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A Scientific Review on Popular Herbs and Herbal Formulations of Ayurveda in Dentistry

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ABSTRACT

Ayurveda is the oldest and most popular traditional system of medicine in India. It has been of great relevance since ages. Not only Ayurvedic practitioners but even common people trust on the efficacy of this system. Many herbs and herbal formulations have been significantly used by Indian masses in various dimensions. Oral health is an important aspect of overall health. Although Dentistry has not been mentioned as a separate branch in Ayurveda, yet it has been considered under the scope of Shalakyatantra. Various dental diseases, their etiology, pathogenesis and treatment are mentioned in Ayurveda. Moreover Ayurveda has given great importance to preventive aspect of dental health. Various herbs and herbal formulations are mentioned in Ayurveda in relation to the preventive as well as curative prospects of dental health. These herbs have found relevance in modern day oral medications too. The present paper mainly aims to discover the role of various herbs and herbal formulations mentioned in Ayurveda

KEYWORDS

Dentistry, Oral Health, Shalakyatantra, Aloe Vera, Curcuma Longa, Irimedadaditaila



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INTRODUCTION

Herbs and herbal pharmaceuticals are becoming increasingly popular in modern era. Now a day's everyone wants an alternative to modern medicines pertaining to their growing side effects and resistance developing nature. Oral health hazards are attracting people to natural remedies. Dentistry in Ayurveda though is not a separate branch but is included in the *Shalaky Tantra* (Branch of Ayurveda pertaining to eye, ear, head, nose, teeth, hair etc.). It is recognized by *Dantha Swasthya* and *Danta Roga*. Ayurveda has abundant herbal remedies to offer to mankind. Ayurveda is not merely limited to some common household herbs available in our kitchen garden. It comprises of various herbal formulations described in various texts of Ayurveda. It has become the need of hour to revive the ancient herbal treasure and to highlight their importance in every field related to health. This article is aimed to highlight the scientifically evidenced review of various herbs and herbal formulations useful in dentistry.

MATERIALS & METHODS

Relevant Ayurvedic treatise, text book of *Ayurveda*, Ayurvedic Pharmacopoeia of India, previous available research work were thoroughly studied along with

extensive exploration of various search engines such as Google search, Medscape, Pubmed and other relevant databases.

BACKGROUND

In Ayurveda no separate branch pertaining to the health and diseases of teeth is mentioned. The oral and dental diseases and their treatment is mentioned in *Shalaky Tantra* or *Urdhva JatrugatanVyadhis*. According to *Shalaky Tantra*, there are sixty five oral diseases considered in Ayurveda which are further categorized under seven headings depending on their location. They can be enumerated as eight *Oshthagata* (lips), fifteen *Danmulagata* (alveolar margin), eight *Dantagata* (teeth), five *Jihvagata* (tongue), nine *Talugata* (palate), seventeen *kanthagata* (oropharynx) and three *Sarvayatnagata* (generalized) diseases¹. Various lifestyle and treatment modalities have been described in Ayurvedic text for the management of oral and dental disease. Main procedural and treatment modalities in routine practice are *Dant Dhavana* (Brushing), *JivhaLekhana* (Tongue scrapping) and *Gandusha* (gargling) or oil pulling. These procedures further require many herbs and herbal formulations such as Clove Oil (*Syzygiumaromaticum*), Aloe Vera (*Aloe barbadensis*), Turmeric (*Curcuma longa*), Garlic (*aliumsativum*), Honey (*ApisMellifera*), Neem



(*Azadirachta indica*), Ginger
(*Zingiber officinale*), Amlaki
(*Emblica officinalis*), Guggulu
(*Commiphora mukul*), Meswak
(*Salvadora persica*), Khadir (*Acacia catechu*),
Vajradanti (*Barleria prionitis*),
Sesame oil, *Irimehadaditaila*, *triphalala* etc.
for the desired results. These products have
been scientifically evidenced to prevent
dental diseases and to improve dental
health. It is important to evaluate, compare
and apply the benefits of the herbs
mentioned in Ayurveda to promote dental
health and to cure dental problems.

