ISSN: 2581-5989
PubMed - National Library of Medicine - ID: 101738774

International Journal of Dental Science and Innovative Research (IJDSIR)

IJDSIR : Dental Publication Service

Available Online at: www.ijdsir.com

Volume – 3, Issue – 5, September - 2020, Page No. : 596 - 608

Irimedadi Oil (Taila) In Oral Health Care: A Review

[1]Srishti Kumar, BDS, General Dentist, Bhatia Dentopulse, New Delhi

[2]Atul Kaushik, MDS, Associate Professor, Department of Oral Medicine and Radiology, SGT Dental College, Hospital and Research Institute, Gurugram

[3]Seema Kumar, BAMS, Medical Officer, New Delhi Municipal Corporation, New Delhi

[4]Monika Varshney, MDS, Assistant Professor, Department of Conservative Dentistry and Endodontics, SGT Dental College, Hospital and Research Institute, Gurugram

Corresponding Author: Srishti Kumar, BDS, General Dentist, Bhatia Dentopulse, New Delhi

Citation of this Article: Srishti Kumar, Atul Kaushik, Seema Kumar, Monika Varshney, "Irimedadi Oil (Taila) In Oral Health Care: A Review", IJDSIR- September - 2020, Vol. – 3, Issue - 5, P. No. 596 – 608.

Type of Publication: Review Article

Conflicts of Interest: Nil

Abstract

Irimedadi oil is a classical polyherbal formulation of more than forty herbs infused into sesame oil and is well documented in Ayurvedic Texts. Despite the complexity of the formulation, it is easily available commercially and widely used and prescribed in India for oral care by classical medicine practitioners. However, the formulation is virtually unknown in modern dental care practice. The present review aims at exploring the scientific rationale behind this classical formulation and its potential in modern dental care. Owing to broad-spectrum antimicrobial activity, cellular regeneration properties, and a wide variety of therapeutically beneficial effects in oral care, the oil can be a good alternative to chemical plaque inhibitors. Sesame oil has been traditionally used in oil pulling (a kind of a gargling practice used in Ayurveda). Numerous studies have been conducted to establish the role of various herbal medicines in the field of dentistry as well. Various diseases are known to be affecting the oral and dental tissues involving both the soft and hard tissues. These include diseases affecting the teeth, periodontium, alveolar mucosa, tongue, hard and soft palate, oropharynx, lips, salivary glands, maxilla, and mandible among others. Dental plaque is the principal etiological factor in almost all types of dental diseases. Plaque control is hence a significant aspect of preventive dentistry. Although, mechanical plaque control is found to be sufficient for maintaining oral hygiene in many patients chemical plaque control has a significant role in patients who are unable to maintain oral hygiene by mechanical means alone. Chemical agents have been used in adjunctive plaque control therapy for long. They have shown quite a few side effects with oral use. The current manuscript highlights various indications and advantages of Irimedadi Oil, making it a potentially useful candidate in modern dental care and effective management of dental plaque.

Keywords: Plaque, Ayurveda, Periodontal health, Irimedadi oil/taila

Introduction

Chronic inflammation of the periodontal tissues, usually develop as a result of imbalance between the host's immunity and the disease causing pathogen. The primary etiologic factor in all types of dental diseases is dental plaque.[1] Dental plaque can be defined as "the soft deposits that form the biofilm adhering to the tooth surface or other hard surfaces in the oral cavity including removable and fixed restorations".[2]

The biofilm formation on the surface of the tooth involves interactions between the tooth and the bacteria followed by interactions among the different bacterial species present in the biomass. The host mediated environmental factors also play a role in affecting the biofilm bacteria. A healthy periodontium is maintained when the host and bacteria are in a state of equilibrium with each other.[2] A variation in this state of equilibrium can lead to loss of connective tissue, resorption of alveolar bone and pocket formation which are clinical signs of periodontal disease.[1]

Plaque control is the removal of microbial plaque and the prevention of its accumulation on the teeth and adjacent gingival surfaces.[2]It is indispensible to the pursuit of dentistry. It not only prevents consequential gingival and periodontal diseases but also helps in restoring periodontal health in case of an existing disease. Mechanical plaque control is the primary mode of preventing dental and maintaining oral health. Chemical plaque control is used as an adjuvant to the mechanical cleaning methods. Toothbrushes are used primarily for mechanical plaque control. Other mechanical cleaning aids include dental floss, wooden tips and interdental brushes. Chemical plaque control includes chlorhexidine, essential oil mouthwash, quarternary ammonium compounds, sanguinarine.[2]

The chemical plaque inhibitors usually come with side effects. Therefore, there is a need to look for better alternatives to the agents being currently used for adjunctive plaque control therapy. Ayurveda offers many such unique herbal formulations that can be used as potential alternatives to medications with side effects.[3]

Irimedadi taila has been indicated in various dental diseases with plaque as the primary etiological factor. It has been used in plaque induced chronic gingival and periodontal problems.[4] Most ingredients of the oil have shown anti-inflammatory and antioxidant properties. It is also indicated in patients with complaint of bad breath. Some herbs of the formulation have also shown bactericidal action against caries causing bacteria. Thus, it might also prove to be a potential anti-caries agent. Its use has been associated with improved wound and ulcer healing.[5] Ayurvedic system of medicine has many such herbal products with negligible side effects that can aid in oral health maintenance and preventive and curative treatment of dental diseases.[6] The current manuscript highlights the various indications and uses of Irimedadi taila in dental practice and attempts to establish it as an excellent potential herbal alternative to chemical plaque control.

