



Review Article

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THERAPEUTIC BENEFITS OF HOLY BASIL (TULSI) IN GENERAL AND ORAL MEDICINE: A REVIEW

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ABSTRACT

Nature has bestowed on us a very rich botanical wealth and a large number of diverse types of plants grow in different parts of the country. Plants are the richest resource of drugs in traditional systems of medicine, modern medicines, nutraceuticals, food supplements, folk medicines, pharmaceutical intermediates and chemical entities for synthetic drugs. Medicinal plants are a source of great economic value all over the world. *Ocimum sanctum* Linn (*Tulsi*) is a well-known plant used in the Indian system of medicine. This paper reviews the therapeutic potential of this plant in treatment of various medical and oral disorders.

Keywords: Tulsi, *Ocimum sanctum* Linn, Oral medicine, Medicinal plant

INTRODUCTION

In recent times, focus on plant research has increased all over the world and a large body of evidence has collected to show immense potential of medicinal plants used in various traditional systems. The use of plants and plant products as medicines could be traced as far back as the beginning of human civilization. The earliest mention of medicinal use of plants in Hindu culture is found in “Rigveda”, which is said to have been written between 4500 - 1600 BC and is supposed to be the oldest repository of human knowledge.¹ Today the large number of drugs in use are derived from plants, like morphine from *Papaver somniferum*, Aswagandha from *Withania somnifera*, Ephedrine from *Ephedra vulgaris*, Atropine from *Atropa belladonna*, Reserpine from *Rauwolfia serpentina* etc. The medicinal plants are rich in secondary metabolites (which are potential sources of drugs) and essential oils of therapeutic importance. The important advantages claimed for therapeutic uses of medicinal plants in various ailments are their safety besides being economical, effective and their easy availability.^{2,3}

Ayurveda, which means science of long life, is at least a 5000 year old system of Indian medicine (1500–1000 BC) designed to promote good health and longevity rather than to fight disease and was practiced by physicians and surgeons (called bhashaja or vaidya). Until 700 B.C. this science was orally discussed between sages and physicians.⁴ In Ayurveda, Tulsi has been well documented for its therapeutic potentials and described as Dashemani Shwasaharni (antiasthmatic) and Kaphaghna (Anti-cough).²

Tulsi's History and Mythology in India

Tulsi in Sanskrit means “one that is incomparable or matchless”. Tulsi was recognized thousands of years ago by ancient Rishis to be one of the India's greatest healing herbs. They saw this herb is so good for health and

healing that it was declared as a God in itself. Tulsi is a herb with its own mythological background. It is supposed to be beloved of Lord Krishna, a reincarnation of Lord Vishnu. Tulsi was then established as one of the eight indispensable items in any Vedic worship ritual to ensure that every house and temple had atleast one Tulsi bush in its proximity. Still today Tulsi can be found planted in most homes in India and is most respected and honored herb due to its continuing importance in healing, religion, spirituality, culture and decorative aesthetics. It is so readily found now even in the West that one of its names is Sulabha ‘the easy obtainable on’.⁵

Ocimum sanctum Linn (Tulsi): A plant from genus *Ocimum*

Among the plants known for medicinal value, the plants of genus *Ocimum* belonging to family Labiatae are very important for their therapeutic potentials. *Ocimum sanctum* L. (Tulsi), *Ocimum gratissimum* (RamTulsi), *Ocimum canum* (Dulal Tulsi), *Ocimum basilicum* (Ban Tulsi), *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. *Ocimum sanctum* L. known as ‘Tulsi’ in Hindi and ‘Holy Basil’ in English is an erect softy hairy aromatic herb or undershrub found throughout India. Tulsi is commonly cultivated in gardens. Two types of *Ocimum sanctum* L. are met within cultivation: (i) Tulsi plants with green leaves known as ‘Sri Tulsi’ and (ii) Tulsi plants with purple leaves known as ‘Krishna Tulsi’. *Ocimum sanctum* L. is held sacred by Hindus and is used as medicinal plant in day to day practice in Indian homes for various ailments.^{6,7}

Pharmacological Actions

Several medicinal properties have been attributed to *Ocimum sanctum L.* Different parts of Tulsi plant e.g. leaves, flowers, stem, root, seeds etc. are known to possess therapeutic potentials and have been used by traditional medical practitioners as expectorant, analgesic, anticancer, antiasthmatic, antiemetic, diaphoretic, antidiabetic, antifertility, hepatoprotective, hypotensive, hypolipidmic and antistress agents. Tulsi has also been used in treatment of fever, bronchitis, arthritis, convulsions etc.⁸The following section discusses its various therapeutic uses in medicine and dentistry.

