

# TULSI: THE SERVICEABLE MEDICINAL PLANT

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**Abstract—** For many thousands of years, there are many medicinal plants which have been used to cure diseases throughout the world. One such plant is Tulsi (*Ocimum sanctum*) which have several medicinal properties .Tulsi plant is used not only in Ayurveda and Siddha but also in Greek, Roman and Unani systems of medicine. Tulsi is used as anti-asthmatic and anti-kaphic drugs. It is also used in treatment of fever, bronchitis, arthritis, convulsions and in periodontitis it influences cytokine production and has an immune modulatory effect .Tulsi extracts are used as oral rinses. This article outline the present knowledge of pharmacological and other studies of this plant and its various possible applications in medicine and to pave the way for future studies in its applications in medicine.

**Index terms-** medicinal plants, Tulsi (*Ocimum sanctum*), anti-asthmatic and anti-kaphic drugs.

## I. INTRODUCTION

Plants are the primary source of medicine. Medicinal plants are considered to be very rich sources of secondary metabolites and oils which are of therapeutic importance. The therapeutic uses of plant are safe, economical & effective as their ease of availability [1]. the plants of genus *Ocimum* belonging to family Lamiaceae are very important for their therapeutic potentials. *Ocimum sanctum* has two varieties i.e. black (Krishna Tulsi) and green (Rama Tulsi), their chemical constituents are similar [2]. Several medicinal properties have been attributed to the Tulsi plant not only in Ayurveda and Siddha but also in Greek, Roman and Unani systems of medicine [3]. It grows in tropical and sub-tropical belts including India [4] and is commonly seen in the Indian fields. "Tulsi" in Sanskrit means "the incomparable one"[5] and hence is considered the queen of herbs. It is found growing naturally in moist soil nearly all over the globe [6]. This plant has been evaluated pharmacologically for antimicrobial, immune modulatory, anti-inflammatory, hypoglycemic, chemoprotective and analgesic activities [7]. *Ocimum* genus contains between 50 to 150 species of herbs and shrubs from the tropical regions of Asia [8]. Plants have square stems, fragrant opposite leaves and whorled flower on spiked inflorescence [9]. The essential oil of basil extracted via steam distribution from the leaves and flavouring tops are used to flavour foods, dental and oral products, in fragrances and in traditional rituals and medicines [10, 11]. Extracted essential oils have also been shown to contain biologically active constituents that are insecticidal

[12], nematocidal [13] and fungistatic [14]. An essential oil, prepared from its leaves, contains eugenol, eugenal, carvacrol, methylchavicol, limatrol and caryophyllene. The leaves also contain ursolic acid and n-triacontanol. The oil prepared from its seeds is composed of fatty acids and sitosterol. The roots contain sitosterol and three triterpenes A, B, and C. Eugenol, its methyl ether, nerol, caryophyllene, terpinen 4-decylaldehyde, selinene, pinenes, camphene and  $\alpha$ -pinene have been identified in essential oil, it also contains rosmarinic acid, thymol, linalool and methyl chavicol and citral etc.[15]. *Ocimum sanctum* leaf extract in normal tap water and local river water. The essential oil present in most of the *Ocimum* species is responsible for its antifungal, antibacterial and antiviral properties.[16] The ethanolic extract of *Ocimum sanctum* was found to be effective against streptococcus mutans in an invitro study. Its leaves have been found to have a strong anti-fungal activity against the *Aspergillus* species.[17].

## A. Botany

There are mainly two types of Sacred Tulsi met within the cultivation, the Green type and the Purple type. The green type also called Sri Tulsi or Rama Tulsi is the most common one whereas the second type bearing purple leaves is not that common and is called as Krishna Tulsi or Shyam Tulsi. However the species irrespective of its colour in Sanskrit is called 'Tulsi' or 'Parnasa'. The plant is erect, herbaceous softly hairy, much branched, annual or biennial, which is found throughout India upto a altitude of 1800 m. in the Himalayas, cultivated and grown in gardens and temples. Both green and purple types of *Ocimum sanctum* are not morphologically much different from each other. However, some of the vegetative characters such as plant height, petiole length, leaf size, internode length etc. are comparatively smaller in the purple type (Khosla, 1980). The plant is propagated by seeds and is easy to grow without care and further propagation of the forests, thus increases organic productivity of the soil.

