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SIGNIFICANCE OF MEDICINAL HERBS IN DENTAL DISORDERS: AN UPDATE

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Abstract: The use of herbal remedies to cure medical issues is extensive. They have been used for generations to cure gingival disease, periodontitis, oral infections, stained teeth, etc. However, there are some research that have gathered data on their impacts. The objective of this review article is to collect and compile data on a few significant herbs that are utilized in dental treatment.

Keywords: Anti-inflammatory, Anti-bacterial, Dentistry, Diseases, Herbs

Introduction: Herbs remain a significant source of medicines in many nations around the world despite the enormous advancements in modern science. Since the beginning of time, people have employed herbs with healing powers. Due to the problems and side effects of many chemical and synthetic medicines in recent years, the dependability and usability of herbs have gained in significance. Many of the recommended medications today come from plants. In order to treat conditions like dental caries, tooth discomfort, mouth odor, canker sores, pyorrhea, bleeding gums etc the discipline of dentistry has also started to make use of herbal remedies. Now a days in dentistry, it's a great deal of interest in plant-based antiseptics, antibacterial, antimicrobial, anti-fungal, antioxidant, antiviral, and analgesic compounds.

Since many plant extracts contain anti-inflammatory and bleeding-reducing qualities that are essential during dental procedures, it is essential to understand how they react with the body as well as other medications. For example, various plant extracts, such as neem leaves, roots of burdock, noni fruit, propolis etc have lately been successfully used as intra-canal medications in

the disciplines of periodontics and endodontics, establishing a new role for herbal remedies in general dental care [1].

History: Over many ages, the knowledge of medicinal plants has been incorporated into Indian culture. The rigveda contains records of 67 different species of medicinal plants, while the Yajurveda contains records of 81 different species, the atharvaveda contains records of 290 different species, the charak samhita contains records of 1,100 species, and the sushruta samhita contains records of 1,270 species. These descriptions have served as the foundation for traditional formulations up to this point [2,3].

This page provides useful information on the usage, interactions, harmful effects, evidences and cautions about herbs that are beneficial in dentistry, in addition to dosages.

Chamomile (Scientific name: Matricaria recutita): 1-2% of volatile oils can be found in chamomile flowers[4]. The other active components include quercetin, apigenin, flavonoids, and luteolin. Due to the presence of these active components, Chamomile shows i) antispasmodic, ii) anti-inflammatory, and iii) smooth-muscle relaxing effects, which are extremely advantageous in the digestive tract [5,6].

Use - In order to avoid gingivitis and periodontal disorders, it is used as a mouthwash in dentistry. Chamomile tea is frequently used in between meals, almost 3 to 4 times per day. As an alternative, 4ml to 6ml of the tincture can be used 3 times per day in between the meals or 2g to 3g of the herb can be taken in the form of a tablet or a pill and it can also be taken as capsules with dosage of 300–400 mg three times per[7].

Side Effects- Chamomile allergy symptoms have been documented[8]. These side effects include bronchial constriction when used systemically, as well as allergic skin responses when used topically [9].Usage of chamomile should be avoided by those who have allergies to mugwort pollen and plants in the Asteraceae family, which includes ragweed, asters, and chrysanthemums, even if reports of such adverse effects are rare[10].

Spilanthes acmella: It is a well-known remedy for toothaches as several medical applications, has gained recognition as a significant medicinal plant, and is in great demand around the globe. Many phytochemical investigations have been documented from its traditional applications in food and medicine. It is a very useful perennial herb with many applications as an ancient medicine for health, beauty, and cosmetic treatments, as well as a source of nutritious food or supplements that are high in antioxidants. The most common isolates from the plant species were lipid alkamides, notably spilanthol, and some other bio-active metabolites such as

coumarin, triterpenoid phenolic and flavonoid compounds. *S. acmella's* vasorelaxant and antioxidant activities allow it to be used as a fast-acting muscle relaxant in the anti-aging treatments and also in the anti-wrinkle treatments[11].

The analgesic effect of the plant extract is made possible by the presence of flavonois.

Fig.1 *Spilanthes acmella*

Uses- *Spilanthes acmella* is utilized in dental procedures to treat recurring aphthous stomatitis, periodontal disorders, and toothaches. Plant extracts that are used- leaves, flower, roots, flower heads[11,12].

Vitex Negundo Linn: The *Vitex Negundo* is an upright, low tree or woody plant that can reach heights of up to 8 millimeters. Typically, the bark is reddish brown in colour. Three to five finger-like, lance-shaped leaflets make up each branch of its leaves.

