Chemical constituents and pharmacological action of *Ocimum sanctum* (Indian holy basil-Tulsi)

Sunita Verma*

**ABSTRACT**

The plant of *Ocimum sanctum* commonly known as “Tulsi”, belong to Lamiaceae family. It is an erect, much branched, fragrant and erected plant attaining a height of about 20-50 cm. Different parts of the plant are used in Ayurveda and Siddha systems of medicine for prevention and cure of many illnesses like cough, influenza, common cold, headache, fever, colic pain, bronchitis, asthma, hepatic diseases, fatigue, skin diseases, arthritis, digestive disorders. The present paper is an attempt to provide a detailed botanical description, taxonomy, traditionally used and various pharmacological activity study of the plant.

**Keywords:** Cough, Fever, Fatigue, Phytochemical, Medicinal.

**INTRODUCTION**

Ayurveda is a system of traditional Hindu medicine which is native to India and is renowned as one of the major systems of alternative and complementary medicine. According to Hindu mythology, Dhanvantari, the physician of the God’s, is attributed with the origin of ayurvedic medicine. Ayurveda traces its origin to the Vedas particularly Atharvaveda and it stresses the use of indigenous plant based medicines for the treatment of diseases [1].

*Tulsi* “Queen of herbs” is described as sacred and medicinal plant in ancient literature. It is an important symbol of the Hindu religious tradition. The name *Tulsi* is derived from ‘Sanskrit’, which means “matchless one” [2]. Its other name, Vishnupriya means the one that pleases Lord Vishnu. This plant belongs to the family *Labiatae*, characterized by square stem and specific aroma. Botanical name of *Tulsi* is *Ocimum sanctum* (Linn). In India, the plant is grown throughout the country from Andaman and Nicobar islands to the Himalayas up to 1800 meters above the sea level [3]. It is also abundantly found in Malaysia, Australia, West Africa and some of the Arab countries. *Ocimum sanctum* (Linn) is the most prominent species of the genera. The leaves of the plant are considered to be very holy and often form a consistent part of the Hindu spiritual rituals (*Tirtha or Prasada*). *Ocimum sanctum* has two varieties i.e. black (*Krishna Tulsi*) and green (*Rama Tulsi*), their chemical constituents are similar. Both the varieties also have common medicinal properties [4].

**TAXONOMY**

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**PHARMACOLOGICAL ACTIVITY**

Anticancer activity

In ayurveda, various plants are used as a potential source of anticancer and antitumor properties. It has been found that ethanolic extract of *Ocimum sanctum* mediated a significant reduction in tumor cell size and an increase in lifespan of mice having Sarcoma-180 solid tumors [10]. Similar results were also obtained by others where leaf extract administered orally (200 mg/kg, p.o.) resulted in significant reduction in tumor volume, increase in average body weight, and survival rate of mice [11]. Ocimum has the ability to protect the DNA of the body from dangerous radiations [12].

**Antidiabetic activity**

*O. sanctum* has been reported to possess very good anti diabetic properties. The anti-diabetic activity of hydroalcoholic extract of *O. tenuiflorum* against streptozotocin and nicotinamide induced diabetes in rats was found to be significant at the dose levels of 250 and 500 mg/kg body weight and this effect was comparable with glibenclamide [13]. Hyperglycaemia was shown to be reduced in alloxan diabetic rats when administered ethanol extract of *O. sanctum* in both acute and long-term feeding studies [14]. In another study by J M A Hannan et al. prominent insulin-secretory effects were noted in the rat pancreas perfused with the ethanol extract and three partition (ethylacetate, butanol and aqueous) fractions of *O. sanctum*. Similar effects were found in acute insulin-release studies using isolated rat islets [15].

**Antilipidemic activity**

Hyperlipidaemia, atherosclerosis and related diseases are becoming a major health problem now days. Aqueous extract of *O. basilicum* reduces the level of total cholesterol, triglycerides and LDL cholesterol levels in acute hyperlipidaemia induced by triton WR-1339 in rats [16]. In a study conducted on rabbits a diet supplemented with 1-2 % fresh leaves of Tulsi for 28 days lowered the total lipid [17].

**Antibacterial activity**

Antibacterial activity of the aqueous, alcoholic, chloroform extract and oil obtained from leaves of *Ocimum sanctum* were studied against *E.coli*, *P. aeruginosa*, *S. typhimurium* and *S. aureus*. Extract obtained from *O. sanctum* were observed equally effective against pathogenic gram-positive and gram-negative bacteria [18]. Fresh leaves essential oil had shown more antibacterial properties compared to dried leaves essential oil of *Tulsi* and in case of fungus the property is just the reverse [19].

**Eye Disease**

The leaf juice of *Ocimum sanctum* along with triphala is used in ayurvedic eye drop preparations recommended for glaucoma, chronic conjunctivitis and other painful eye disease. In daily routine one may use about three drops of tulsi oil along with honey and it is supposed to improve eye sight [20].

**Anti fertility activity**

The benzene and petroleum ether extracts of leaves of Tulsi have been reported to produce 80% and 60% antifertility activity respectively in female rats [21]. In Kerala the local women as well as the Ayurvedic physicians have been reported to use the leaves of Tulsi for antifertility effect [22]. One of the major constituents of the Tulsi leaves is ursolic acid and it has been reported that it possess anti-fertility effect. This effect has been attributed to its anti-estrogenic activity which may be responsible for arrest of spermatogenesis in males and due to inhibitory effect on implantation of ovum in females. This constituent may prove to be a promising anti-fertility agent devoid of side effects. In males, Tulsi leaves reduce spermatogenesis by retarding sertoli cells activity [23].
Mosquitocidal activity

Mosquitocidal activity of Tulsi was investigated using its eugenol and triglyceride (isolated from Tulsi’s hexane extract) on fourth instars Aedes aegypti larvae [24]. When seeds of Tulsi was placed in water, it exude within one hour, a mucilaginous substance (polysaccharides) and larvae which came in contact with seeds became firmly attached to it and died due to drowning of larvae [25].

CONCLUSION

It is observed from various studies that the Ocimum sanctum have a number of pharmaceutical and medicinal property and according to this it is effective in the treatment of a number of diseases. Future research on sacred basil should be emphasized for control of various diseases.

REFERENCES


HOW TO CITE THIS ARTICLE