MEDICAL USES

Gastrointestinal Disorders

Aqueous decoction of Tulsi leaves is given to patients suffering from gastric and hepatic disorders.^{6, 9} Herbal preparations containing *Ocimum sanctum L.* have been suggested to shorten the course of illness, clinical symptoms and biochemical parameters in patients suffering from viral hepatitis. Effective in increasing the peristaltic movements of GI tract. It is helpful in improving appetite. Also have some mild laxative properties therefore helps in evacuation of the bowel and maintenance of a healthy bowel.⁹ The juice of fresh leaves is also given to patients to treat chronic fever, dysentery, hemorrhage and dyspepsia.^{6,9} Tulsi leaves also check vomiting and has been as anthelmintic. Gastric ulceration and secretion are reported to be inhibited by Tulsi in albino rats.^{8,10}

Eye (Ocular) Disorders

The leaf juice of *Ocimum sanctum L.* along with Triphala is used in Ayurvedic eye drop preparations recommended for glaucoma, cataract, chronic conjunctivitis and other painful eye diseases.^{6,9}

Cardiovascular Disorders

It has beneficial effect in cardiac diseases and the weakness resulting from the various cardiac disorders. It even reduces the level of blood cholesterol. Eugenol (extracted from Tulsi leaves) has been well shown to possess the vaso-relaxing action on rabbit arterial tissue indicating its therapeutic importance as a vasodilator.^{11,12}

Respiratory Disorders

Tulsi is very effective in treating the common cold. A decoction of the leaves, with honey and ginger is an effective remedy for bronchitis, bronchial asthma, influenza, cough and cold. For the immediate relief in cases of Influenza the decoction of the leaves, cloves and common salt also gives immediate relief within the case of influenza. Tulsi is important constituent of many Ayurvedic cough syrups and expectorants. It helps to mobilize mucus in bronchitis and asthma thus is very beneficial for maintenance of a very healthy respiratory passage. Chewing Tulsi leaves relieves cold and flu. Water boiled with Tulsi leaves is taken as to drink in case of sore throat. This water can also be used for the purpose of gargles.^{8,13}

Renal Disorders

Tulsi has strengthening effects on the kidney. In cases of renal stone the juice of Tulsi leaves and honey, if taken regularly for 6 months it will expel them through the urinary tract. Leaves and seeds of Tulsi plants have been

reported to reduce blood and urinary uric acid level in albino rabbits and possess diuretic property.¹⁴ The fresh leaves and flower tops of *Ocimum sanctum L.* have been used as antispasmodic agent (as smooth muscle relaxant).^{6,8} The seeds are mucilaginous and demulcent and are given in disorders of the genitourinary system.⁶

Dermatological Disorders

Applied locally, Tulsi juice is beneficial in treatment of ringworm and other skin diseases. It is also very beneficial in skin disorders such as leucoderma.⁸

Psychological Disorders

Tulsi leaves are regarded as an “adaptogen” or antistress. Recent studies have shown that leaves provide its user with significant protection against stress. Even healthy persons can chew 12 leaves of Tulsi, twice a day to prevent stress. It even purifies the blood and helps prevent several common psychological disorders.¹⁵

Diabetes Mellitus

The leaves of Tulsi plant contain various essential oils within them. It is therefore very useful in improving pancreatic beta cell function and thus enhancing the insulin secretion to keep a check over the blood sugar within the patients suffering by diabetes.¹⁶

Inflammatory Disorders

Tulsi inhibits inflammation causing enzymes in our bodies which contribute to pain and other signs of inflammation. The anti-inflammatory effects of Tulsi are comparable to ibuprofen, naproxen and aspirin. Tulsi even enhances the adrenal function by lowering cortisol levels. This results in reducing the negative effects of stress. Tulsi is very effective in suppressing any kind of edema that happening in the body. It improves blood circulation in the body therefore helpful in dealing with any kind of swellings in the body.¹⁷

Antifertility effect

The leaves of *Ocimum sanctum L.* are said to have abortifacient effect in women. *Ocimum sanctum L.* has also got antifertility effect. Ursolic acid, one of the major constituents of the Tulsi leaves has been suggested to possess antifertility effect in rats of both sexes and in male mice. Ursolic acid because of its anti-estrogenic effect reduces spermatogenesis and causes a decrease in sperm counts.^{18,19}