Popular Ayurvedic herbs and Classical herbal formulations in Dentistry

Clove Oil/Lavanga Taila (*Syzygium aromaticum*)

Clove oil has been used in various dental problems since ages. The main active principles of this herb are eugenol and β -caryophyllene. It is very effective against various bacteria and also acts as an analgesic and antiseptic^{2,3}. It is commonly used to relieve toothache. It also acts positively in patients with periodontitis and bleeding gums. It is also being used as an alternative in dental cements due to its analgesic properties. It can be an alternative to other anesthetic materials especially in children. It is also very cost effective in comparison to costly anesthetic medications⁴.

Tila Tailam / Sesame Oil (*Sesamum indicum*)

Tila Taila is considered as best oil in the category of oils in Ayurveda. It is procured from sesame plant. Its botanical name is *Sesamum indicum*. It is very beneficial due to its nutritional and healing properties. *Kavala* and *Gandusha* are the therapies for oral diseases in Ayurveda. They are also known as Oil pulling⁵. *Tila Taila* is commonly used for Oil Pulling due to its several medicinal, restorative and healing properties. In a research, Oil pulling therapy with sesame oil was found to be more advantageous over chlorhexidine due to minimum side effects as compared to chlorhexidine such as staining, prolonged after taste, and frequent allergy. Sesame oil use is very economical than chlorhexidine and is also easily available in most households⁶.

Kumari/ Ghrita Kumari (*Aloe Vera*)

Kumari is plant which grows in most parts of Asia. Its chemical constituents are anthraquinones, saccharides, prostaglandins, and fatty acids⁷. It has many important medicinal properties. It is a good pain killer. It has bactericidal, antiviral, antifungal, and antiseptic properties. A gel is procured from the aloe leaf. This aloe gel has been very popularly and positively used since ages for curing burns, cuts, wounds and skin problems. It is applied on the sites



of periodontal surgery. It is used as a local healing agent in small oral cavity injuries like toothpick injuries, chemical burns and allergies, mouth ulcers, gum abscesses, lichen planus, benign pemphigus and other gingival problems. It has very good response in geographic tongue, burning mouth syndrome and Xerostomia⁸.

Turmeric / Haridra (*Curcuma longa* Linn.)

Haridra is a magical herb of Ayurveda and easily available in every Indian kitchen. It is also known as Turmeric. It is used in various herbal formulations and also used as a single drug therapy due to its known and proven antiseptic and antibacterial properties. Moreover it is very good as a pain killer due to its anti-inflammatory, analgesic properties⁹. Recent researches have shown that turmeric extract and turmeric oil can successfully reverse precancerous changes in oral submucous fibrosis in human beings¹⁰. A research found rinsing mouth with 5 g of *Haridra* powder along with 1 gm cloves and 2 dried guava leaves in 200 g of water effectively reduced tooth ache¹¹. Due to its very nice color, it is also used as a colorant in dental sealants.

Ardraka/ Shunthi/ Ginger (*Zingiberofficinale*)

In Ayurveda, *Ardraka* is prescribed for various symptoms like nausea, vomiting,

motion sickness, sore throat, respiratory problems like asphyxia, asthma, hypoglycemia and vertigo etc. A study by Bone et al. revealed that ginger can be utilized as an analgesic. The procedure followed in the study was to partially burn ginger and mix it with common salt and to place this mixture near aching tooth. It also showed mild anti-inflammatory property¹².