Ayurveda In Oral Health

The practice of Ayurveda in India dates back to 5000 years,[6] and holds the belief that the human body is composed of 5 basic elements, namely, space, air, fire, water, and earth. These are known as panchmahabhutas.[7] The amalgamation of these elements leads to formation of the three doshas. The doshas are responsible for the all biological, physical and mental processes happening in the human body. The doshas form the basis of diagnosis,

treatment and prognosis of a disease in Ayurvedic system of medicine.[8] The three doshas can be described as:

Table 1: The Three Doshas and their constituent elements.

Dosha	Constituent Element
Vata dosha	Space and air
Pitta dosha	Fire and water
Kapha dosha	Water and earth[8]

The biological constitution of each person consists of all the three doshas, but one dosha is more dominant than the rest in a particular body constitution.[8] Each dosha is divided into 5 sub-types and has one of each subtypes is predominant in the oral cavity. [9],[10],[11]

Oral health has always been of significance in the Indian system of medicine. Sushruta, the Father of Indian Surgery, has dealt with all types of oral diseases as a separate chapter in his book, The Sushruta Samhita.

Since ages, people have been using herbal remedies for oral care and hygiene maintenance. Natural remedies have an added advantage of having little or no side effects. Evidence suggests that green tea, tulsi, ajwain, turmeric, neem, cranberry, aloe vera, pot marigold; triphala etc. play a role in plaque control and preventing dental diseases.[12],[13],[14],[15],[16] Irimedadi taila is another natural plaque control method that has been less explored. It can be used as an effective alternative to the chemical mouthwashes that tend to have adverse reactions after use.

Types of mouthwashes in ayurveda

Ayurvedic mouthwashes can be classified into gandoosha and kavalagra. Kavalagra involves retaining the liquid in the mouth for a specified time while gandoosha requires thorough gargling and rinsing. Kavalagra may be in solid or semi liquid warm that can be liquified by adding water/liquid while gandoosha includes mostly essential oils.[1] Irimedadi oil can be used in both ways but mostly as gandoosha.[17]

Oil pulling: mechanism of action

Oil pulling is one of the main mechanisms that are responsible for efficacy of irimedadi oil as an adjuvant to mechanical cleaning methods. Oil pulling is described as the practice of swishing oil around the mouth. Swishing oil vigorously exerts physical strain on the oil molecules forming emulsified oil droplets, causing an enormous increase in its surface area. Consequently, there is oil film formation on the gingival and tooth surface which prevents accumulation of plaque and associated microbial populations on these surfaces. The oil also pulls the lipid bilayer of the cell membrane of the microbes, irreversibly damaging it and subsequently killing the bacteria.[18]

Oil gargling is most beneficial if performed early morning before having breakfast or brushing teeth. After swishing around the mouth for a few minutes, the oil is spat out immediately as it contains the harmful microbial flora and toxins that accumulate while sleeping during night. It can also prove useful in patients who are unable to use toothbrushes due to illness or disability.[19]

Irimedadi Taila In Oral Healthcare

Irimedadi oil is an herbal formulation that is used for oil pulling for both preventive and curative treatment of oral health problems.[20]

Method of formulation and use

Irimedadi oil is formed by infusion of various herbs in sesame oil,[21] which is also frequently used for oil pulling alone.[22] A decotion (formed by boiling herbs in water) of the various herbs in water is prepared and then filtered to obtain a clear solution which is then infused into the sesame oil. Therefore, this is a unique oil that contains both water and oil soluble components.[21]

The oil can be used in various ways. One way is topical application of few drops of the oil to affected area followed by gentle massage.[23] Another way is to use 10 ml of the oil as a mouthwash undiluted.[24] Another

common way of use that is advocated by Ayurvedic physicians and texts is to mix 5-10 mL of the oil in 150 mL of lukewarm water and hold it for 2-5 minutes in the mouth.[17]

Indications with active ingredients[21]

Irimedadi taila is exclusively used for topical application and gargling as preventive and curative treatment of oral diseases. Its use has shown marked reduction in plaque and gingival index.[23],[25] Plaque is the most common etiological factor for dental diseases.[1] The use of this oil can thus help in prevention and management of various dental disorders. The main indications along with the active ingredients that aid in cure of the particular ailment are given below in Table 2.

Table 2: Active ingredients of Irimedadi taila and their therapeutic roles in oral care