## II. PHYTOCHEMICALS PRESENT IN OCIMUM SANCTUM

A. Fixed oil 5 -Linoleic acid, Linolenic acid, Oleic acid, Palmitric acid, Stearic acid(Phytochemical) Seeds (Plant Parts).

- B. Essential oil 6,7,27-Aromadendrene oxide, Benzaldehyde, Borneol, Bornyl acetate, Camphor, Caryophyllene oxide, cis- $\alpha$ -Terpineol, Cubenol, Cardinene, D-Limonene, Eicosane, Eucalyptol, Eugenol, Farnesene, Farnesol, Furaldehyde, Germacrene, Heptanol, Humulene, Limonene, n-butylbenzoate, Ocimene, Oleic acid, Sabinene, Selinene, Phytol, Veridifloro,  $\alpha$ -Camphene,  $\alpha$ -Myrcene,  $\alpha$ -Pinene,  $\beta$ -Pinene,  $\alpha$ -Thujene,  $\beta$ -Guaiene,  $\beta$ Gurjunene, methyl chavicol and linalool. (Phytochemical) Leaves(Plant Parts).
- C. Mineral Contents8 -Vitamin C, Vitamin A, Calcium, Phosphours, Chromium, Copper, Zink, Iron. (Phytochemical) .Whole Plant(Plant Parts).
- D. Alcoholic Extract 2 -Aesculectin, Aesculin, Apgenin, Caffiec acid, Chlorgenic Acid, Circineol, Gallic Acid, Galuteolin, Isorientin, Isovitexin, Luteolin, Molludistin, Orientin, Procatechuic acid, Stigmsterol, Urosolic acid, Vallinin, Vicensi, Vitexin, Vllinin acid. (Phytochemical) Leaves/ Areal Parts (Plant Parts).

