Pharmacognosy Reviews*, 2014; 8(15): 16–21.
2. Alpatá ES, Akinrimisi EO. Antibacterial activity of extract South African chewing sticks. *Oral Surg*, 1977; 44: 717-22.
3. Patil Ashwini et.al *Oral Health & Ayurveda Journal of Interdisciplinary Dental Sciences*, 2013; 2(2): 2013.
4. Bhardwaj: Ayurveda and oral health, *SRM Journal of Research in Dental Sciences*, 2015; 6: 3.
5. World Health Organization. *World Oral Health Report 2003*. Published, 2003; 15: 2018.
6. Sushruta. *Sushruta Samhita Dalhana Comm. Nibandhasangraha, Gayadasacharya comm. Nyayachandrika Panjika on Nidanasthana*. In: Jadavaji T, Narayana R, editors. *Chikitsa Varanasi: Chaukhamba Surbharati Prakashana*, 2008; 487: 24-4.
7. Agnivesha. *Charaka Samhita, Comm. Chakrapanidatta*. In: Jadavaji TA, editor. *Sutrasasthana Varanasi: Chaukhamba Surbharati Prakashana*, 2008; 125: 5-71.
8. Sushruta. *Sushruta Samhita Dalhana Comm. Nibandhasangraha, Gayadasacharya comm. Nyayachandrika Panjika on Nidanasthana*. In: Jadavaji T, Narayana R, editors. *Chikitsa Varanasi: Chaukhamba Surbharati Prakashana*, 2008; 487: 24-6.
9. Sushruta. *Sushruta Samhita Dalhana Comm. Nibandhasangraha, Gayadasacharya comm. Nyayachandrika Panjika on Nidanasthana*. In: Jadavaji T, Narayana R, editors. *Chikitsa Varanasi: Chaukhamba Surbharati Prakashana*, 2008; 487: 24-7-9.
10. Agnivesha. *Charaka Samhita, Comm. Chakrapanidatta*. In: Jadavaji TA, editor. *Sutrasasthana Varanasi: Chaukhamba Surbharati Prakashana*, 2008; 126: 5-74-75.

11. Vagbhatta: Astang Samgraha with commentaries sasilekha of Indu edited by Dr. Shiv Prasad Sharma, Chaukhamba Sanskrit Series Office, Varanasi. Sutra Sthana, Chapter, 2012; 313-15: 3-17.
12. Sushruta. Sushruta Samhita Dalhana Comm. Nibandhasangraha, Gayadasacharya comm. Nyayachandrika Panjika on Nidanasthana. In: Jadavaji T, Narayana R, editors. Chikitsa Varanasi: Chaukhamba Surbharati Prakashana, 2008; 558(10): 40-63.
13. Bhardwaj: Ayurveda and oral health, SRM Journal of Research in Dental Sciences, 2015; 6: 3.
14. Chaturvedi, T. P. Uses of turmeric in dentistry: An update. Indian J Dent Res, 2009; 20: 107-9.
15. Cikrikci, S., Mozioglu, E. and Yilmaz, H. Biological activity of curcuminoids isolated from *Curcuma longa*. Rec Nat Prod, 2008; 2: 19-24.
16. Sushruta. Sushruta Samhita Dalhana Comm. Nibandhasangraha, Gayadasacharya comm. Nyayachandrika Panjika on Nidanasthana. In: Jadavaji T, Narayana R, editors. Chikitsa Varanasi: Chaukhamba Surbharati Prakashana, 2008; 558: 40-63.
17. Agnivesha. Charaka Samhita, Comm. Chakrapanidatta. In: Jadavaji TA, editor. Sutrasasthana Varanasi: Chaukhamba Surbharati Prakashana, 2008; 127: 5-78-81.
18. Bethesda M. A Closer Look at Ayurvedic Medicine. Focus on Complementary and Alternative Medicine. National Center for Complementary and Alternative Medicine, US National Institutes of Health, 2006; 4.
19. Hebbar A, Keluskar V, Shetti A. Oil pulling – Unraveling the path to mystic cure. J Int Oral Health, 2010; 2: 11-4.
20. Asokan S. Oil pulling therapy. Indian J Dent Res., 2008; 19: 169.
21. Deepak Kumar Ahuja *et al.*, Concept of Oral Hygiene in Ayurveda, International Journal of Ayurvedic Medicine, 2014; 5(2): 148-153.
22. Asokan S, Emmadi P, Chamundeswari R. Effect of oil pulling on plaque induced gingivitis: A randomized, controlled, triple-blind study. Indian J Dent Res, 2009; 20: 47-51.
23. Singh A, Purohit B. Tooth brushing, oil pulling and tissue regeneration: A review of holistic approaches to oral health. J Ayurveda Integr Med, 2011; 2: 64-8.
24. Amith HV, Ankola AV, Nagesh L. Effect of oil pulling on plaque and gingivitis. J Oral Health Community Dent, 2007; 1: 12-8.