Halitosis	Clove;[26] Trijatha;[21] Palasha;[27] Jati;[28] Yashtimadhu;[29] Agaru;[30] Karpoora;[31] Katphal.[32]
Bleeding gums	Irimeda twak;[33] Khadir;[34] Gairik;[35] Padmakashth;[36] Lodhra;[37] Laksha;[38],[39] Chandana;[40] Sarala;[41] Priyangu;[42] Nyagrodha;[43] Vyaghri.[44]
Plaque induced gingivitis and periodontitis	Irimeda twak;[33] Khadir;[34] Rajani(turmeric);[45] Sarala;[41] Takkola;[46] Brihati;[47] Manjishtha;[48] Agaru;[30] Lodhra;[37] Trijatha;[21] Jati;[28] Rakta-Chandana;[40] Kumkuma (saffron);[49] Suradruma;[50] Palasha;[27] Yashtimadhu;[29] Nyagrodha.[43]
Dental caries prevention	Khadir;[34] Yashtimadhu;[29] Laksha;[38],[39] Daruharidra;[51] Palasha;[27] Irimeda twak.[33]
Maintenance of overall dental and oral health	Trijatha;[21] Katphal;[32] Musta;[52] Shilajita;[53],[54] Priyangu;[42] Yashtimadhu;[29] Lodhra.[37]
Ulcer and wound healing	Yashtimadhu;[29] Gairik;[35] Padmakashth;[36] Brihati;[47] Palasha;[27] Irimeda twak;[33] Rakta-chandna;[40] Bilvapatra;[55],[56] Nyagrodha.[43]
Oral candidal infections	Mrinala;[57] Mishi;[58] Musta;[52] Palasha;[27] Chandana;[40] Rakta-chandana;[40] Khadir;[34] Yashtimadhu;[29]
Oro-dental abscess	Irimeda twak;[33] Nyagrodha.[43]
Burning mouth syndrome	Nyagrodha;[43] Irimeda twak.[33]
Xerostomia	Karpoora;[31]

Mechanism of Action Of Ingredients In The Oral Cavity

The oil contains a paste prepared from 12 milligrams of each of the following:

Clove: It has been used in preventive and therapeutic oral health maintenance since ancient times.[24] Eugenol, the primary compound in clove has pain relieving action. It is capable of blockade of N-methyl-d-aspartate (NMDA) receptors involved in nociception as well as the vanilloid receptors. [59] It has also shown marked antibacterial activity against major periodontal pathogens such as P.gingivalis, A.actinomycetemcomitans, P.intermedia, F.nucleatum, as well as Candida albicans and gram-positive bacteria. As it fights bacteria which produce hydrogen sulfide and methyl mercaptan it helps prevent oral malodor.[60],[61]

Khadir: It has antimicrobial action against streptococcus and lactobacillus species (primary bacteria in pathogenesis of dental caries), candida species (causal agent of candidiasis) and many common periodontal pathogens.[34] The presence of Catechin, epigallocatechin, epicatechin

gallate, epigallocatechin gallate etc is the reason for its antioxidant and anti-inflammatory action.[62]

Manjishtha: Manjishtha inhibits the lipoxygenase pathway and various inflammatory mediators.[63] Manjishtha works on a mechanism similar to vitamin E. It protects lipids from peroxidation and encourages reduced glutathione (GSH), which are majorly responsible for its antioxidant action. [64] It plays a role in preventing gingival recession.[48]

Yashtimadhu: Yashtimadhu has a mechanism of action similar to steroids. Its anti-inflammatory property is attributed to inhibition of phospholipase A2, cyclooxygenase and prostaglandin formation. Production of reactive oxygen species (ROS) is inhibited by Glycyrrhizin and glabridin, components of Yashtimadhu. Its topical use is recommended for apthous ulcers. It has potential of chemotherapeutic action for treatment of oral cancer. It has also been known to reduce dental plaque and its associated problems like caries causing bacteria, bad breath etc. Hence, helps maintain oral health.[29]

Agaru: It has been used traditionally for treatment of bad breath because of its antimicrobial and anti-inflammatory properties. It also has a strong aroma and fragrance which helps prevent halitosis.[30]

Musta: It is effective against S.aureus, E.faecalis, E.coli, P.aeruginosa, S.pyogenes. Research has shown that Musta increases the levels of superoxide dismutase. **It provides strength to gums and teeth.[52]**

Gairik (Red Ochre): It is an oxide of iron with titanium and other metals and silicate of alumina. Known for its astringent and cooling effects, it is effective in bleeding gums and mouth ulcers.[35]

Lodhra: It contains 3 principal alkaloids responsible for its anti-inflammatory, anti-oxidant and astringent action. It helps in maintaining the periodontium in a healthy state and prevents bleeding from gums.[37],[65]

Rajani: It has been commonly implicated in treatment of various dental inflammatory conditions. Moreover, studies have established its anti-inflammatory and anti-plaque action on periodontium. This has been attributed to its inhibition of prostaglandin synthesis and blockade of receptors for tumor necrosis factor- α (TNF-α), a major inflammatory mediator.[68] It has been used as a dental-plaque staining agent as a part of the plaque detection system.[45] It has peroxyl radical scavenging action and inhibits ROS-generating enzymes. It also possesses anti-cancer properties as it affects various cellular signaling pathways and apoptosis. Studies have demonstrated that turmeric exhibits anti-plaque activity in aqueous solution.[68] It has found use in gingivitis, periodontitis, toothache, and swelling. It can also be used as a pit and fissure sealant. It also presents strong antimicrobial and antifungal properties.**[45]** Efficacy of turmeric mouthwash has also been studied separately.[69]

Laksha (lac from laccifer lacca): It is a resin secreted by a lac insect. It has role in preventing dental caries and bleeding gums.[38],[39]

Karpoora (camphor): It affects TRP (transient receptor potential) channels to produce excitatory or inhibitory effects on sensory nerves. Hence, it is useful in toothaches and xerostomia.[31],[66]

Padmakashth: It is commonly used for skin ulcers, herpes infection and bleeding gums.[36]

Katphal: Its use has been implied traditionally in dental pain, bad breath, and strengthening of teeth and gums.[32]

Jati: It has activity similar to non-steroidal anti-inflammatory drugs. Jati contains flavonoid anti-oxidants such as beta-carotene and cryptoxanthin. Its aromatic and antibacterial properties help treat bad breath**.[28]**