Phytochemical constituents: The *Vitex Negundo* plant contains a high concentration of metabolites. Alkaloids, glycosides, tannins, flavonoids, steroids, sugars, saponins, and other metabolites. Utilizing different solvents such methanol, benzene, ethanol, chloroform, ether, or aqueous extracts, these metabolites can be separated[13,14].

Fig 2. *Vitex Negundo*

Use in dentistry:

i) To relieve tooth ache, crushed leaves are applied to the aching tooth together with table salt[15].

ii) Vitex Negundo as a root canal irrigant- Infections in the oral cavity are caused due to the presence of some bacterias, mostly they are the opportunistic pathogens and they are very much capable of entering the root canal which contains necrotic debris and then they initiate an infection. The most frequent Enterococcus species to be cultivated from non-healing endodontic patients is Enterococcus faecalis. It is an anaerobic gram positive coccus.

Sodium hypochlorite (NaOCl), is a cost-effective irrigant which is used to remove the microorganisms in vitro. The primary drawbacks of sodium hypochlorite is its failure to remove the smear layer, unpleasant flavour and its excessive toxicity[17]. Vitex Negundo revealed significant antibacterial effects on biofilms after 2 to 4 weeks. Adopting seasoner substitutes as a passage irrigant may seem advantageous given the variety of unfavourable characteristics of NaOCl[19].

iii) As an obturating substance- As an obturating substance for primary teeth, vitex negundo essential oil can be utilized in combination with calcium hydroxide powder and zinc oxide powder[19].

iv) As intracanal medicament - as a drug for intracanal use *Vitex Negundo* is one of the potentially best and good obturating materials because of its its capacity to clean the bacterias in the root canal and its involvement in combating different root canal microorganisms[18].

v) Vitex as a mouth rinse- Gargling with vitex can help treat dental conditions. It can be used as mouthwash due to its effectiveness against the majority of periodontal infections[20].

Peppermint (Botanical name: Mentha piperita): An estimated 0.1–1.0% volatile oil is produced by peppermint leaves, and the main components are menthol (29–48%) and menthone (20–31%). 50. Intestinal gas may be avoided and relieved using peppermint oil[21]. In order to alleviate gas and indigestion, peppermint oil or peppermint tea are frequently utilized. It functions as an analgesic and lessens pain when given topically[22]. Topical use of peppermint oil might also have a relaxing effect.

Fig 3. ***Mentha piperita***

Use in dentistry: To treat toothaches, a piece of cotton is soaked in peppermint oil, and then its placed in site of pain in the oral cavity or it can be rubbed on the tooth directly. Use 3-6 g of peppermint leaf pills or capsules daily as a mouthwash to soothe inflamed gums[7].

Side effects- The widespread consensus is that frequent use of peppermint tea is safe. Some people may experience burning and gastrointestinal distress with peppermint oil[5]. People who have significant liver damage, persistent heartburn, gallbladder inflammation, or bile duct blockage should stay away from it[23].

Echinacea (Common name: Purple coneflower): The immune system is hypothesized to be supported by echinacea through stimulating white blood cells[24].The three primary groupings of elements that may interact to promote the generation and the activities of WBCs (such as lymphocytes and macrophages) are: i) Alkylamides polyacetylenes, ii) Polysaccharides, and iii) Caffeic acid derivatives[7].

Use in dentistry- The mouthwash made by combining Echinaea with menthol, peppermint oil, chamomile and sage is very effective in the treatment of some periodontal diseases an gingivitis[25].

Side effects- If we see in the lengthy history of echinacea usage, there have never been any reports of acute or chronic harmful effects[26].Echinacea was chronically administered to rats at dosages several times the therapeutic amount for humans, yet no adverse effects were observed[25

Bloodroot (Botanical name: Sanguinaria Canadensis): Bloodroot's chief active ingredients are alkaloids, primarily sanguinarine.

Use in dentistry- Bloodroot has the capacity of preventing the growth of microorganism in the oral cavity. It is added in many toothpastes, mouthwash and various other items for maintaining

proper oral hygiene[27,28]. Some cough suppressant compositions contain bloodroot tincture, which can be taken three times a day with no more than 10 drops each dose10[7].

Side effects - Utilizing dental products with Bloodroot may increase the risk of leukoplakia, a disorder marked by the presence of white spots or some white patches in the oral cavity. Despite past studies demonstrating that using dental products containing Bloodroot over the long term is safe, a current article claims that it is believed to be premalignant[29,30].

Dosage - Bloodroot should only be administered in extremely small dosages because even 1 ml or 1 g of the tincture might cause nausea and vomiting[31,32].