Antitumor effect

The seed oil of *Ocimum sanctum* was evaluated for chemo-preventive activity against subcutaneously injected 20 –methylcholanthrene induced fibrosarcoma tumors in the thigh region of Swiss albino mice. Supplementation of maximal tolerated dose (100 ml/kg body weight) of the oil significantly reduced 20-methylcholanthrene induced tumor incidence and tumor volume. The results of this study suggest that the potential chemopreventive activity of the oil is partly attributable to its antioxidant properties. The chemo-preventive efficacy of 100 ml/kg seed oil was comparable to that of 80 mg/kg of vitamin E.²⁰

Oro-Dental Uses

Oral Infections

Tulsi leaves are quite effective in treating common oral infections. Also few leaves chewed help in maintaining oral hygiene. Carracrol and Tetpene are the antibacterial agents present in this plant. Sesquiterpene b-caryophyllene also serves the same purpose. This

constituent is FDA approved food additive which is naturally present in Tulsi.²¹

Toothache

Tulsi can act as COX-2 inhibitor, like modern analgesics due to its significant amount of Eugenol (1 - hydroxyl - 2methoxy - 4 allyl benzene) *Ocimum sanctum* leaves contain 0.7% volatile oil comprising about 71% eugenol and 20% methyl eugenol.²²

Periodontal Disorders

Tulsi leaves dried in sun and powdered can be used for brushing teeth. It can also be mixed with mustard oil to make a paste and used as toothpaste. This is very good for maintaining dental health, counteracting oral malodor (halitosis). This can also be used for massaging gingiva to treat various gingival and periodontal diseases.^{21,22}

Anticariogenic Agent

Streptococcus mutans is a microorganism which has been well implicated in causing dental caries. In an in-vitro study the various concentrations of the Tulsi extracts have been assessed against *streptococcus mutans* and concluded that the composition of Tulsi extract 4% has a maximum antimicrobial potential.²¹

Candidiasis

The antifungal activity of the essential oil of *Ocimum sanctum* and its two main components i.e. Eugenol and linalool have been investigated against two species of *Candida* (i.e. *C. albicans* and *C. tropicalis*) which are known to causes oral candidiasis in a study and concluded that linalool is more promising and effective against candidia.²³

Lichen planus

Ocimum sanctum have the unique property of acting on the skin and blood tissue and also bring about the desired immunomodulation and it one of the treatment options in Ayurveda for treating lichen planus.²⁴

Leukoplakia and Oral Submucous Fibrosis

Polyphenol rosmarinic acid present in Tulsi can act as a powerful antioxidant so this property can therapeutically utilized in treating common oral precancerous lesions and conditions.^{25,26}

Pemphigus

Ayurvedic treatment aims at boosting the immune system and promotes healing of the blisters and sores. Due to its immunomodulating property *Ocimum sanctum* may find its potential use in treating immunologically mediated mucosal condition like pemphigus.²⁷

Apthous Ulcerations

Ocimum sanctum at a dose of 100 mg/kg was found to be effective antiulcer agent in a study. Anti-ulcer effect of *Ocimum sanctum* may be due to its cytoprotective effect rather than antisecretory activity. Conclusively *Ocimum sanctum* is found to possess potent anti-ulcerogenic as well as ulcer-healing properties and could act as a potent therapeutic agent against peptic ulcer disease. This property may also prove beneficial in oral ulcers.²⁸

Nutrient

Tulsi contains Vitamin A and C, calcium, zinc and iron. It also has chlorophyll and many other phytonutrients. Deficiency of these nutrients has been associated with variety of oral diseases.²⁹

CONCLUSION

Therapies involving plants have existed for thousands of years and some may be as old as human civilization itself. One such medicinal plant is “Tulsi” which is regarded as the “Queen of Herbs” because of its varied medicinal properties and mythological value too. Several pharmacological studies have established a scientific basis for therapeutic uses of this plant. Traditionally it has been used for treating various systemic conditions in Ayurveda. It can prove beneficial in treating oral diseases also because of its antibacterial, antiinflammatory, ulcer healing, antioxidant, immunomodulatory properties. Future studies should be directed to explore and evaluate therapeutic significance of this miraculous plant in oral medicine.

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