Chandana: It has a coolant, astringent and sedative action. Thus, it helps heal bleeding gums. Studies have

shown that it can act against majority of oral pathogens, candida species as well as HSV-1.[40]

Rakta Chandana: It possesses free radical scavenging action against hydrogen peroxide, hydroxyl, and superoxide**. S**timulation of growth factors or signal cascade helps in control of hemorrhage and wound healing**.** It may be implicated as an anti-cancer agent in the future.[67]

Kumkuma: Its constituents, crocin and safranal have high radical scavenging activity. It also contains flavonoids, tannins, anthocyanins, alkaloids, and saponins, which are responsible for its anti-inflammatory property.[49]

Mrinala: It possesses antibacterial, antifungal and antioxidant pharmacological actions. Its ethanol extract has been used in various dental diseases.[57]

Mishi: It has shown remarkable activity against many gram-positive oral bacteria such as S.aureus, E.faecalis, E.coli, B.subtilis, B.cereus and P.aeruginosa. It is an effective antifungal agent against Candida albicans.[58]

Sarala: It is very useful in cases of bleeding gums due its hemostatic nature.[41] It works on both peripheral and central mechanism of pain and is widely used for its strong antiseptic and anti-inflammatory actions.[70]

Takkola: It has shown activity against bacteria, yeast, and fungi and finds use in curing toothaches.[46]

Dhataki: It is helpful in dental pain management and possesses strong astringent action.[71]

Brihati: It has been used traditionally for relieving toothache and is also useful in curative treatment of oral ulcers.[47]

Bilvapatra: It has been used in treatment of stomatitis. It has strong action against bacterial, viral and fungal pathogens.[55],[56]

Suradruma: It produces significant anti-inflammatory effects in both acute and chronic inflammation. It has demonstrated analgesic potential comparable to aspirin and morphine.[50]

Shilajita: It is indicated for treating various dental diseases. It has shown anti-inflammatory, antifungal and analgesic properties.[53],[54]

Palasha: It plays a significant role in preventing gum diseases and halitosis. The inhibition of COX-2 enzyme along with various inflammatory mediators is possibly the mechanism behind its anti-inflammatory activity. Further, the presence of flavinoids in Palasha inhibits prostaglandins in the late phase of inflammation**.** It is also used for preventive treatment of dental caries as it possesses significant antimicrobial activity against streptococcus. It improves epithelialization, wound contraction, cellular proliferation and collagen synthesis at the wound site.[27],[72]

Daruharidra: The antioxidant and astringent activity of Daruharidra has been established by research.[51]

Priyangu: Its bark is useful for treatment of bleeding gums and gingivitis. It also strengthens the gums.[42]

Pushkara: It has been used for treating toothache and various other dental problems.[73]

Vyaghri: it acts as a strong bactericidal agent killing various plaque pathogens. It is useful in bleeding gums and may help in improving clinical attachment levels.[44],[74]

Other constituents such as Trijatha, Spricka**,** Mamsi, Tejani, Pradhakaleya, Jaya, Madana exhibit properties similar to other ingredients and produce a synergistic effect.[21] However, the exact mechanism of their action in the oral cavity is not known and requires further research.

The decotion that is infused in sesame oil to make irimedadi oil contains:

Irimeda twak: it has analgesic and anti-inflammatory properties and also prevents bleeding from wounds. Thus, it aids in treating oral ulcers and periodontal diseases

(bleeding gums, infection and inflammation of gingival tissue, etc.) as well as preventing dental caries.[33],[75]

Nyagrodha: it has been effective in treating gingivitis, periodontal disease and toothaches.[43],**[75]**

Plaksha: It contains sorbifolin and scutellarein, which are Flavinoids derivatives and hence, it has strong antioxidant action. It may help in treating ulcers and in salivation.[75]

Udumbara: It has strong astringent and anti-septic properties and may be used in bleeding gums due to its hemostatic action.[75]

Ashwattha: It is indicated in bleeding gums and oral ulcers due to its wound healing, astringent and hemostatic properties.[75]

Pharmacological properties of various ingredients Various pharmacological properties of the ingredients in Irimedadi taila have been summarized below in Tables 3, 4 and 5:

Table 3: Pharmacological properties of the ingredients in Irimedadi taila

Anti-inflammatory	Antioxidant	Analgesic	Antibacterial	Antifungal
Irimeda twak[33]	Khadir[34]	Irimeda twak[33]	Trijatha[21]	Trijatha[21]
Khadir[34]	Trijatha[21]	Shilajita[53],[54]	Musta[52]	Mrinala[57]
Manjishtha[48]	Musta[52]	Suradruma[50]	Jati[28]	Mishi[58]
Agaru[30]	Jati[28]	Rajani[45]	Rakta Chandana[40]	Musta[52]
Lodhra[37]	Kumkuma[49]	RaktaChandana[67]	Mrinala[57]	Palasha[27]
Trijatha[21]	Rajani[45]	Manjishtha[48]	Mishi[58]	Chandana[40]
Musta[52]	Mrinala[57]	Brihati[47]	Rajani[45]	Rakta-Chandana[67]
Jati[28]	Mishi[58]	Clove[26]	Palasha[27]	Khadir[34]
Rakta-Chandana[67]	Brihati[47]	Karpoora[31]	Vyaghri[74]	Yashtimadhu[29]
Kumkuma[49] (saffron)	Bilvapatra[55],[56]	Pushkara[73]	Agaru[30]	Rajani[45]
Rajani[45] (turmeric)	Daruharidra[51]	Katphal[32]	Khadir[34]	
Sarala[41]		Takkola[46]		
Takkola[46]				
Brihati[47]				
Bilvapatra[55],[56]				
Suradruma[50]				
Shilajita[53],[54]				
Palasha[27]				

Nyagrodha[43]

Table 4: Pharmacological properties of the ingredients in Irimedadi taila (contd.)

