Therapeutic Effects of Tulsi (Ocimum Sanctum Linn) in General and Oral Health

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ABSTRACT

The purpose of the paper was to review the diverse pharmaceutical aspects of Tulsi plant in treatment of various medical and oral disorders. Many scientific studies have indicated that Tulsi (Ocimum sanctum L.) has antistress, antioxidant, immunomodulating and antinflammatory properties. Tulsi has an extensive array of medicinal uses, but its use in allopathic medicine is still limited because of lack of clinical trials on humans. Key words: Ocimum sanctum L. (Tulsi), Immunomodulator

Morphological types:

Commonly, there are three types of Tulsi, one with a purple-colored leaf or dark variety, commonly known as the Shyama or Krishna Tulsi and the second type with a green-colored leaf or light variety known as Rama Tulsi or Sri Tulsi. Rama Tulsi is regularly used for worshiping and is more...
common of the three types. A third type, commonly known as Vana Tulsi (or forest Tulsi), is O. gratissimum.¹

**Active components of Tulsi**

Eugenol is identified as one of the major active constituent and is reported to possess myriad benefits. Tulsi is also reported to possess caryophyllene, eugenol methyl ester, terpinene-4-ol, (+)-8-cadinene, 3-carene, alpha-humulene, citral, (−)-trans caryophyllene, eugenol, 6-allyl-3’,8-Dimethoxyflavan 3,4’-diol, 6-allyl-3-(4-allyl-2-methoxyphenoxyn)-3’,8-dimethoxyflavan 4’-ol, 5-allyl-3-(4-allyl-2-methoxyphenoxymethyl)-2-(4-hydroxy-3-methoxyphenyl)-7-methoxy-2,3-dihydrobenzofuran, 1,2-bis (4-allyl-2-methoxyphenoxy)-3-(4-hydroxy-3-methoxyphenyl)-3-methoxylpropane, 1-(4-hydroxy-3-methoxyphenyl)-1,2,3-tris (4-allyl-2-methoxyphenoxyn) propane, 1-allyl-4-(5-allyl-12-hydroxy-3-ethoxyphenoxyn)-3-(4-allyl-2-methoxyphenoxyn)-5-methoxybenzene, 3 (5 allyl-2-hydroxy-3-ethoxyphenyl)-1-(4-hydroxy-3-methoxyphenoxyn)-prop-1-ene, α-pinene, β-pinene, α-camphor, carvacrol, luteolin, limatrol, methylchavicol, caryophylline, cirsilineol, decyladehyde, cirsimaritin, isothymusin, isoymonin, apigenin, rosmarine acid and cervacrol.³

**Pharmacological uses and health benefits**

In the ancient Ayurvedic text, the Charaka Samhita, Tulsi has been documented to be of immense use in the treatment of headaches, rhinitis, stomach disorders, inflammation, heart diseases, various forms of poisoning and malaria.² Each part of the plant has proven to offer protection against various diseases; the aqueous and alcoholic extract from the leaves have various pharmacological activities such as anti-inflammatory, antipyretic, analgesic, antiasthmatic, antiemetic, anti diabetic, hepatoprotective, hypotensive, hypolipidemic, and antistress agents. Further, distillation of the leaves yields oil of the plant which is known to possess antibacterial, antioxidant, and anti inflammatory properties and is used extensively in the pharmaceutical industry mainly for skin cream preparations.³
1. Antimicrobial activity: Tulsi is known to possess antimicrobial activity against various bacteria, the most common being Candida albicans, Staphylococcus aureus, Escherichia coli by its phytoconstituents isolated from various parts. 

2. Immunomodulatory activity: Tulsi strengthens the immune response by enhancing both cellular and humoral immunity by boosting the cell mediated immune responsiveness and gamma amino butyric acid (GABA) pathways. 

3. Anti-inflammatory activity: The fixed oil and linolenic acid possess significant anti-inflammatory activity against prostaglandin E2, leukotriene and arachidonic acid by virtue of their capacity to block both the lipoxygenase and cyclooxygenase pathways of arachidonic acid metabolism. 

4. Adaptogenic activity / Antistress activity: Tulsi has antihypoxic effect and it increases the survival time during anoxic stress. A study done on rabbits showed that Tulsi has tremendous ability to reduce the oxidative stress produced in the body. 

5. Antidiabetic activity: Oral administration of Ocimum sanctum extract led to a marked lowering of blood sugar in normal. It has an aldose reductase activity, which may help in reducing the complications of diabetes such as cataract, retinopathy, etc. 

6. Antifungal activity: Tulsi extract has been effective against filamentous fungi which include Aspergillus Niger, A. fumigatus, A. Aavus, Rhizopus stolonfera and penicillium digitatum. The fungicidal activity is said to be due to the action of secondary metabolites which are present in tulsi including alkaloids, glycosides, saponins, tannins ascorbic acids eugenol and various other metabolites. 

