

***Tulsi (Ocimum Sanctum Linn.): AN AYURVEDIC AND CONTEMPORARY REVIEW***Preeti¹, A Ramamurthy², Krutika Chaudhary³^{1,2,3}National Institute of Ayurveda, Jorawar Singh Gate, Amer Road, Jaipur, Rajasthan 302002Corresponding Author: Preetinandal5401@gmail.com<https://doi.org/10.46607/iamj3409122021>

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**ABSTRACT**

Tulsi (Ocimum sanctum Linn. Family - Lamiaceae) has been revered in India for over five thousand years, as a healing balm for body, mind and spirit, and is known to bestow an amazing number of health benefits. It is a medicinal herb used in the indigenous system of medicine. *Tulsi* has been adored in almost all ancient ayurvedic texts for its extraordinary medicinal properties. It is pungent –bitter(*tikta*) in taste and hot (*Ushna*), light(*laghu*) and dry(*ruksha*) in effect. Its seeds are considered to be cold in effect. The roots, leaves and seeds of *Tulsi* possess several medicinal properties. Ayurvedic texts categorise *Tulsi* as a stimulant, aromatic and antipyretic. In the present review, the reported scientific activity of *Tulsi* is compiled and collected from different compendia and available literature presented systematically. In the present review, the references related to *Tulsi* are collected and compiled from different Ayurvedic texts, Modern research articles and other relevant compendia. This review is presented in a systematic manner which will help the researchers as well as clinicians dealing with *Tulsi* to know its proper usage as this herb is seemed to be highly valuable, possessing many pharmacological/medicinal properties according to Ayurveda as well as modern aspects.

Keywords: *Ayurveda, Drug Research, Holy basil, Immunity, Tulsi***INTRODUCTION**

Tulsi is one of the aromatic plants, distributed mainly in the tropical and subtropical regions of the world

including India. *Tulsi* - The Queen of Herbs is the most sacred herb which is cultivated and worshipped

in every house of India. It is an erect, much-branched, fragrant and sericeous plant attaining a height of about 30-60 cm when mature. Its aromatic leaves are simple, opposite, elliptic, oblong, obtuse or acute with entire or substrate or dentate margins, growing up to 5 cm long. The *Tulsi* flowers are small, purplish in elongate racemes in close whorls. The fruits are small, and the seeds are reddish yellow with mucilaginous texture in consumption. The plant is distributed, cultivated and worshipped in temples and houses of Hindus. This is commonly known as *Vishnu-Priya*, which means the one that pleases *Lord Vishnu*.

The genus *Ocimum* comprises more than 150 species and is considered as one of the largest genera of the *Lamiaceae* family (Evans, 1996). *Tulsi* is described as sacred (Anonymous, 1991) and medicinal plant in ancient literature (Kirtikar and Basu, 1975). The name *Tulsi* is derived from 'Sanskrit', which means "Matchless One" (Ghosh, 1995). Among the plants known for medicinal value, the plants of genus *Ocimum* are very important for their therapeutic potentials. *Ocimum sanctum* Linn. (*Tulsi*), *Ocimum gratissium* Linn. (*Ram Tulsi*), *Ocimum canum* Linn. (*DulalTulsi*), *Ocimum basilicum* Linn. (*Ban Tulsi*), *Ocimum kilimandscharicum* Linn. *Ocimum ammericanum* Linn. *Ocimum camphora* Linn. and *Ocimum micranthum* Linn. are examples of known important species of genus *Ocimum* which grow in different parts of the world and are known to have medicinal properties (Atal,1989, Sen1993, Nagarajun,1989). *Tulsi* is commonly cultivated in gardens. Two types of *Ocimum sanctum* L. are frequently found in cultivation: (i) *Tulsi* plants with green leaves known as *Sri Tulsi* & (ii) *Tulsi* plants with purple leaves known as *Krishna Tulsi* (Bauer, 1997)

1.1. Properties and Action

Rasa: Katu, Tikta, Kashaya

Guna: Laghu, Ruksha, Tikshna

Virya: Ushna

Vipaka: Katu

Karma: Dahakarta, Vranashodhaka, Hardya, Kar-mighna, Kaphahara, Pittahara

1.2. Phytoconstituents

Some of the main chemical constituents of *tulsi* are oleanolic acid, ursolic acid, rosmarinic acid, eugenol, carvacrol, linalool, β -caryophyllene (about 8%), β -elemene (c.11.0%), and germacrene D (about 2%). However, the best known of many active components that have been identified and extracted are eugenol (an essential oil) and ursolic acid (Miller 2013)

Fresh leaves and stem of *Ocimum sanctum* extract yielded some phenolic compounds (antioxidants) such as cirsilineol, circimaritin, isothymusin, apigenin and rosameric acid, and appreciable quantities of eugenol. (Yanpallewar,2004)

Two flavonoids: viz., orientin and vicenin from aqueous leaf extract of OS have been isolated (Gupta,2002). Ursolic acid, apigenin, luteolin, apigenin-7-O-glucuronide, luteolin-7-O glucuronide, orientin and molludistin have also been isolated from the leaf extract (Nair,1982). OS also contains a number of sesquiterpenes and monoterpenes viz., bornyl acetate, β -element, neral, α -and β -pinenes, camphene, campesterol, cholesterol, stigmasterol and β -sitosterol (IDMA. 2002).