Anti-ulcer	Haemostatic	Anti-caries	Astringent	Anti-halitosis
Yashtimadhu[29]	Irimeda twak[33]	Khadir[34]	Irimeda twak[33]	Clove[26]
Gairik[35]	Khadir[34]	Yashtimadhu[29]	Khadir[34]	Agaru[30]
Padmakashth[36]	Gairik[35]	Laksha[38],[39]	Manjishtha[48]	Trijatha[21]
Brihati[47]	Padmakashth[36]	Daruharidra[51]	Gairik[35]	Palasha[27]
Palasha[27]	Lodhra[37]	Palasha[27]	Lodhra[37]	Yashtimadhu[29]
Irimeda twak[33]	Laksha[38],[39]	Irimeda twak[33]	Dhataki[71]	Jati[28]
Rakta-Chandana[67]	Chandana[40]		Jati[28]	Karpoora[31]
	Sarala[41]		Brihati[47]	Katphal[32]
	Priyangu[42]		Rajani[45]	
	Rakta-Chandana[67]		Chandana[40]	
			Suradruma[50]	
			Daruharidra[51]	
			Nyagrodha[43]	

Table 5: Pharmacological properties of the ingredients in Irimedadi taila (contd.)

Strengthening of teeth and gums	Anti-cancerous	Antiseptic
Trijatha[21]	Rajani[45]	Rajani[45]
Katphal[32]	Yashtimadhu[29]	Sarala[41]
Musta[52]	Shilajita[53],[54]	
Priyangu[42]	Rakta-Chandana[67]	
Yashtimadhu[29]		
Lodhra[37]		

Clinical Studies And Outcome

The use of irimedadi oil has shown significant reduction in plaque, gingival and gingival bleeding index. Few studies have been conducted to test its efficacy and effect on various indices.[23],[25],[76]

A study was conducted on 100 patients with plaque induced gingivitis in Karad. The patients were divided into two groups. The first group patients were treated with oral prophylaxis only while the patients in the second group were given irimedadi oil as an adjunct to prophylaxis for 3 weeks. The results showed that there was marked reduction in plaque, gingival and gingival bleeding indices in the patients of the second group. The second group patients also showed improvement clinically.[23]

Another study conducted in Multan has shown similar results. Here, 200 patients were randomly selected and divided into two groups of 100 each. One group was given

irimedadi taila along with scaling while the other one was treated with scaling alone. There was significant statistical as well as clinical improvement in gingival and plaque indices.[76]

Improvements in Gingival and Gingival bleeding index following the use of the oil were noted in another study as well. The results were analogous to the results of the previous studies.[25]

Comparison with Commercially Available Mouthwashes

Almost all commercially available mouthwashes are known to cause some adverse effect with their use. Chlorhexidine gluconate is one of the most commonly prescribed mouthwashes. It has for long been in use as the primary chemical plaque control agent in dentistry. It is used as a benchmark in adjunction to mechanical cleaning aids. It has a very high substantivity and broad spectrum antibacterial action. It is commonly used to provide relief in inflammatory diseases of the periodontium, gingival bleeding and plaque aggregation.

Despite its benefits, Chlorhexidine gluconate causes brownish discolouration of teeth (Maillard reaction), discolouration and white patches or sores of gingival, labial and oral mucosa, reduced taste sensation, metallic taste perception, mucosal erosions, and salivary gland swelling.[77],[78] Severe allergic reactions may lead to edematous swelling of lips, tongue and even throat. This can lead to airway obstruction and difficulty in breathing.[77]

A study was conducted in Maharashtra compared the efficacy of irimedadi oil with that of chlorhexidine mouthwash. The subjects diagnosed with plaque induced gingivitis were divided into three groups. The subjects in group A were treated with scaling alone, the ones in group B with scaling along with chlorhexidine rinses while the ones in group C were given irimedadi taila along with scaling. The results showed that patients in group A showed less improvement while groups B and C showed almost equal improvements in plaque and gingival index scores respectively.[24] Thus, Irimedadi oil stands as a potent alternative for chlorhexidine.

Conclusion

Irimedadi oil has been widely used and prescribed in India for oral care by classical medicine practitioners. However, in spite of its huge potential in oral care, the usage and properties are widely unknown to modern dental care practitioners. The present manuscript has highlighted the scientific rationale behind this classical formulation and its possible impact in modern dental care. Owing to the wide variety of therapeutically beneficial effects in oral care and minimal side effects, the oil can be a good alternative to chemical plaque inhibitors.[21],[62] More longitudinal studies need to be conducted to prove its long term efficacy.[59] It also has potential benefits in other oral and dental diseases which are yet to be explored. Furthermore, studies need to be conducted on its efficacy in other dental diseases and conditions such as xerostomia, burning mouth syndrome, oro-dental abscess among others. Irimedadi oil shows strong promise owing to scientifically proven effects of its ingredients and can be very useful in modern dental care. The formulation can be easily modified to gel form, made more attractive in terms of color or taste and also modified for use as spray, to promote consumer acceptance. Although herbal products are considered very safe, rarely individuals may have allergic response to one or the other components in the oil. However, the current literature search does not reveal any such findings.