### III. MEDICINAL USES OF OCIMUM SANCTUM

- A. Analgesic Activity: Singh et al., in 1995 studied the analgesic activity of fixed oil from the seeds of *Ocimum sanctum* (OS) in mice and rats using the tail flick, tail clip, tail immersion and acetic acid-induced writhing methods. It was found it be effective against acetic acid induced writhing in dose dependent manner, suggesting that writhing inhibiting activity of the oil is peripherally mediated due to combined inhibitory effects of prostaglandins, histamine and acetylcholine[18].
- B. Antiulcer Activity: The aqueous extract of *Ocimum sanctum* (100mg /kg an 200 mg/kg orally) exhibited significant protection against ethanol induced gastric ulceration in Wistar rats. OS exhibits antiulcer activity by enhancing antioxidant potential of gastric mucosa there by reducing mucosal damage[19] The fixed oil of OS administered i.p. shows significant antiulcer activity against aspirin, indomethacin, alcohol (ethanol 50%), histamine, reserpine, serotonin or stress-induced ulcers in rats. The fixed oil significantly possessed antiulcer activity due to its lipoxigenase inhibitory, histamine antagonistic and antisecretory effects.[20]
- C. Antiarthritic Activity: The fixed oil of *Ocimum sanctum* seeds was screened for antiarthritic activity by Singh et al. in 1996 using Freund's adjuvant arthritis, formaldehyde-induced arthritis and turpentine oilinduced joint edema in rats. The fixed oil showed significant anti-arthritic activity in both models and anti-edema activity against turpentine oil-induced joint edema[21].
- D. Healing Power: The tulsi plant has many medicinal properties. The leaves are a nerve tonic and also sharpen memory. They promote the removal of the catarrhal matter and phlegm from the bronchial tube. The leaves strengthen the stomach and induce copious perspiration. The seed of the plant are mucilaginous.
- E. Fever & Common Cold: The juice of tulsi leaves can be used to bring down fever. Extract of tulsi leaves in fresh water should be given every 2 to 3 hours. In between one can keep giving sips of cold water. In children, it is every effective in bringing down the temperature.
- F. Coughs: Tulsi is an important constituent of many Ayurvedic cough syrups and expectorants. It helps to mobilize mucus in bronchitis and asthma. Chewing tulsi leaves relieves cold and flu.
- G. Respiratory Disorder: The herb is useful in the treatment of respiratory system disorder. A decoction of the leaves, with honey and ginger is an effective remedy for bronchitis, asthma, influenza, cough and cold. A decoction of the leaves, cloves and common salt also gives immediate relief in case of influenza. They should be boiled in half a liter of water till only half the water is left and add then taken.
- H. *Ocimum sanctum* has been shown to inhibit acute as well as chronic inflammation. The essential oil and seed extract act by the inhibition of cyclo-oxygenase and lipoxigenase.[22].
- I. *Ocimum sanctum* maybe considered as a drug of natural origin which possesses both anti-inflammatory and antiulcer activity. It exhibits gastric secretion inhibition activity in pylorus ligated rats due to its lipooxygenase inhibitory, antihistaminic and antisecretory action.[23]
- J. The use of *Ocimum sanctum* in the therapeutic management of diabetes mellitus is gaining a lot of importance. The rich fibre content of plant particularly the soluble fibres have shown beneficial effects in treating hyperglycemia and hyperlipidemia. The mechanism of action for its anti diabetic effect is that the extract of plant is able to stimulate adenylate cyclase or phosphatidylinositol, or having direct effect on pancreatic beta cells by promoting calcium entry and thereby causing release of stored insulin.[24]
- K. Anti-helminthic Activity: The essential oil of *Ocimum sanctum* and eugenol, tested in vitro, showed potent anthelmintic activity in the *Caenorhabditis elegans* model.[25]
- L. Hepatoprotective Activity: Lahon et al. in 2011 studied hepatoprotective activity of *Ocimum sanctum* alcoholic leaf extract against paracetamol-induced liver damage in Albino rats synergism with silymarin and concluded that *Ocimum sanctum* alcoholic leaf extract showed significant hepatoprotective activity and synergism with silymarin[26]

M. Immunomodulatory Activity: Jeba et al. in 2011 studied that aqueous extract of *Ocimum sanctum* at the oral doses of 100, 200 mg/kg/day in rats enhances the production of RBC, WBC, haemoglobin and also enhanced the production of antibodies without affecting the biochemical parameters.[27].

#### CONCLUSION

Plants have been used for the treatment of diseases throughout the world since the beginning of civilization. Tulsi is cultivated for religious and medicinal purposes. A scientific research offers substantial evidence that tulsi protects against and reduces stress; enhances stamina and endurance; increases the body's efficient use of oxygen; boosts the immune system; reduces inflammation; protects against radiation damage; lessens aging factors; supports the heart, lungs and liver; has antibiotic, antiviral and antifungal properties; enhances the efficacy of many other therapeutic treatments; and provides a rich supply of antioxidants and other nutrients. Overall, tulsi is a premier adaptogen, helping the body and mind to adapt and cope with a wide range of physical, emotional, chemical and infectious stresses, and restore disturbed physiological and psychological functions to a normal healthy state. Tulsi Leaf extract have great potential as antimicrobial agent for the treatment of water. The treatment is simple, cost-effective, ecofriendly, reachable for all and the components present in *Ocimum sanctum* leaves have no side effects to human compared to chemical treatment. More over the water treated with Tulsi extract serve not only as germ free but also as Medicinal water. It has an esteemed status in herbs with diverse biological potentials and has a great scope for further new area of investigations. Traditionally crude extracts of various parts of plants have been used for their antidiabetic, antioxidant, antistress, antihyperlipidemic and antibacterial properties. Future research on sacred basil should be emphasized for control of various diseases especially it should be explore as a significant remedy regarding neuropsychological disorders for the welfare & service of mankind.

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