1.3. Toxicity Study

The median lethal dose (LD₅₀) of OS fixed oil was determined after intraperitoneal administration in mice. The fixed oil was well tolerated up to 30 ml/kg, while 100% mortality was recorded with a dose of 55 ml/kg. The LD₅₀ of oil was 42.5 ml/kg. There was found no untoward effect on subacute toxicity study of OS fixed oil at a dose of 3 ml/ kg/day, IP for 14 days in rats (Singh,2007).

2. Material and methods

2.1. Pharmacological Action

Tulsi is ranked among the few wonders plant for having enormous medicinal potentialities which act as a panacea for a number of ailments and diseases. Each and every part of the plant is useful in various dosages for ample ailments. Ample of pharmacological investigations have been carried out in *O. sanctum* during the recent past and the studies suggest that the plant possesses vital biological activity against a number of ailments and diseases.

On the basis of various experimental and clinical research, the following pharmacological activities or medicinal properties of OS have been reported.

2.2.1. Antistress activity: The plant *Ocimum sanctum* has been found to possess adaptogenic properties when tested against a battery of experiments in mice and rats (Bhargava1981, Dadkar 1988, Sen1992, Tabassum,2010). Basil leaves to increase the capacity to cope, against stress (adaptogenic). Even a healthy person can chew 12 leaves of basil, twice a day to prevent stress. (Cohen 2014)

2.2.2. Antibiotic property: *Ocimum sanctum* also possesses antifungal activity against *Aspergillus niger* and aqueous extract of it was found to be effective in patients suffering from viral encephalitis (Rajeshwari 1992). *Tulsi* leaves paste is indeed found to be very effective. *Tulsi* has significant natural antibacterial, antiviral and antifungal activities and is helpful in treating many serious systemic diseases, as well as localized infections. *Ocimum sanctum* fixed oil showed good antibacterial activity against *Bacillus pumilus*, *Pseudomonas aeruginosa* and *S. aureus*. Higher content of linolenic acid in OS fixed oil could contribute towards its antibacterial activity (Singh 2005).

2.2.3. Antipyretic activity: The antipyretic activity of *Ocimum sanctum* fixed oil was evaluated by testing it against typhoid-paratyphoid A/B vaccine-induced pyrexia in rats. The oil on IP administration considerably reduced the febrile response indicating its antipyretic activity. At a dose of 3 ml/kg, the antipyretic activity of the oil was comparable to aspirin. Further, the fixed oil possessed prostaglandin inhibitory activity and the same could explain its antipyretic activity (Singh,2005).

2.2.4. Hepatoprotective activity: Oral administration of hydroethanolic extract of *Ocimum sanctum* leaves @ 200 mg/kg in male Wistar albino rats gave protection against liver injury induced by paracetamol (Chattopadhyay,1992).

2.2.5. Antidiabetic activity: The ethanolic extract of *Tulsi* leaves leads to marked lowering of blood sugar in normal glucose fed hyperglycaemic & streptozocin induced diabetic rats (Skaltsa, 1987).

2.2.6. Antioxidant activity: Antioxidant activity of the flavonoids (orientin and vicenin) in vivo was expressed in a significant reduction in the radiation-induced lipid peroxidation in mouse liver (Uma Devi,2000). The aqueous extract also decreased LPO formation (thiobarbituric acid reactive substances TBARS) and increased antioxidant enzymes like superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPX), glutathione transferases (GT). It also increased antioxidant like reduced glutathione (GSH) levels in plasma and liver, lung, kidney and brain of rats (Hussain,2001).

2.2.7. Antimalarial activity: Ayurvedic preparation containing *Ocimum sanctum*, *Piper nigrum* Linn. and *Curcuma longa* Linn. has been shown to possess antimalarial activity against *Plasmodium vivax* and highly effective against *Plasmodium falciparum* (Rajeshwari,1992). A decoction prepared from the roots of the *Tulsi* plant is used as a diaphoretic in malarial fever (Pandey,1990). *Tulsi* is an important constituent of many Ayurvedic cough syrups and expectorants.

2.2.8. Antiulcer activity: The fixed oil of *Ocimum sanctum* administered intraperitoneally elicited significant antiulcer activity against aspirin, indomethacin, alcohol (ethanol 50%), histamine, reserpine, serotonin or stress-induced ulcers in rats (Singh, 2007).

2.2.9. Anti-inflammatory activity: Methanolic extract (500 mg/kg) and an aqueous suspension of *Ocimum sanctum* showed analgesic, antipyretic and anti-inflammatory effects in acute (carrageenan-induced pedal oedema) and chronic (croton oil-induced granuloma and exudate formation) inflammations in rats (Godhwani, 1987), (Kalabharathi 2011)

2.2.10. Analgesic activity: The *Ocimum sanctum* oil was found to be devoid of analgesic activity in experimental pain models (tail-flick, tail clip and tail immersion methods). However, it was effective against the acetic acid-induced writhing method in mice in a dose-dependent manner. The writhing inhibiting activity of the oil is suggested to be peripherally mediated due to the combined inhibitory effects of prostaglandins, histamine and acetylcholine (Singh, 1995).