References

1. Page RC, Kornman KS. The pathogenesis of human periodontitis: An introduction. Periodontol 2000. 1997; 14: 9–11

2. Carranza FA, Newman MG, Clinical Periodontology. 8th ed. Philadelphia. Saunders WB. 1999.
3. Mandel ID. Chemotherapeutic agents for controlling plaque and gingivitis. J Clin Periodontol. 1998; 15: 488–498.
4. Amruthesh S. Dentistry and Ayurveda - IV: Classification and management of common oral diseases. Indian J Dent Res 2008; 19:52-61
5. Shastri K, Chaturvedi GN, Elaborated Vidyotani Hindi Commentary Part-I on Charaka Samhita of Agnivesha. Sutra Sthana, Chapter 5, Verse no. 80. Varanasi. 2009.
6. Turagam N, Mudrakola DP. The Scope of an Alternative Medicine to Cure Oral Diseases. Dentistry. 2017; 7(10): 453.
7. Malik K, Mishra B. Panchamahabhuta - Aadharbhut siddhant and their application in chikitsa. J Ayurveda Integr Med Sci**. 2018;** 3(5): 146 – 150.
8. Lad DV. The doshas and their sub-types. Fundamental principles of Ayurveda. 1st edition. Albuquerque, New Mexico. 2002.
9. Pole S. Plant Profiles. Ayurvedic Medicine: The Principles of Traditional Practice. 2nd edition. London, Philadelphia. 2013.
10. Kumar A, Dwibedy BK. Critical Analysis of Vata Dosha in Sushruta Samhita. Int J Ayurveda Pharma Res. 2015; 3(6):1-4.
11. Nagaraj K, Yashesh P. A Physiological Understanding of Bodhaka Kapha. International Ayurvedic Medical Journal. 2017; 5(9):3608-3612.
12. Yates R, Shearer BH, Huntington E, Addy M. A method to compare four mouthrinses: time to gingivitis level as the primary outcome variable. J Clin Periodontol. 2002; 29: 519-523.
13. Kaushik A, Tanwar R, Kaushik M. Ethnomedicine: Applications of Neem (Azadirachta indica) in dentistry. Dent Hypotheses. 2012; 3:112-114.
14. Khairnar MR, Karibasappa GN , Dodamani AS, Vishwakarma P, Naik RG, Deshmukh MA. Comparative assessment of cranberry and chlorhexidine mouthwash on streptococcal colonization among dental students: a randomized parallel clinical trial. Contemp Clin Dent. 2015; 6:35-39.
15. Khairnar MS, Pawar B, Marawar PP, Mani A. Evaluation of Calendula officinalis as an anti-plaque and anti-gingivitis agent. J Indian Soc Periodontol. 2013; 17:741-747.
16. Arunachalam LT, Sudhakar U, Vasanth J, Khumukchum S, Selvam VV. Comparison of anti-plaque and anti-gingivitis effect of curcumin and chlorhexidine mouth rinse in the treatment of gingivitis: A clinical and biochemical study. J Indian Soc Periodontol. 2017; 21:478-483.
17. Boloor VA , Hosadurga R, Rao A, Jenifer H, Pratap S. Unconventional dentistry in India – an insight into the traditional methods. J Trad Complement Med. 2014; 4 (3):153-158.
18. 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.
19. Shanbhag VK. Oil pulling for maintaining oral hygiene - A review. J Tradit Complement Med. 2016; 7(1), 106–109.
20. Maharshi Sushruta. Sushrata Samhita. Pratham Bhag Purvardh. Vyakhyakar-Kaviraj Ambika Datt Shastri, Prastavana Lekhak-Dr. Pranjivan M. Mehata, Chikitsa Sthan Adhyay 22nd Mukhrog Chikitsa chapter. Sloka No. 34, 35.

