ISSN: 2322 - 0902 (P)
ISSN: 2322 - 0910 (O)

International Journal of Ayurveda and Pharma Research

Review Article

TULASI (*OCIUM SANTUM*) IN DENTISTRY- AN OVERLOOK

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ABSTRACT

Tulasi, 'the holy basil' is a prominent herb, that is used since the Vedic era as medicine. Currently many more systemic condition are cured through the use of various parts of this plant. This plant can be used for various diseases for treatment and maintenance of health. The oral health which could be called as indicator of systemic health is much more influenced by the use of this plant extracts.

Method- The phrase " *Tulasi* in dentistry" was searched in Google Scholar, Pubmed. 37 article were selected through criteria of inclusion, from there we selected 17 articles according to exclusion criteria.

So here in this article, the pharmacology of various parts of this plant and its use in dentistry, is explained. For health practitioners it is very useful to know the interaction of this plant with other drugs for smoothening of treatment.

Conclusion- THE study emphasized the use of various parts of the plant in dental use for treatment of diseases like caries, mucosal lesions and periodontal pathology. Along with that it can be used in root canal therapy as disinfectant irrigation. Further study is required to prescribe these extracts in dentistry.

KEYWORDS: *Tulasi*, *Ocium santum*, Eugenol, Dentistry.

INTRODUCTION

Tulasi (*Ocimum sanctum* Linn) is considered as a holy plant in mythology. It had been used since Atharb-veda time in medicinal practice. Various disorders including cardiology, neurology, psychiatry and many more had been cured by using different parts of the plant. So also the dental disorder had been successfully tried. Dental diseases are mostly chronic in nature. Diseases like dental caris, periodontitis had been of fatal concern when we consider the spreading to systemic infection. Preventive and curative measure can be taken care by this *Tulasi* extract. There had been so many research in this field, but the inclusion of all the studies till date has not been published. So this article tries to explain Pharmacognosy of plant and the uses in dental disorders.

History

In India the earliest references of use of plants in medicine appear in Rigveda 3500–1600 B.C. The properties and therapeutic uses in detail recorded in Ayurveda (The indigenous system of medicine). Medicinal plants are rich in secondary metabolites and essential oils which had been used in pharmacology. The advantages of medicinal plant use are easy availability, cost, safety and effectiveness.

In Ayurveda *Tulasi (Ocimum sanctum* L.*)* is described as Dashemani Shwasaharni (antiasthmatic) and antikaphic drugs (Kaphaghna).[1] The plants of genus Ocimum belonging to family Labiatae are very important for their therapeutic potentials. *Ocimum sanctum* L. (*Tulasi*), *Ocimum gratissium* (*Ram Tulasi*), *Ocimum canum* (Dulal *Tulasi*), *Ocimum basilicum* (*Ban Tulasi*), *Ocimum kilimandscharicum, Ocimum ammericanum, Ocimum camphora* and *Ocimum micranthum* are examples of known important species of genus Ocimum which grow in different parts of the world and are known to have medicinal properties.

METHOD

A single researcher had searched for the word '*Tulasi* in dentistry' in Google scholar, pubmed central. The outcome was 37 articles. All article were thoroughly read by two researcher and only 17 relevant article included for review.

Inclusion criteria - *Tulasi* used in dentistry for medicinal purpose describing pharmacology.

Exclusion criteria**-** Those articles are not included, which do not describe pharmacology of any of the parts of the plant.

Pharmacology of various parts of the plant

Leaves: It contains essential oils including Eugenol, Ursolic Acid, Rosmarinic Acid Bcaryophyllene, Oleanolic Acid, B-Elemene & Germacrene D, Q &–Pinene, Orientin And Vicenin. Nutritional components include Vitamin A & C, minerals calcium, iron & zinc as well as chlorophyll. [2]

Seeds contain fixed oils with Linoleic acid, Linolenic acid and Sitosterol.

Roots contain Sitosterol and three Triterpenes A,B,C

EUGENOL [3]

1. Membrane stabilizing property: neurological, inflammatory and allergic disorders
2. Anti-ulcerogenic: gastric ulcer
3. Decreases elevated blood sugar level, triglycerides, cholesterol and liver enzymes
4. Mosquito repellent and larvicidal actions particularly of seeds

ORIENTIN AND VICENIN

It is significant in giving protection to human lymphocytes against the clastogenic effect of radiation at low, non toxic concentrations.

URSOLIC ACID: (Pentacyclic triterpene acid) it is a potent COX-2 inhibitor, anti cancer activity and can inhibit Adriamycin induced lipid peroxidation.

ROSMARINIC ACID: It has anti-inflammatory & antioxidant activities.[4] It is also potential anxiolytic as it acts GABA transaminase inhibitor.