Guggulu / Indian Bdellium gum/ Guggulipid (Commiphoramukul,

Guggulu is obtained from gum resin of the mukul myrrh tree. It has been extensively used in many Ayurvedic medicines due to its great medicinal properties. It is used in combination with other herbs for the treatment of arthritis, skin diseases, arthralgia, obesity, neuralgia, metabolic disorders, diabetes, infections in the mouth and menstrual problems too. Its tree is found commonly in Northern and western India. G. V. Satyavanti in 1966 published the report of first study showing the effects of guggulu on rabbits. Guggulu became very popular after the 1990s. Western world accepted its hypocholesterolaemic effects. Ayurvedic practitioners use it as an antioxidant, anti-inflammatory, hypolipidemic and anti obesity herb. Biologically active constituents of guggulu are Z and E isomers of guggulosteron compound. The medicinal properties of



Guggulu are also due to these components¹³. It is also effectively used to treat inflammation because of its potency to decrease C-reactive protein¹⁴.

Lashuna / Garlic (*Allium sativum*)

Lashuna is one of the most popular and researched medicinal herb. Its botanical name is *Allium Sativum*. *Allium Sativum* contains a herbal compound allicin. Allicin is produced by enzymatic activity of allinase. This Allicin has antibacterial, anti-carcinogenic and antiviral properties¹⁵. A study in this regard proved that Garlic extract can effectively inhibit the growth of *Streptococcus mutans*. Therefore garlic extract can be very effectively used in various herbal formulations to fight dental caries. It can be used as a constituent in toothpaste or mouthwash¹⁶.

Amlaki / Indian gooseberry (*Emblica officinalis*)

Amlaki is a restorative and rejuvenating *rasayana* herb of Ayurveda. It can also be used as a *rasayan* i.e. a generalized tonic. Due to its cell regenerative properties it improves oral health. It is advised to include fresh *amlaki* juice, or *amlaki* preparations in daily diet to improve overall health. Daily oral intake of 0.5 g of *amlaki* extract result in long term benefits for oral and dental health. Its regenerative properties can be attributed to Vitamin-C present in *amlaki*. Vitamin C facilitates the

conversion of proline into hydroxyproline which is an essential constituent of connective tissue. Therefore *Amlaki* can regenerate connective tissue effectively¹⁷. *Amlaki* is one of the richest natural known sources of Vitamin C and simultaneously act as a herbal tonic for the maintenance of the health of tongue and gums¹⁸.

Nimba / Neem (*Azadirachta indica*)

Nimba is a multi dimensional herb of Ayurveda. It occupies a special place in Indian masses due to its medicinal properties. The *Neema* leaves are rich in fibers, carbohydrates, calcium, many amino acids and fluorides¹⁹. Preparations of *Neema* are used to improve general health. *Neema Datuns* are used even today in rural areas of India. It can very effectively prevent and heal gums and teeth²⁰. A study reported, use of *Neema* based mouth rinse for 21 days resulted in significant reduction of gingival, bleeding, and plaque indices²¹.

Meswak (*Salvadorapersica*)

Datuns or herbal Chewing sticks have been very popular in the Indian subcontinent since ages. Meswak is derived from Arak tree. It is used in different parts of world as a herbal toothbrush²². It is highly useful for cleansing teeth, comparatively economical, has medicinal properties and is easily available in rural areas. The Meswak extract is also being used in dentifrices as an anti plaque and anti gingivitis agent²³.



Khadir (Acacia catechu)

Khadir has great medicinal values due to its astringent and antioxidant activities. The extract of *Acacia catechu* has many therapeutic benefits. It is antipyretic and anti-inflammatory. It is used in anti-hepato-protective preparations too. From a dental point of view, external use of *Khadir* powder can cure bleeding gums. Internally, it can be used in form of gargle to alleviate sore throat and dental caries. It is antimicrobial against several oral pathogens namely *Streptococcus species* and *Lactobacillus*²⁴ responsible for dental caries, *Candida*²⁵ species causing candidiasis and *Enterococcus faecalis*²⁶. In India, it is known as sweet acacia. The bark of this plant is used as astringent and demulcent. Branches/sticks are used in India as Datun or chewing sticks. It is good and soothing when chewed in sore throat. The extract of all the parts of this herb are inhibitory to various pathogens like *Bacillus subtilis*, *Staphylococcus aureus*, *Sarcinalutea*, *Pseudomonas aeruginosa*, and *Escherichia coli*²⁷.