21. Bhaisajyaratnavali- Kaviraj govinda das sen edited with siddhiprada hindi commentary by Prof. Sidhinandam Mishra. Chapter 61 “Mukharogadhikar”, Irimedadi taila, slok no. 129-133
22. Mythri H. Oil pulling: A traditional method on the edge of evidence. Dental Hypotheses. 2017. 8(3):57-60
23. Patil S, Varma SA, Suragimath G, Abbayya K, Zope SA, Kale V. Evaluation of Irimedadi Taila as an adjunctive in treating plaque-induced gingivitis. J Ayurveda Integr Med. 2018; 9(1): 57-60.
24. Mali GV, Dodamani AS, Karibasappa GN, Vishwakarma PK, Jain VM. Comparative Evaluation of Arimedadi Oil with 0.2% Chlorhexidine Gluconate in Prevention of Plaque and Gingivitis: A Randomized Clinical Trial. J Clin Diagn Res. 2016; 10(7):31-34
25. Gupta S, Pagyal N. Irimedadi taila as a medicine to treat plaque induced gingivitis. World J Pharm Life Sci. 2020; 6(3): 131-132.
26. Kaur D, Chandrul KK, Syzygium aromaticum L. (Clove): A vital herbal drug used in periodontal disease. Indian J Pharm Biol Res. 2017; 5(2):45-51.
27. Tiwari P, Jena S, Sahu PK. Butea Monosperma: Phytochemistry and Pharmacology. Acta Sci Pharm Sci. 2019; 3(4): 19-26.
28. Phulsagar S, Dundi M, Bhagwat S, Girigaon Y. An Inside Review Of Myristica Fragrans Houtt. – A Potential Medicinal Plant of India. Int J Med Sci Clin Invent. 2014; 1(9): 500-513.
29. Sidhu P, Shankargouda S, Rath A, Hesarghatta P, Ramamurthy, Fernandes B, Singh AK. Therapeutic benefits of liquorice in dentistry. J Ayurveda Integr Med. 2018. 1-7.
30. Alam J, Mujahid M, Badruddeen, Rahman MA, Akhtar J, Khalid M, Jahan Y, Basit A, Khan A, Shawwal M, Iqbal SS. An insight of pharmacognostic study and phytopharmacology of Aquilaria agallocha. J App Pharm Sci. 2015; 5(8): 173-181.
31. Garg N, Jain A. Therapeutic and Medicinal Uses of Karpura-A Review. Int J Sci Res. 2017; 6(4): 1174-1181.
32. Syed S, Ahmad M, Fatima N, Mahjabeen, Jahan N. Neuropharmalogical studies of Myrica nagi bark. Int. J. Biol. Biotech. 2013; 10 (4): 553-555.
33. Ahlawat B, Sarswat O. Arimedas oil for oil pulling. World J Pharm Med Res. 2018; 4(2): 168-168.
34. Ankita. A Scientific Review on Popular Herbs and Herbal Formulations of Ayurveda in Dentistry. Int J Ayu Pharm Chem. 2019; 10(1). 227-240.
35. Mishra N, Rajput PS and Mishra RC. Evaluation of Shonitsthapan Mahakashaya. World J Pharm Res. 2017; 6(3): 334-341.
36. Pallavi G, Virupaksha Gupta KL, Rishi R. Ethnopharmaco-Botanical Review of Padmaka – Prunus puddum Roxb. Int J Ayurvedic Herb Med. 2011; 1(3): 87-99.
37. Singh P, Singh R, Gupta L N, Kumar N. Lodhra- A Single Remedy for Different Ailments. International Journal of Pharmaceutical & Biological Archives 2015; 6(1): 1 – 7.
38. Reddy ASP, Lalitha BR. Laksha: A Comprehensive Review. Ayurpub. 2(4):600-609.
39. Reshma BV, Manohar NR, Anaha VI. A Review on Laccifer Lacca. World J Pharm Res. 2018; 7(10): 206-218.
40. Sindhu RK, Upma, Kumar A, Arora S. Santalum Album Linn: A Review on Morphology, Phytochemistry and Pharmacological Aspects. Int J Pharmtech Res. 2010; 2(1): 914-919.
41. Chaturvedi S, Dass S. Traditional Medicinal and Economic uses of Gymnosperms. Bull Env Pharmacol Life Sci. 2011; 1(1): 70-72.

42. Pandey AS, Srivastava B, Wanjari MM, Pandey NK, Jadhav AD. Callicarpa Macrophylla: A Review of its Phyto-chemistry, Pharmacology, Folklore claims and Ayurvedic studies. Global J Res. Med. Plants & Indigen. Med. 2014; 3(3): 91-100.
43. Varanasi S, Narayana A. Medico Historical Review of Nyagrodha. J Ind Inst Hist Med. 2007; 37:167-178.
44. Rita P, Animesh DK. An updated overview on Solanum xanthocarpum schrad and wendl. Int J Res Ayurveda Pharm. 2011; 2 (3):730-735.
45. Chaturvedi TP. Uses of turmeric in dentistry: An update. Indian J Dent Res. 2009; 20:107-109.
46. Peng W, Lin Z, Wang L, Chang J, Gu F, Zhu X. Molecular characteristics of Illicium verum extractives to activate acquired immune response. Saudi J Biol Sci. 2016; 23: 348–352.
47. Sharma V, Hem K, Seth A, Maurya SK. Solanum indicum Linn.: An ethnopharmacological, phytochemical and pharmacological review. Current Research Journal of Pharmaceutical and Allied Science. 2017; 1(2): 1-9.
48. Priya MD, Siril EA. Traditional and modern use of Indian madder (Rubia cordifolia L.): an overview. Int J Pharm Sci Rev Res. 2014; 25: 154-164.
49. Gupta M. Pharmacological Properties and Traditional Therapeutic Uses of Important Indian Spices: A Review. Int J Food Prop. 2010; 13(5), 1092-1116.
50. Chaudhary AK, Ahmad S, Mazumder A. Cedrus deodara (Roxb.) Loud.: A Review on its Ethnobotany, Phytochemical and Pharmacological Profile. Phcog J. 2011; 3(23). 12-17.
51. Tamilselvi S, Balasubramani SP, Venkatasubramanian P, Vasanthi NS. A Review on the Pharmacognosy and Pharmacology of The Herbals Traded as 'Daruharidra'. Int J Pharma Bio Sci. 2014; 5(1): 556 – 570.
52. Al-Snafi AE. A Review on Cyperus Rotundus: A Potential Medicinal Plant. IOSR Journal of Pharmacy. 2016; 6(7): 32-48.
53. Wilson E, Rajamanickam GV, Dubey GP, Klose P, Musial F, Saha FJ, Rampp T, Michalsen A, Dobos GJ. Review on shilajit used in traditional Indian medicine. J. Ethnopharmacol. 201; 136(1):1-9.
54. Agarwal SP, Khanna R, Karmarkar R, Anwer MK, Khar RK. Shilajit: A Review. Phytother. Res. 2007; 21: 401–405.
55. Dutta A, Lal N, Naaz M, Ghosh A, Verma R. Ethnological and Ethno-medicinal Importance of Aegle marmelos (L.) Corr (Bael) Among Indigenous People of India. Am J Ethnomed. 2014; 1(5): 290-312.
56. Parmar N, Singh S, Patel B. Historical and Ethno-Medical Review on Bilva (Aegle marmelos Corr.). J. Res. Tradit. Med 2016; 2(5): 138-146.
57. Prasad C, Singh D, Shukla O, Singh UB. Cymbopogon jwarancusa - An important medicinal plant: A review. Pharma Innov J. 2014; 3(6): 13-19.
58. Saleh-e-In MM, Sultana N, Rahim MM, Ahsan MA, Bhuiyan MNH, Hossain MN, Rahman MM, Roy SK, Islam MR. Chemical composition and pharmacological significance of Anethum Sowa L. Root. BMC Complement Altern Med. 2017; 17:127.
59. Asl MK, Nazariborun A, Hosseini M. Analgesic effect of the aqueous and ethanolic extracts of clove. Avicenna J Phytomed. 2013; 3(2): 186–192.
60. Kothiwale SV, Patwardhan V, Gandhi M, Sohoni R, Kumar A. A comparative study of antiplaque and antigingivitis effects of herbal mouthrinse containing tea tree oil, clove, and basil with commercially available essential oil mouthrinse. J Indian Soc Periodontol. 2014; 18(3): 316–320.
61. Aylıkcı BU, Çolak H. Halitosis: From diagnosis to management. J Nat Sci Biol Med. 2013; 4(1): 14–23.

