

# The Pharmacotherapeutic Activity of Ocimum Sanctum (Tulasi) - A Review

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**Abstract:** *Tulsi (Ocimum sanctum L.), which is native to the Indian subcontinent, is highly revered for its therapeutic use in both ayurveda and siddha medicine. Ocimum sanctum Linn. (Tulasi), a sacred and traditional medicinal plant of India which possesses innumerable health benefits and therefore regarded as the "Elixir of Life", 'Incomparable one' 'Machless one' and 'Queen of Herbs'. Many research and studies suggest that Tulasi may be a COX-2 inhibitor, like many modern painkillers, due to its significant amount of eugenol. The research suggests that tulsi is a potential therapy option for way of life and is stronger than conventionally utilised methods.*

**Keywords:** Tulasi, Lamiaceae, Ocimum sanctum, Pharmacotherapeutic activity, Taxonomical studies

## 1. Introduction

Tulasi consists of dried leaf of *Ocimum sanctum* Linn. (Fam. Lamiaceae), an erect, 30-60 cm high, much branched annual herb, found throughout the country. <sup>(2)</sup> Tulsi (Holy Basil) is an important symbol of the tradition considering the hind religion. Tulsi has another name called Vishnupriya, which means a person who pleases Lord Vishnu. In India, Tulsi is found in most houses and worshipped by all the Indians. In Ayurveda, Tulsi has been used for thousands of years for its diverse healing properties. <sup>(4)</sup>



Figure 1: Plant of *Ocimum sanctum* (Tulasi)

### Synonyms:

Sansk: Surasa, Kruatulasi, Bana Tulasi  
Assam: Tulasi  
Beng: Tulasi  
Eng: Holy Basil, Sacred Basil  
Guj: Tulasi, Tulsi  
Hindi: Tulasi  
Kan: Tulasi  
Kash:--  
Mal: Tulasi  
Mar: Tulas  
Ori:--

Punj: Tulasi

Tam: Tulasi, Thulasi

Tel: Tulasi

Urdu: Raihan, Tulsi

### Description

#### a) Macroscopic:

Leaves 2.5-5 cm long, 1.6-3.2 cm wide, elliptic-oblong, obtuse or acute, entire or serrate, pubescent on both surfaces, petiolate, thin, petiole 1.5-3 cm long, hairy, odour aromatic, taste, characteristic. <sup>(2)</sup>



Figure 2: *Ocimum sanctum* (Tulasi) Leaf

### Taxonomy <sup>(9)</sup>

Kingdom: Plantae  
Subkingdom: Tracheobionta  
Superdivision: Spermatophyta  
Division: Magnoliophyta Class: Magnoliopsida  
Subclass: Asteridae  
Order: Lamiales  
Family: Lamiaceae  
Genus: *Ocimum*  
Species: *O. sanctum*

### 1. Health Benefits of Tulsi in Our Daily Life: <sup>(1)</sup>

- Healing Power

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- Fever and Common Cold
- Coughs
- Sore Throat
- Respiratory Disorder
- Kidney Stone
- Heart Disorder
- Children's Ailments
- Stress
- Mouth Infections
- Insect Bites
- Skin Disorders
- Teeth Disorder
- Headaches
- Eye Disorders

## 2. Medicinal properties Heart disease can be treated with tulsi: <sup>(6)</sup>

- Tulsi reduces Blood Pressure.
- Diabetics benefit from tulsi.
- Total cholesterol levels are decreased by tulsi.
- Tulsi lowers blood glucose levels and contains antioxidant effects.
- It had occasionally been used as an antispasmodic for whooping cough.
- It helps with cramps in the stomach.
- Vomiting, diarrhoea, constipation, and enteritis are symptoms of gastrointestinal catarrh. Basil has digestive, carminative, galactagogue, antispasmodic, and appetiser properties.

### Pharmacotherapeutics Activity:

1. **Anti-Inflammatory:** The fresh tulsi leaf in its paste form was tested for anti-inflammatory activity using carrageenan induced paw edema model in comparison to Indomethacin. The percent inhibition of 500 mg/kg of the tulsi paste was found to be 88.15% as that of the response observed with 100 mg/kg of indomethacin and showed considerable anti-inflammatory activity. <sup>(9)</sup>
2. **Antimicrobial Activity:** The main etiological agents of dental caries are *Streptococcus mutans* and *Lactobacillus acidophilus*. They can easily colonize the tooth surface and initiate acid production by synthesizing extracellular polysaccharides from sucrose foods. The reduction of bacteria associated with caries in the dental plaque is a major preventive strategy. Caries is a global public health problem, whose control requires the introduction of low cost treatments, such as strong prevention strategies, minimally invasive techniques and chemical prevention agents. [4] Nature has been a source of medicinal treatments for thousands of years and plant-based Akshatha Gadiyar et al. Evaluation of the Antimicrobial Activity of *Ocimum Sanctum* L. (Tulsi) Extract Against *Streptococcus Mutans* and *Lactobacillus Acidophilus* - An in Vitro Study International Journal of Health Sciences & Research (www.ijhsr.org) 225 Vol.7; Issue: 4; April 2017 systems continue to play an essential role in the primary health care of 80% of the world's underdeveloped and developing countries. <sup>(7)</sup>