25. Nadkarni KM, Nadkarni AK. Vegetable kingdom. In: Nadkarni K, editor. Indian Materia Medica with Ayurvedic, Unani-Tibbi, Siddha, Allopathic, Homeopathic, Naturopathic and Home remedies. Bombay, India: Popular Prakashan Private Ltd, 1999; 3(1): 46.
26. Amruthesh S. Dentistry and Ayurveda- IV: Classification and management of common oral diseases. Indian J Dent Res, 2008; 19: 52–61.
27. Bairy I, Reeja S, Siddharth, Rao PS, Bhat M, Shivananda PG. Evaluation of antibacterial activity of *Mangifera indica* on anaerobic dental microglora based on in vivo studies. Indian J Pathol Microbiol, 2002; 45: 307-10.
28. Abuzied ST, Eissa SA. Comparative study on antibacterial activities of two natural plants versus three different intra canal medicaments.
29. Amruthesh S. Dentistry and Ayurveda-IV: Classification and management of common oral diseases. Indian J Dent Res, 2008; 19: 52-61.
30. Sinha AR, Bajaj VK, Singh P, Shekhawat S, Singh K. Phytochemical estimation and antimicrobial activity of aqueous and methanolic extract of *Ocimum sanctum* L. J Nat Prod Plant Resour, 2013; 3: 51–8.
31. Jittapiromsak N, Sahawat D, Banlunara W, Sangvanich P, Thunyakitpisal P. Acemannan, an extracted product from *Aloe vera*, stimulates dental pulp cell proliferation, differentiation, mineralization, and dentin formation. Tissue Eng Part A, 2010; 16: 1997–2006.
32. Wolinsky LE, Mania S, Nachnani S, Ling S. The inhibiting effect of aqueous *Azadirachta indica* (Neem) extract upon bacterial properties influencing in vitro plaque formation. J Dent Res, 1996; 75: 816– 22.
33. Botelho MA, dos Santos RA. Efficacy of a mouth rinse based on leaves of the neem tree (*Azadirachta indica*) in the treatment of patients with chronic gingivitis: A double-blind, randomized, controlled trial. J Med Plants Res, 2008; 2: 341–6.
34. Tandon S, Gupta K, Rao S, Malagi KJ. Effect of Triphala mouthwash on the caries status. Int J Ayurveda Res, 2010; 1: 93–9.
35. Botelho MA, dos Santos RA. Efficacy of a mouth rinse based on leaves of the neem tree (*Azadirachta indica*) in the treatment of patients with chronic gingivitis: A double-blind, randomized, controlled trial. J Med Plants Res, 2008; 2: 341 -6.
36. Nagata H, Inagaki Y, Tanaka M, Ojima M, Kataoka K, Kuboniwa M, et al. Effect of eucalyptus extract chewing gum on periodontal health: A double-masked, randomized trial. J Periodontol, 2008; 79: 1378-85.

37. Pistorius A, Willershausen B, Steinmeier EM, Kreisler M. Efficacy of subgingival irrigation using herbal extracts on gingival inflammation. *J Periodontol*, 2003; 74: 616-22.
38. Date BB, Kulkarni PH. Assessment of Rasa danti in various oral disorders. *Ayurveda Res Pap*, 1995; 2: 175-97.
39. Biradar YS, Jagatap S, Khandelwal KR, Singhanian SS. Exploring of antimicrobial activity of triphalamashi-An Ayurvedic formulation. *Evid Based Complement Alternat Med*, 2008; 5: 107-13.
40. Agarwal P, Nagesh L. Comparative evaluation of efficacy of 0.2% Chlorhexidine, Listerine and Tulsiextract mouth rinses on salivary Streptococcus mutans count of high school children – RCT. *Contemp Clin Trials*, 2011; 32: 802-8.
41. Kawamori T, Lubet R, Steele VE, Kelloff GJ, Kaskey RB, Rao CV, et al. Chemopreventive effect of curcumin, a naturally occurring anti-inflammatory agent, during the promotion/progression stages of colon cancer. *Cancer Res*, 1999; 59: 597-601.
42. Wohlmuth H. Triphala - A short review. *Inf Res Bot Med*, 2007; 16: 2.
43. Tandon S, Gupta K, Rao S, Malagi KJ. Effect of Triphala mouthwash on the caries status. *Int J Ayurveda Res*, 2010; 1: 93-9.
44. Date BB, Kulkarni PH. Assessment of Rasa danti in various oral disorders. *Ayurveda Res Pap*, 1995; 2: 175-97.
45. Biradar YS, Jagatap S, Khandelwal KR, Singhanian SS. Exploring of antimicrobial activity of triphala mashi-An Ayurvedic formulation. *Evid Based Complement Alternat Med*, 2008; 5: 107-13.