



## Phytoconstituents, conventional and chemical uses of Tulsi: a review

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**Abstract:** The use of the plants as medicine is slowly and gradually increasing across the world as they have minor or no side effect. Tulsi (*Ocimum sanctum* Linn.) “Queen of herbs” is an important epitome of God in Hindu religious traditions. Tulsi has immensely complex makeup and been used by Hindus but now after recognizing its immense curative benefits, it has been used by ample number of people. Tulsi is used in different formulas of therapy like Ayurved and Siddha for safeguard and curative of skin diseases, colic pain, digestive disorders, night blindness, sleeping disorders, inflammation in the joints and pain caused by it, diarrhea, etc. This review of paper presents the phytochemistry, traditional as well as medicinal properties of Tulsi. Also, it illustrates the benefits of daily addition of Tulsi to the diet.

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**Keywords:** antidote, cure, medicinal plant, *Ocimum sanctum* Linn.

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### INTRODUCTION

Plants have been used for human benefits from the ancient period (Sumner, 2016). Almost 4/5<sup>th</sup> proportion of the people in the world is using therapeutic plant as health care, which amounts more within emergent nations (Heinrich, 2009; EL-Kamali & EL-Amir, 2010). The use of the plants as medicine is slowly and gradually increasing across the world as they have minor or no side effect (Jordan et al., 2010). In Nepal, more than 2300 plant species are used as traditional medicine (Rokaya et al., 2013). Tulsi (*Ocimum sanctum* Linn.) “Queen of herbs” is considered an epitome of god in Hindu religious traditions which belongs to genus *Ocimum* and family Lamiaceae and has significant remedial and curative properties (Gupta et al., 2002). *Ocimum sanctum* has two assortments for example Black (Krishna Tulsi) and Green (Ram Tulsi). They have common chemical constitutions and have comparable therapeutic characteristics (Das and Vasudevan, 2006). Tulsi is customarily dubbed as Vishnu-Priyaa, Tulasi in Sanskrit language, and Kaala Tulasi in Indian tone and Holy Basil in British English (Pandey and Madhuri, 2010). It is believed to have holy and therapeutic importance in antiquated writing (Verma, 2016). 'Tulsi' word is taken from "Sanskrit", which infers "unique one" or

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"incomparable one" (Jain et al., 2015). Tulsi are cultured in various corners of the globe and are renowned in a broad spectrum for their herbal and therapeutic benefits (Buddhadev et al., 2014). Tulsi plant has not only shown various medicinal and therapeutic hallmark in Ayurveda, Siddha but also in Greek, Roman and Unani frameworks of medication (Jeba et al., 2011). *Ocimum sanctum* is worthwhile in the therapy of acute coryza, malarial fever, dengue fever, cough, inflammation in the bronchi, bronchial asthma, throat pain, flu, cardiovascular disorders, optical diseases, oral infections, insect stings, tensity, and renal stone etc. (Joseph &Nair, 2013).

### **MATERIAL AND METHODS**

Secondary data were used to gather the information. Online portals like Google scholar and research gate were used to extract the published articles (Gahatraj et al., 2020; Kandel et al., 2020; Timilsina et al., 2020; Gautam et al., 2020).Gathered information were subjectively dissected and introduced well. This paper has managed to explore Structure, Chemical Composition, Conventional and Medicinal or Chemical uses of Tulsi.



**Fig.1** *Ocimum sanctum*



*Structure of Tulsi:* *Ocimum sanctum* is rigid, much furcated shrub with the height of 30-60cm on maturity. It has 5cm long simple, opposite, aromatic, elliptical, obtuse, dentate margin leaves (Kulkarni & Adavirao, 2018). Flowers are elongated raceme and purplish in round whorl (Pattanayak et al., 2010) The shade of the seeds are radish yellow and berry are little in size (Kumar et al., 2012).

*Chemical Composition:* Through the literature review, we came to know that the chemical makeup of *Ocimum sanctum* is immensely webbed. It contains numerous nutriments and other natural dynamic mixes (Dash et al., 2013). The various phytochemical compounds present in *Ocimum sanctum* are listed in Table 1.