RESULTS AND DISCUSSION

The inclusion of *Tulsi* in Indian culture and the religious practice itself is suggestive of its importance. In Ayurveda classics, the drug is reported with *vataphahara* and *Pittakaraka* property. It is reported having *Shwasahara*, *Krimighna*, *Vishaghna*, *Kasaghna*, *Jwarghna*, *Putigandhanashan*, *Vranashodhan*, *Deepana*, *Rochanakarma* and indicated in *Shwasa*, *Krimi*, *Kasa*, *Vrana*, *Jawara*, *Kandu*, *Swarya* by

samhita and lexicons of Ayurveda. (Table 1). It is also observed having antipyretic, antidiabetic, antioxidant, antibiotic, anti-inflammatory, hepatoprotective activity and anti-stress activity in various experimental models. The drug is reported for indications like indigestion, cough, urticaria, malarial fever, greying of hairs, wound and earache (Table 2). Hence, we can use this drug in clinical practice to cure various ailments.

Table 1. Karma of *Tulsi* reported in *Brihadtrayee*

Sl. No.	Karma	Charaka	Sushruta	AstangaHaridya	AstangaSanghara
1.	<i>Shwasahara</i>	✓	✓	✓	✓
2.	<i>Krimighna</i>	✓	✓	✓	✓
3.	<i>Vishaghna</i>	✓	✓	✓	✓
4.	<i>Kasaghna</i>	✓	✓	✓	✓
5.	<i>Kandughna</i>	✓	-	✓	✓
6.	<i>Jwarghna</i>	✓	✓	✓	✓
7.	<i>Putigandhanashan</i>	✓	✓	✓	✓
8.	<i>Kaphvaatghna</i>	✓	✓	-	✓
9.	<i>Kaphaghna</i>	-	✓	-	✓
10.	<i>Pittakaraka</i>	✓	✓	-	-
11.	<i>Kusthaghna</i>	✓	✓	✓	-
12.	<i>Vranashodhan</i>	-	✓	✓	✓
13.	<i>Swarya</i>	✓	-	-	✓
14.	<i>Shirovirechan</i>	✓	✓	✓	✓
15.	<i>Shoolaghna</i>	-	✓	-	-
16.	<i>Deepana</i>	-	-	✓	-
17.	<i>Rochana</i>	-	-	✓	-
18.	<i>Vidahi</i>	-	-	✓	✓
19.	<i>Haridya</i>	-	-	✓	-
20.	<i>Sheetaghna</i>	-	-	-	✓

Table 2. Uses and Indications of *Tulsi*

Sl. No.	Indication/Diseases	Part of Tulsi used for preparation	Plants used in the preparation	Reported activities in experimental models
1.	Indigestion	Leaves	<i>Tulsi (Ocimum Sanctum Linn.) & Sunthi (Zingiberofficinale Roxb.)</i>	Hepatoprotective activity (Chattopadhyay, 1992).
2.	Cough	Leaves	<i>Tulsi juice (Ocimum Sanctum Linn.)</i>	Antibiotic property (Rajeshwari 1992).
3.	Makkalla	Leaves	<i>Tulsi juice (Ocimum Sanctum Linn.) & Old Jaggery</i>	Analgesic activity, (Singh 1992) Anti-inflammatory activity (Godhwani, 1987).
4.	Urticaria	Leaves	<i>Tulsi (Ocimum Sanctum Linn.) juice L/A</i>	Anti-inflammatory activity (Godhwani, 1987).
5.	Malarial fever	Root	<i>Tulsi (Ocimum Sanctum Linn.) &</i>	Antimalarial activity

			<i>Dronapuspi</i> juice (<i>Leucas cephalotes</i> Spreng.)	(Pandey,1990).
6.	Graying of Hair	Leaves	<i>Tulsi</i> juice (<i>Ocimum Sanctum</i> Linn.) & Coconut Oil (<i>Cocos nucifera</i> Linn.)	Antioxidant activity (Hussain,2001).
7.	Wound	Leaves	<i>Tulsi</i> juice (<i>Ocimum Sanctum</i> Linn.) & <i>Haridra</i> powder (<i>Curcuma longa</i> Linn.)	Antiulcer activity, (Singh, 2007). Analgesic activity, (Singh1992) Anti-inflammatory activity (Godhwani,1987).
8.	Earache	Leaves	<i>Tulsi</i> juice (<i>Ocimum Sanctum</i> Linn.)	Analgesic activity, (Singh1992) Anti-inflammatory activity (Godhwani,1987).

CONCLUSION

Tulsi is a common herb grown in many households with a wide range of therapeutic properties. *Tulsi* is considered being an adaptogen, balancing different processes in the body, and helpful for adjusting to physical and mental stress. The drug may be explored for its immunological actions, rejuvenating, antidiabetic, actions according to Ayurveda. It is easily available non-controversial, multipurpose Ayurvedic medicine.

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