Some other herbs that are commonly used:

S. no.	Scientific Name	Common Name	Parts used	Uses in dentistry
1.	*Azadirachta indica*	Neem	Stem	For cleaning teeth, stems are utilized as a toothbrush.
2.	*Curcuma longa*	Turmeric	Rhizome	It is non-toxic and has a variety of medical applications. It's utilized in the treatment of oral cavity lesions.
3.	*Zingiber officinale L.*	Ginger	Rhizome	It has both antibacterial and anti inflammatory properties. Dental diseases can be treated using it.
4.	*Aloe vera (L.) Burm. F.*	Aloe vera	Gel extracted from the leaves.	It possesses angiogenic, anti-fungal, anti-inflammatory & antioxidant effects. Different mouth ulcers can be cured with it.
5.	*Syzygium* aromaticum	Clove	Flower bud Essential oil	It is used as dentrifrice. It is used to cure dental caries.
6.	*Terminalia chebula retz.*	Haritaki	Fruit	It has antiviral, antifungal, antidiabetic, antioxidant and antimutagenic properties. It is used to prevent gingivitis and some periodontal diseases.
7.	*Emblica officinalis Gaertn.*	Anwla	Fruit	Fruits are utilized to cure mouth ulcers and bleeding gums.
8.	*Syzygium cumini*	Jamun	Shoot	Dental caries is treated by brushing the teeth with tender twigs once a day.
9.	*Osimum sanctum L.*	Tulsi	Leaf	Chewing leaves helps keep the mouth fresh by increasing salivation. Cure oral infections and ulcers as well.
10.	*Psidium guajava*	Guava	Leaf	Mouth blisters can be healed by chewing the tender leaves.

Fig 4. 1) Neem (Azadirachta indica)

Fig 5. 2) Turmeric (Curcuma longa)

Fig 6. 3) Ginger (Zingiber officinale L.)

Fig7. 4) Aloe vera (Aloe vera (L.) Burm. F.)

Fig8. 5) Clove (Syzygium)

Fig 9. 6) Haritaki (Terminalia chebula retz.)

Fig10.7) Anwla (Emblica officinalis)

Fig11.8) Jamun (Syzygium cumini)

Fig12.9) Tulsi (Osimum sanctum L.)

Fig13.10) Guava (Psidium guajava)

Conclusion: Over the globe, the use of herbs in dental treatments is expanding quickly. For the treatment of a variety of oral illnesses and ailments, dental professionals have employed herbal extracts from several recognized and recently discovered species of plants. It is of the utmost

importance to approach herbal medicine with a scientific mindset: be cautious and analytical, but also be open to learning new things.

References

1) Pujar M, Makandar SD. 2011. Herbal usage in endodontics- a review. Int JContem Dent. 2:34–37.

2) Joy PP, Thomas J, Mathew S et al. Medicinal plants.Tropical horticulture. 1998;2:449-632.

3) Kumar G, Jalaluddin M, Rout P et al. Emergingtrends of herbal care in dentistry. J Clin Diagn Res 2013;7:1827-9.

4) Nissen HP, Blitz H, Kreyel HW. Prolifometrie, eine methode zurbeurteilung der therapeutischen wirsamkeit kon Kamillosan-Salbe. Z Hautkr 1988 63: 184–190.

5) Wichtl M. Herbal Drugs and Phytopharmaceuticals. Boca Raton,FL: CRC Press; 1994, 322–325.

6) Achterrath-Tuckermann U, Kunde R, Flaskamp E et al. Pharmacological investigations with compounds of chamomile. V.Investigations on the spasmolytic effect of compounds of chamomile and Kamillosan on the isolated guinea pig ileum. PlantaMed 1980 39: 38–50.

7) Jamile B. Taheri1, Somayyeh Azimi2 , Nasrin Rafifieian3 et al. International Dental Journal 2011; 61: 287–296

8) Brown DJ. Herbal Prescriptions for Better Health. Rocklin, CA:Prima Publishing; 1996, 49–56.

9) Foti C, Nettis E, Panebianco R et al. Contact urticaria fromMatricaria chemomilla. Contact Derm 2000 42: 360–361.

10) Reider N, Sepp N, Fritsch P et al. Anaphylaxis to chamomile:clinical features and allergen cross-reactivity. Clin Exp Allergy2000 30: 1436–1443.