Vajradanti (Barleriaprionitis)

Vajradanti as the name suggests, means strong teeth in Sanskrit. The naming of this herb itself suggests its significance in making teeth stronger. Its leaves can relieve tooth ache and root can treat glandular swellings and boils. *Vajradanti* is used

effectively in tooth ache and dental caries. The leaves of *Vajradanti* can heal wounds and cure bleeding gums^{28,29}. *Vajradanti* has antibacterial properties. The antibacterial action of *Vajradanti* is due to various effective compounds present in it. *Vajradanti* contains tannins, saponins, phenols, essential oils and flavanoids²⁹. It also contains different types of ester compounds such as iridoid-glucoside esters, acetyl-barlerin di-o-acetyl-shanzhiside methyl ester and verbascoide^{28,30}.

Triphala

Triphala consists of Haritaki, Bibhitaki and Amlaki. It has been effectively used to fight against various microbial infections in Ayurvedic practice³¹. Researchers have found that Triphala can act as a natural antibiotic against oral bacteria and dental infections³²⁻³⁷. A study compared the efficacy of Triphala with NaOCl, which is a common irrigant used in root canals and found the former much more effective against *E. faecalis*³⁸. Another study found Triphala significantly effective on bacterial growth on extracted human mandible premolars against *Streptococcus mutans*³⁹. Triphala decoction as a mouthwash was found more effective than chlorhexidine mouthwash and was successful in reversing precancerous oral lesions due to tobacco addiction⁴⁰⁻⁴².

Irimejadi taila



Irimedadi Taila is an Ayurvedic pharmaceutical oil based preparation useful in dental problems. It can be used in *Gandusha* and *Kavala* methods. The ingredients in the *taila* are; Yashti, Trijatha, Manjishta, Gayatri, Lodhra, Katphala, Kshirivrikshatwak, Irimedatwak, Musta, Agar, Shvetachandana, Raktachandana, Karpoora, Jati, Takkola, Mamsi, Dhataki, Gairika, Mrinala, Mishi, Vaidedi, Padmakesara, Kumkuma, Laksha, Samanga, Manjishta, Brihati, Bilvapatra, Suradruma, Shaileya, Sarala, Sprikka, Palasha, Rajani, Daruharidra, Priyangu, Tejani, Pradhakaleya, Pushkara, Jaya, Vyaghri, Madana, Tilataila⁴³. Taila is prepared by traditional *Tailapaka vidhi* which involves boiling the oil with prescribed *kasayas* (decoction) and *kalkas* of constituent drugs. This process ensures maximum absorption of the participant herbs⁴⁴. Irimedadi taila is indicated in almost all dental diseases⁴⁵⁻⁴⁷. Irimedadi taila improves periodontal status⁴⁷. Irimedadi taila was very effective in mechanical plaque control⁴⁸. Some clinical Studies found Irimedadi taila to be equally effective as chlorhexidine with minimum side effects⁴⁸⁻⁵¹.

DISCUSSION

Ayurveda is preventive and holistic method of medicine. Its uniqueness lies in its