62. Lakshmi T, Aravind KS. Preliminary phytochemical analysis and in vitro antibacterial activity of Acacia Catechu willd bark. Int j of phytomedicine 2011; 3: 579-84.
63. Antarkar SS, Chinwalla T, Bhatt N. Anti-inflammatory activity of Rubia cordifolia Linn. In rats, Indian J Pharmacol. 1983; 15: 185-188.
64. Tripathi Y B, Shukla S, Sharma V K. Antioxidant property of Rubia cordifolia extract and its comparison with vitamin E and parabenzoquinone. Phytotherapy research .1995; 10:1002.
65. Sreejit N, Lakshmi PM. Wound healing properties of Symplocus racemosa. Int J Innovative Res Med Sci. 2016; 1(1): 28-33.
66. Xu H, Blair NT, Clapham DE. Camphor Activates and Strongly Desensitizes the Transient Receptor Potential Vanilloid Subtype 1 Channel in a Vanilloid-Independent Mechanism. J Neurosci. 2005; 25(39): 8924–8937.
67. Bulle S, Reddyvari H, Nallanchakravarthula V, Vaddi DR. Therapeutic Potential of Pterocarpus santalinus L.: An Update. Pharmacogn Rev. 2016; 10(19):43-49.
68. Hewlings SJ, Kalman DS. Curcumin: A Review of Its' Effects on Human Health. Foods. 2017; 6(10): 92.
69. Waghmare PF, Chaudhari AU, Karhadkar VM, Jamkhande AS. Comparative Evaluation of Turmeric and Chlorhexidine Gluconate Mouthwash in Prevention of Plaque Formation and Gingivitis: A Clinical and Microbiological Study. J Contemp Dent Pract. 2011;12(4):221-224
70. Kaushik D, Kumar A, Kaushik P, Rana AC. Analgesic and Anti-Inflammatory Activity of Pinus roxburghii Sarg. Adv Pharmacol Sci. 2012; 2012: 245431.
71. Kumar D, Sharma M, Sorout A, Saroha K, Verma S. Woodfordia fruticosa Kurz.: A Review on its Botany, Chemistry and Biological activities. J Pharmacogn Phytochem 2016; 5(3): 293-298.
72. Sharma AK, Chaudhary M, Kumar R, Chauhan B, Kaushik K, Agarwal V. Evaluation of antiinflammatory and analgesic activity of Butea monosperma gum. Novel Sci Int J Pharm Sci. 2012; 1(2): 60-64.
73. Soni MK, Sharma O. Pushkarmoola (Inula Racemosa Hook. F.): An Ayurvedic Review. World J Pharm Med Res. 2018; 4(3), 199 – 201.
74. Dalvi YV. The Comprehensive Review on Kantakari Plant. Asian J Pharm Sci. 2018; 8(3): 140-144.
75. Khare CP. Indian Medicinal Plants: An illustrated Dictionary. New Delhi. 2007.
76. Fida A, Qureshi SA, Mumtaz F. Assessment of Herbal Preparation (Irimedadi Taila) An Adjunctive in Treating Plaque Caused Gingivitis. Pak J Med Health Sci. 2018; 12(1):567-569.
77. Prasanna SGV, Lakshmanan R. Characteristics, Uses and Side effects of Chlorhexidine- A Review. IOSR J Dent Med Sci. 2016; 15(6):57-59.
78. Flotra L, Different modes of chlorhexidine application and related local side effects. J Periodontal Res. 1973 12:41-44.