3. **Immuno modulatory:** It is essential for the body to contain an immune-modulator that stabilizes, restores and keeps the immune system operating in a healthy, balanced manner. Tulsi has great immune-boosting qualities that shield the body from external substances like germs, viruses, pathogens, allergies, etc., maintaining the body's general equilibrium. <sup>(6)</sup>
4. **Antidiabetic Activity:** Present findings provide an experimental justification to the traditional use of this plant for the management of hyperglycemia and provide preliminary insight into the possible mechanisms through which *O. sanctum* may aid to overcome diabetes and associated complications. <sup>(10)</sup> Oral administration of OS extract led to marked lowering of blood sugar in normal, glucose-fed hyperglycemic and streptozotocin-induced diabetic rats. A randomized, placebo-controlled, cross over single blind human trial indicated a significant decrease in fasting and postprandial blood glucose levels by 17.6% and 7.3%, respectively. <sup>(11)</sup>
5. **Anticancer Activity:** OS L. or OT L contains phytochemicals such as eugenol, rosmarinic acid, apigenin, myrethenal, luteolin,  $\beta$ -sitosterol, and carnolic acid prevented chemical-induced skin, liver, oral, and lung cancers and to mediate these effects by increasing the antioxidant activity, altering the gene expressions, inducing apoptosis, and inhibiting angiogenesis and metastasis. <sup>(3)</sup> Detoxification of carcinogens and mutagens which is carried out by enzymes such as glutathione-S-transferase, cytochrome b5 and cytochrome P450, and aryl hydrocarbon hydroxylase is modulated by the alcoholic extract (AIE) of leaves of *O. sanctum*. The anticancer activity of Tulsi has been reported against human fibrosarcoma cells culture, wherein AIE of the drug induced cytotoxicity at 50 mg/ml and above. <sup>(9)</sup>
6. **Memory Enhancer:** To study the antedementia and anticholinesterase activity, the aqueous and alcoholic extract of the leaves of *O. sanctum* were studied in rats. Atropine, cyclosporine, and electroshock were used to activate dementia. It was reported that the inactive restraint was used to assess memory <sup>(12)</sup>
7. **Antioxidant Effect:** A hydroalcoholic extract of OS leaves has been investigated for its antioxidant activity in animal models of peptic ulcer with the aim of exploring a possible correlation between its antioxidant and antiulcer activities. <sup>(9)</sup>
8. **Hepatoprotective Activity:** It was reported that the leaf extract of the *O. sanctum* plant possesses significant hepatoprotective activity when studied against paracetamol-induced liver damage against albino rats. <sup>(12)</sup>
9. **Anti-helminthic Activity:** The essential oil of *Ocimum sanctum* and eugenol, tested in vitro, showed potent anthelmintic activity in the *Caenorhabditis elegans* model <sup>(9)</sup>

**10. Antibacterial:** These extraordinary plant's antibacterial components include carvacrol and terpene. Additionally, sequiterpene Bcaryphyllene does the same feat. This ingredient is a food additive that has received FDA approval and is found naturally in tulsi. It assists in protecting the body from bacteria that cause sickness. <sup>(8)</sup>. Biochemical compounds present in methanolic Tulsi leaf extract showing antimicrobial activity against human and fish pathogens were carried out using *Bacillus* sp, *E. coli*, *Streptococcus*, *Bacillus subtilis*, *Bacillus cereus*, *Staphylococcus aureus*, *Vibrio cholera*, *Salmonella typhi*, *Klebsiella pneumonia*, *Salmonella paratyphi* and Fish pathogens *Aeromonas hydrophila*, *Pseudomonas aeruginosa*, *Edwardsiella tarda*. Maximum antibacterial activity exhibited against *Bacillus* sp. and moderate activity in *Bacillus subtilis*, *Bacillus cereus*, *Vibrio cholera*, *Salmonella typhi*. <sup>(9)</sup>

## 2. Conclusion

Herbal plants are used in Indian for treating and curing various disease because of their high value. Tulsi (*Ocimum sanctum*) is considered a holy plant. It was reported in various research studies that the *Ocimum sanctum* plant contain therapeutical properties including Anticancer, antidiabetic, antiinflammatory, antioxidant, antimicrobial, Antibacterial and Hepatoprotective activity. Conclusively from various repeated scientific studies that the Tulsi plant has great medicinal importance and is used worldwide to treat various diseases.

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