OLEANOLIC ACID OR OLEANIC ACID

They cause induction by IFN of inducible Nitric oxide synthtase and of Cyclooxygenase – 2 in mouse macrophages.

LINOLEIC ACID: It is essential fatty acid which is popular for preventing and treating diseases of the heart & blood vessels.[5]

CARYOPHYLLENE: It is a Sesquiterpene. Anti-inflammatory, and local anaesthetic, antitumor. Others are β pinene, β– Elemene etc.

These pharmacologic agents are very much useful for treating and preventing dental disorders. In fact *Tulasi* has been used as expectorant, analgesic, anticancer, antiasthmatic, antiemetic, diaphoretic, antidiabetic, antifertility, hepatoprotective, hypotensive, hyolipidimic and antistress agent. [6]

Various dental uses

1. *Tulasi* leaves are quite effective as antibacterial, so approved as food additive by FDA. [7] These can be helpful in treating common oral infections. To name some of them are as Carracrol and Tetpene & Sesquiterpene, β caryophylline. Proper Oral hygiene can be maintained with regular chewing of these leaves.

2. *Ocimum sanctum* leaves contain 0.7% volatile oil comprising about 71% eugenol and 20% methyl eugenol. Due to significant amount of Eugenol (1-hydroxyl-2 methoxy-4 allyl benzene) *Tulasi* is a strong COX-2 inhibitor. This anti-analgesic property of *Tulasi* is utilized in treatment of dental and mucosal pain. This can be attributed to inhibition of both the Cyclooxygenase and the Lipoxygenase pathways of Arachidonic acid metabolism. [8]

3. Powdered *Tulasi* leaves mixed with mustard oil can be used as toothpaste for tooth brushing. The powdered *Tulasi* leaves used to encounter halitosis and maintaining good oral health. Massages with *Tulasi* powder have reported to be highly effective in many gingival and periodontal diseases**.** [7,8]

4. Antifungal Activity. In a study conducted by Khan A et al, it was concluded that Linalool and Eugenol which are present in essential oil extracted from *Tulasi* are effective against two strains of candida (*C. albicans* and *Candida tropicalis*) but *Linalool* is more effective than Eugenol against candidasis.[9]

5. Immunomodulatory Effect: *Tulasi* have property of immune-modulation, so can also acts on skin and hemopoeitic tissues. So the *Tulasi* can be used in treatment of oral lichen planus, Pemphigous etc. However further studies are needed to evaluate efficacy of *Tulasi* in treatment of oral lichen planus.[10]

6. Anti precancerous lesion: *Tulasi* can also be used as antioxidant therapy in both leukoplakia and oral submucous fibrosis. The polyphenol rosmarnic acid is a strong antioxidant present in *Tulasi*. So it can be used in treatment of all other oral precancerous lesions and condition. [11]

7. Anti Ulcer: The anti inflammatory and immune-modulatory effect helps in curing gasto-intestinal ulcer. That is very helpful in Apthous ulcer and Pizza burn type ulcer in oral cavity. [12]

8. Nutritional supplement: It contains various vitamins like A,C,D,E,K. Which are necessary for any nutritional disorder like diabetics, Avitaminosis etc. [13]

9. Periodontal disorder: Powdered *Tulasi* leaves can be used for brushing, gum massage for healthy gum and curing Gingivitis. Mouth rinse prepared by various dilution from leave extract has been found to be equally effective compared to Chlorohexidine mouthwash 0.12%.[14]

10. As a root canal irrigant: A study by Subbiya et al concludes that the *ocium* santum leave extracts are very much effective against E.fecalis, the root canal pathogen.[15,16] From an in vivo study by Prabhakar AR et alit has been concluded that in Pedodontics also 4% *Tulasi* extract can be considered as a potential irrigant.[17]

CONCLUSION

The Holy Basil (*Ocium santum*) has been proven to be curative of various systemic disorders. It can be used as anti hypertensive, anti diabetic, stress relieving agent, Syndome X, anti cancer, anti-inflammatory etc. This promising herb has been used in dentistry for various purposes. So it is the time we can go for phase 2 or phase 3 clinical trials for the curative & preventive action. Most of the dental diseases are infectious and inflammatory. Thus it gives the promising action of the wonder herb *Tulasi*.

Indian science since the ancient era has proven the use *Tulasi* for oral diseases, so for dental purpose many studies are required to have a factual answer of some unanswered questions like side effect. The postgraduate and under graduate student should have a curriculum such that, this will promote the Indian Ayurvedic science and ancient Indian text for the use of the Holy Basil in dentistry.