7. Anticoagulant activity: Linolenic acid present in the Ocimum Sanctum fixed oil is metabolised to eicosapentaenoic acid (EPA). EPA through cyclooxygenase pathway produces PG13 and Thromboxane A3 (TXA3) inhibiting the production of TXA2.

**Role of Tulsi (O. Sanctum) in General medicine**

1. Respiratory disorders: Water boiled with tulsi leaves is taken in case of sore throat. For immediate relief of influenza the leaves are taken with cloves with common salt. The leaves of tulsi are very helpful in curing common cold and fever. Tulsi leaves along with powdered cardamom can be used to bring down the fever decoction of leaves is used for common cold.

2. Ocular disorders: The leaf juice of tulsi along with triphala is used to cure, glaucoma, cataract and conjunctivitis.

3. Cardiovascular disorders: Eugenol extracted from tulsi leaves act as a vasodilator and also reduces the blood cholesterol level.

4. Renal disorders: Tulsi leaves if taken with honey helps in treatment of renal calculi. Seeds of the tulsi plants has been reported to reduce blood and urinary uric acid levels.

5. Dermatological disorders: Local application of Ocimum sanctum L. (tulsi) leaves juice is beneficial in treatment of ringworm. Tulsi cream is useful in treatment of leukoderma.

6. Gastrointestinal disorders: Aqueous decoction of Ocimum sanctum L. (tulsi) leaves is given to patients suffering from gastric and hepatic disorders. It is helpful as a mild laxative and has been prove to posses anthelmintic properties.

**Oral implications of Tulsi**

1. Intra canal irrigant: *O. sanctum* is an anti bacterial in activity and in
concentration of 4%. It can be used safely as an intracanal irrigant as compare to sodium hypochlorite. It is bio friendly and no burning sensations reported to oral tissues.\(^1\)

2. Oral Candidiasis

*O. sanctum* has been effective against candida species and filamentous fungi like Aspergillus and rhizopus. The antifungal activity of *Ocimum sanctum* L. is due to the action of secondary metabolites like alkaloids, glycosides, saponins, tanins, ascorbic acids and eugenol.\(^1\)

3. Toothache

The leaves of *Ocimum.s* can act as modern analgesic as it contains a considerable amount of eugenol which which acts as cyclooxygenase (cox-2) inhibitor.\(^2\)

4. Anticariogenic agent

An in vitro study revealed various concentration of *ocimum*. S extracts were assess against streptococcus mutans, the main causative agent of caries. The 4% concentration of *Ocimum sanctum* L. has a maximum anti cariogenic potention.\(^3\)

5. Prevention of oral cancer

*Ocimum sanctum* L. is an excellent anticancer agent. Administration of ocimum sanctum has been shown to decrease the incidence of oral cancer by decreasing the levels of cytokeratin, CK (infiltration), vascular endothelial growth factor, VEGF (angiogenesis), proliferating cell nuclear antigen (PCNA), glutathione-s-transferase pi (key proteins involved in proliferation), and antiapoptotic protein Bcl-2 factors. Studies suggest that the leaf extract of ocimum.s suppresses the biochemical events associated with chemical carcinogenesis.\(^4\)

6. Radioprotective activity

*Ocimum sanctum* L. leaves showed better radio protective effect as compare to synthetic radio protectors. The leaf extract lead to higher bone marrow protection and reduction in the toxicity WR-2721 (synthetic radio protector).\(^5\)

7. Aphthous stomatitis

*Ocimum sanctum* L. at a dose of 100 mg/ kg was found to be effective anti ulcer agent due to it cyto protective effect.\(^6\)

8. Treatment of oral mucosal lesions.

*Ocimum sanctum* L. leaves has unique property of immune modulation therefore it is used in treatment of various oral lesions like oral lichen planus, *Ocimum sanctum* L. Juice is beneficial. In oral leukoplaika and oral sub mucous fibrosis, *Ocimum sanctum* L. acts as a powerful antioxidant due to Polyphenol rosmarinic acid. In oral pemphigus it can be used in healing of vesicles and bullae.\(^7\)

9. Periodontal diseases

*Ocimum sanctum* L. leaves dried in sun and powdered can be used for brushing teeth this can also be used for massaging the gingival to treat various gingival and periodontal diseases.\(^8\)

**Conclusion**

Tulsi (*Ocimum sanctum* L.) is regarded as “Queen of herbs” because of its various medicinal properties. Various pharmacological studies, have established a scientific basis for therapeutic uses of this plant. Therefore, we recommend further studies should be directed to explore the therapeutic significance of this miraculous plant in general and oral health.

**References**


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