11) EXCLI Journal 2013;12:291-312 – ISSN 1611-2156Received: November 29, 2012, accepted: March 24, 2013, published: April 04, 2013

12) Abascal and Yarnell, 2010 Alternative and Complementary Therapies 7(4):216-220

13) Sibaram Paria, Shaswati Chaki, Sujata Ghosdastidar et al. Evaluation of antimicrobial activity and antioxidant property of V. Negundo Leaf Extract.IJDFR. 2011, 2(4):337-45.

14) Fauziya Basri, H.P. Sharma, Sazya Firdaus et al. A Review of Ethnomedicinal Plant-*VitexNegundo* Linn. *International Journal of AdvancedResearch*., 2014, 2(3), 882-894.

15)Hebbar, S.S., Harsha, et al. G.REthnomedicine of Dharwad district in Mysore India-plants used in oral health care, *Journal ofEthnopharmacology*.2004:94, 261-266.)

16) Prabhaka, Senthilkumar M, Priya MS et al. Evaluation of antimicrobialefficacy of herbal alternatives (Triphala and Green Teapolyphenols), MTAD, and 5% Sodium

Hypochloriteagainst Enterococcus faecalis Biofilm Formed on ToothSubstrate: An *In Vitro* Study. *J Endod*. 2010; 36:83-6

17) Sunita Khatak, Jalaj Naagar, Anuj Gupta et al. Antimicrobial activity of *Vitex negundo*against pathogenic bacteria. *Journal of PharmacyResearch* 2014,8(2),91-92

18) Meena Shamrao Deogade, Tarulata Pandya,Kethamakka Shivarama Prasad et al. Antimicrobial Activity of *Vitex NegundLinn* (*Nirgundi)* Leaves Extract, *Journal of Research inTraditional Medicine* 2015-2016|Volume 2 Issue 4

19) *Suruchi Gupta, Nilima Thosar,Sudhindra Baliga et al. International Journal of Current Advanced Research Vol 8, Issue 07(A), pp 19365-19367, July 2019*

20)Sushruta, Sushruta Samhita, Sutra Sthana, Chapter 38,Verse 18, commented by Dalhana, edited byYadavaji Trikamji Reprinted. Varanasi;Chaukhamba Sanskrit Sansthan; 2009

21)Tyler VE. Herbs of Choice: The Therapeutic Use of Phytomedicinals. Binghamton, NY: Pharmaceutical Products Press; 1994,56–57.

22) Blumenthal M, Busse WR, Goldberg A et al. (editors). TheComplete Commission E Monographs: Therapeutic Guide toHerbal Medicines. Boston, MA: Integrative Medicine Communications; 1998, 180–182.

23) Sigmund DJ, McNally EF. The action of a carminative on thelower esophageal sphincter. Gastroent 1969 56: 13–18.

24)See DM, Broumand N, Sahl L et al. In vitro effects of echinaceaand ginseng on natural killer and antibody-dependent cell cytotoxicity in healthy subjects and chronic fatigue syndrome or ac quired immunodefificiency syndrome patients. Immunpharmacol1997 35: 229–235.

25) Modarai M, Silva E, Suter A et al. Safety of herbal medicinalproducts: Echinacea and selected alkylamides do not induceCYP3A4 mRNA expression. Evid Based Complement Alternat Med 2009 Nov 11. [Epub ahead of print]

26) Della Loggia R, Tubaro A, Redaelli C. Evaluation of the activityon the mouse CNS of several plant extracts and a combination ofthem. [Article in Italian]. Riv Neurol 1981 51: 297–310.

27) Dzink JL, Socransky SS. Comparative in vitro activity of sanguinarine against oral microbial isolates. Antimicrob AgentsChemother 1985 27: 663–665.

28) Hannah JJ, Johnson JD, Kuftinec MM. Long-term clinical evaluation of toothpaste and oral rinse containing sanguinaria extractin controlling plaque, gingival inflflammation, and sulcular bleeding during orthodontic treatment. Am J Orthod DentofacialOrthop 1989 96: 199–207.

29) Frankos VH, Brusick DJ, Johnson EM et al. Safety of Sanguinariaextract as used in commercial toothpaste and oral rinse products.J Can Dent Assoc 1990 56(Suppl 7): 41–47.

30) Eversole LR, Eversole GM, Kopick J. Sanguinaria-associated oral leukoplakia. Oral Surg Oral Med Oral Pathol Oral Radiol Endod2000 89: 455–464.

31) British Herbal Medicine Association Scientifific Committee. BritishHerbal Pharmacopoeia. West Yorks, UK: British Herbal Medicine Association; 1983.

32) McGuffin M, Hobbs C, Upton R et al.(editors). American Herbal Products Association's Botanical Safety Handbook. Boca Raton,FL: CRC Press; 1997.