REFERANCES

1. Sirkar NN. Pharmacological basis of Ayurvedic therapeutics. In: Cultivation and utilization of medicinal plants. Editors: Atal CK and Kapoor BM (Published by PID CSIR) 1989.
2. Pattanayak P, Behera P, Das D, Panda S K. Ocimum sanctum Linn. A reservoir plant for therapeutic applications: An overview; Pharmacogn Rev. 2010 Jan-Jun; 4(7): 95–105. doi: 10.4103/0973-7847. 65323 PMCID: PMC3249909.
3. Shukla A, Kaur K, Ahuja P. Tulsi the Medicinal Value. Online International Interdisciplinary Research Journal; 2013; 3:9-14.
4. Kelm MA, Nair MG, Strasburg GM, DeWitt DL. Antioxidant and cyclooxygenase inhibitory phenolic compounds from Ocimum sanctum Linn. Phytomedicine. 2000; Mar;7(1):7-13.

5. Sandip I. Vidhani et al. Evaluation of Some Chemical Composition, Minerals Fatty Acid Profiles, antioxidant and Antimicrobial Activities of Tulsi (Ocimum sanctum) from India. American Journal of Food Science and Technology. 2016,4(2): 52-57. http://pubs.sciepub.com/ajfst/4/2/5.
6. Sen P. Therapeutic potentials of Tulsi : from experience to facts. Drugs News & Views 1993; 1(2): 15–21.
7. Agarwal P, Nagesh L, Murlikrishnan. Evaluation of the antimicrobial activity of various concentrations of Tulsi (ocimum sanctum) extract against streptococcus mutans: Ind J Dent Res. 2010; 21(3): 357-59.
8. Singh SA, Majumdar DK, rehan HMS. Evaluation of anti-inflammatory potential of fixed oil of Ocimum sanctum(Holy basil) and its possible mechanism of action. J Ethnopharmacol 1996;54:19-26.
9. Khan A, Ahmed A, Manzoor N and Khan L A. Antifungal activities of Ocimum sanctum essential oil and its lead molecules. Natural products communications 2010;5(2):345-349.
10. Mediratta PK. Evaluation of immunomodulatory potential of Ocimum sanctum seed oil and its possible mechanism of action. J Ethnopharmacol 2002;80:15-20.
11. Srivastava A, Agarwal R, Chaturvedi TP, Chandra A, Singh OP. Clinical evaluation of the role of Tulsi and turmeric in the management of oral submucous fibrosis: A pilot, prospective observational study. Journal of Ayurveda and Integrative Medicine. 2015;6(1):45-49. doi:10.4103/0975-9476.146563.
12. Dharmani P. Evaluation of anti-ulcerogenic and ulcer-healing properties of Ocimum sanctum Linn. J Ethnopharmacol 2004;93:197-206.
13. Chopra RN, Chopra IC, Handa KL, Kapoor LD. Indigenous drugs of India (Published by UN Dhar, Pvt. Ltd., Calcutta) 1993.
14. Gupta D, Bhaskar DJ, Gupta RK, Karim B, Jain A, Singh R, et al. A randomized controlled clinical trial of Ocimum sanctum and chlorhexidine mouthwash on dental plaque and gingival inflammation. J Ayurveda Integr Med 2014;5:109-16.
15. Subbiya A, Mahalakshmi K, Pushpangadan S, Padmavathy K, Vivekanandan P, Sukumaran VG. Antibacterial efficacy of Mangifera indica L. kernel and Ocimum sanctum L. leaves against Enterococcus faecalis dentinal biofilm. Journal of Conservative Dentistry : JCD. 2013;16(5):454-457. doi:10.4103/0972-0707.117507.
16. Chandrappa PM, Dupper A, Tripathi P, Arroju R, Sharma P, Sulochana K. Antimicrobial activity of herbal medicines (Tulsi extract, neem extract) and chlorhexidine against Enterococcus faecalis in Endodontics: An in vitro study. Journal of International Society of Preventive & Community Dentistry. 2015;5(2):S89-S92. doi:10.4103/2231-0762.172952.
17. Prabhakar AR, Krishna Murthy VVR. Vallu, Yavagal C. Ocimum Sanctum as an Intracanal Irrigant in Contemporary Paediatric Endodontics – An In Vivo Study. Int J Oral Health Med Res. 2015;2(4):6-9.

Cite this article as:
Sunil Kumar Rath, Sriram kirti bhuyan, Choudhury Sabyasachi Swain, Subhashree Manaswini Panda. Tulasi (Ocium Santum) In Dentistry- An Overlook. International Journal of Ayurveda and Pharma Research. 2017;5(5):86-88.
Source of support: Nil, Conflict of interest: None Declared

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