Table: 1. Phytochemical compounds present in major parts of *Ocimum sanctum*

Plant Parts	Extract	Chemical Composition
Leaves	Essential Oil	Aromadendreneoxide, Borneol, Camphor, n-butylbenzoate, Nonane, Ocimene, Oleic acid, Caryophyllene oxide, Benzaldehyde, Bornyl acetate, cis $\alpha$ Terpineol, Germacrene, Heptanol, Humulene, Limonene, nbutylbenzoate, Iedol, Ocimene, Oleic acid, Cubenol, Cardinene, Octane, Phytol, $\alpha$ Pinene, $\beta$ Pinene, Sabinene, Selinene, $\alpha$ Thujene, $\beta$ Guaiene, $\beta$ Gurjunene, D-Limonene, Eicosane, Eucalyptol, Eugenol, Farnesene, Farnesol, Furaldehyde, $\alpha$ Camphene, Cirsilineol, Circimaritinphytol, Germacrene, Isothymusin, linalool, Methyl-Chavicol, Methyl-Eugenol, $\alpha$ -Myrcene, Apigenin, Cadinene, Benzene, and Viridifloro, Rosmarinic acid (Pattanayak et al., 2010; Singh et al., 2012; Kadian & Parle, 2012; Yanpallewar, 2004; Vani et al., 2009; Dodhare et al., 2012; Khan, 2010).
Seed	Fixed Oil	Linoleic acid, Linolenic acid, Oleic acid, Palmitic acid, Stearic acid, Sitosterol, Dilinolenolins, Linodilinolins, Hexoureic acid (Pattanayak et al., 2010; Kadian & Parle, 2012; Singh et al., 2007; Mondal et al., 2009).
Aerial part/leaves	Alcoholic Content	Aesculectin, Stigmasterol, Apigenin, Apigenin-oglucuronide, Circineol, Gallic acid, Galuteolin, Isorientin, Isovitexin, Luteolin, Orientin, Procatechuic acid, Aesculin, Triacantanol ferulate, Urosolic acid, Vanillin Vitexin, Vanillin acid, Vicenin-2, Circineol, Molludistin, Chlorogenic Acid, Caffeic acid (Pattanayak et al., 2010; Kadian & Parle, 2012; Singh et al., 2012; Mondal et al., 2009).
Whole Plant	Vitamins and Mineral Content	Vitamin C, Vitamin A, Calcium, Phosphorus, Chromium, Copper, Zink, Iron, Vitamin E, Carotene, Nickel (Pattanayak et al., 2010; Kadian & Parle, 2012; Anbarasu & Vijayalakshmi, 2007)

*Conventional uses of Tulsi:* Tulsi is likewise called "the essence of life" since it advances perpetuity in living beings (Tiwari, 2014). Tulsi is believed to have diverse traditional value. Earlier it has been used by Hindus but now after recognizing its immense therapeutic benefits, others are also using it (Kumar et al., 2010). Hindus considers it as an epitome of the goddess Tulsi/Vrinda which is considered as goddess Laxmi (Chatterjee, 2001). If Tulsi plant is absent in the lapa of Hindus house it is considered imperfect. Tulsi is believed to promote perpetuity and long living delights (Deshmukh et al., 2015). Extract of the Tulsi leaves is used as demulcent, catalyst and expectorant (Mondal, 2009). Tulsi leaves are additionally utilized while venerating Vishnu and some different divinities as well. Tulsi stems or roots are used to make Prayer beads, which is an important symbol of initiation by Vaishnavas (Simoons, 1998).

Conventionally, Tulsi is utilized in different pattern; juicy essence from the fresh or dried leaves are used to get ready natural teas or blended in with different herbs to intensify the restorative standards (Pattanayak et al., 2010). In Ayurveda and Siddha frameworks Tulsi has been utilized as a precautionary measure just as cure for acute coryza, pain in the head, cough, flu, pain in the ears, fever, colic pain, throat pain, bronchial asthma, hepatic diseases, also remedy for snake chomp and scorpion nibble, migraine, fatigue strength, flatulence, dermal diseases, cut, arthritis, digestive problems, insomnia, optical diseases, diarrhea (Joshi, 2017). It is also used to prepare drugs such as



expectorant, analgesic, anticancer, hepatoprotective, hypotensive, hypolipidemic and anti-stress agent (Nagarajan, 1982).