modest and more healing approach towards human health. It focuses on a total health reform at personal as well as clinician's front. Ayurveda advocates procedures such as oral cleansing, tooth brushing, oil pulling, immunity boosting along with medicinal and surgical procedures. Ayurveda has recommended some interventions in daily regimen for preventing ongoing dental decay. These procedures include *Dantapavana* (Brushing), *JivhaNirlekhana* (Tongue scrapping) and *Kavala or Gandoosha* (gargling) or oil pulling. It has been advised in Ayurveda in the context of Daily Regimen to live a healthy life, that one should clean teeth by chewing herbal sticks from certain plants having *katu, tikta and kashaya rasa*. This *Datvana* or *Dant Dhavani* vis a vis herbal tooth brush should be approximately 12 angula pramana (approx. 9 inches) long. It should be thick as tip of little finger. The cleaning of teeth should be done twice a day, once in the morning and then after meals. *Datavana* is used after making one end *Kurichta* (smooth brush like) by chewing it and then slowly eating it⁵². The most famous *datvana* used in India is *neem (margosa or Azadirachta indica)* tree branches. Fresh stems of *Yashtimadhu* i.e. *liquorice (Glycyrrhizaglabra)*, *Khadira* i.e. *black catechu (Acacia Catechu)*⁵³, *Arjuna* tree



(*Termmalia arjuna*) and *Arka* (*Calotropis procera*)⁵⁴ are also used as *Datuna* in Ayurvedic literature. Chewing *Datuna* increases secretions of saliva and decreases plaque formation. Recent researches have proved that few of the prescribed plants have antibacterial and anti anti cariogenic properties⁵⁵. Ayurveda has advocated scrapping the tongue after *dantadhavana*. The tongue scrapping is called *JihvaNirlekhana* in Ayurveda. During ancient times *Jihva lekhani* (tongue scrappers) were made of various metals like *Swarana* (gold), *Rajata* (silver), *Tamra* (copper) or *Loha* (iron). Now as days tongue scrappers are generally of stainless steel or plastic. Tongue scrapping removes the food residues collected on tongue, removes bad odor, stimulates taste buds, improves digestion and also removes bacterial growth. It has been proved that regular use of tongue scrapers positively diminishes anaerobic bacterial growth and bad odor⁵⁶. *Gandusha* and *kavala* (gargling) or oil pulling involves moving oil in the mouth. The difference between *kavala* and *gandusha* is simply the difference in the quantity of the oil or medicinal liquid in mouth. *Kavala* includes that much quantity of oil which can easily be rotated inside mouth where as in *Gandush* quantity of oil is more so that it cannot be moved inside mouth. It has been

mentioned in Ayurvedic texts that *Kavala* or *Gandusha* not only cure oral and dental diseases but also cure many systemic diseases too. It prevents decaying of teeth, removes bad odor, stops bleeding of gums, removes dryness of mouth, cracking of lips, and strengthens the teeth and gums^{57, 58}. Oil pulling therapy can be done using oils like mustard oil or *Tila taila* i.e. sesame oil or medicated oils like *Irimedadi tailam*⁵⁹. It can be very beneficial in gingivitis developed due to dental plaque^{60, 61}. Tissue regeneration therapies have also great importance in Ayurveda. *Amla* (*Phyllanthus emblica*) is a well known herb in Ayurveda which is considered as a general precursor of oral health. It is very rich in Vitamin C which is the main reason that it improves in tissue regeneration. It can be taken orally as fresh juice or in the form decoction as a mouth rinse 2 gms of *amlaki* powder can be taken orally or in the form of capsules too. *Amla* improves in synthesis of connective tissue due to its rich Vitamin C content⁶².

CONCLUSION

Dentistry is a very relevant branch of modern medical science. Now a day's people are quite conscious about their oral health. Various over the counter formulations are in great demand for



maintenance of dental health as well as curing dental ailments. Ayurveda can have a promising role in this field. Although various researches have been done to investigate and prove the efficacy of herbs and herbal formulations at national and international levels, yet Ayurvedic scholars and physicians have not been successful to validate the relevance of Ayurvedic formulations and herbs in dentistry. Ayurvedic herbs and herbal formulations which are mentioned in Ayurvedic texts and are commonly used by masses in India have great potency. Need of the hour is to establish a separate branch of Ayurvedic Dentistry so that various clinical and fundamental researches can be carried out by Ayurvedic scholars.



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