Likewise, dry powder of Tulsi leaves are also boiled in water for about 5 minutes,  $\frac{1}{4}$  of the leaves is mixed with ginger powder and black pepper in equal quantity and filtered; the filtrate that we obtain can be consumed with sugar in the morning and evening to relieve cold effects, headache, sneezing, pain on the swellings, indigestion, early stages of malaria/fevers (Khosla, 1995). In customary medication aqueous concentrate of Tulsi is utilized for the cure of common cold and fever and the powder made out of it is used to cure jaundice and for assuaging blood pressure (Palla, 2012).

*Medicinal benefits of Tulsi:*

**Fever and Common Cold:** Extract from leaves of the basil is suitable in different kinds of fevers. As in the rainy season most of cases of malaria and dengue are seen. In such time, delicate leaves overflowed with tea can be utilized as preventive specialist against these maladies (Kumar et al., 2010).

**Cough:** Tulsi has significant part of that makes up the constituent of numerous ayurvedic hack syrups and expectorants. It helps in curing inflammations of the bronchi and ailments like asthma. Masticating the leaves of Tulsi helps to prevent cold and flu (Chandra et al., 2016).

**Throat problems:** The leaves of Tulsi have expectorant properties and juice is effectively applied in catarrhal bronchitis and chest troubles and throat (Khosla, 1995).

**Renal stones:** The ethanolic essence extracted from the leaves of the Tulsi is known profoundly to fight against calcium stone inhibition activity as compared to various other marketed products (Garg et al., 2016).

**Cardiovascular disorder:** Tulsi is also used in curing and preventing diseases pertaining to heart and blood vessels by lowering of blood lipid content, decreasing ischemia, limiting cardiac strokes, and reducing hypertension (Sharma et al., 2018).

**Arthritis:** Oil of Tulsi has been found to have a great effect against formaldehydes or ancillary induced arthritis (Upadhyay, 2017).

**Stress:** Tulsi is helpful for the reduction of stress, provides relaxation to the mind and helps in ameliorating memory power. It also prevents hypoxia, and it helps the body to survive further long when the body is suffering from anoxia (Singh et al., 2010).

**Mouth Infections:** Chewing a few leaves of Tulsi is seen to be working significantly against ulcer and infections in the mouth (Tiwari, 2014).

**Insect bites:** Acts as a prophylactic agent against biting and stinging of insects. A paste or fresh juice of the leaves is applied to the wound or bite or the affected parts (Kumar et al., 2010).

**Skin diseases:** Tulsi is useful in the ailments like dermatitis and psoriasis and helps skin ailments like disease and bacterial sickness. With antibacterial properties that it has, Tulsi empties risky poisons and recovers skin (Kumar et al., 2010). Paste of Tulsi leaves is applied for various other ailments of skin. Fundamentally, if there should be an occurrence of ring worm or other skin related maladies, for



example, Leucoderma. It is also used in curing chicken pox in which Tulsi leaves are taken with saffron (Joshi, 2017).

Tooth decay: Tulsi is extensive qualities also include acting against *Streptococcus mutans*, the organism which is responsible for inducing decay in the tooth. It is also be utilized as a supplement to inorganic mouth washes for treating bad breath, gum disease and mouth ulcers (Vasudevan et al., 1999).

Eye Disorders: Tulsi consumed along with Triphala is used in preparation of optic drops which is very essential for the eye treatment (Patil et al., 2011).

Piles Problem: Tulsi is likewise helpful for treating heaps. Douse five Tulsi leaves in drinking water for 30 minutes and drink the water subsequently. By following this procedure routinely you could dispose of heaps (Sharma et al., 1998).

Stomachache: Consuming Tulsi juice or syrup is helpful to reduce stomachache and cramps (Kumar et al., 2010).

Infection protection: Tulsi possesses various remedies against bacteria, viruses, and funguses. Function against various diseases and infections causing pathogens. It stimulates defensive property of body against infective threats by intensifying immune responses in different organisms (Vasudevan et al., 1999). Tulsi essential oil made out of Tulsi is a valuable antimicrobial agent for curing of skin infections or to prevent infection by acting as a wound dressing element (Yamani et al., 2016).

Malaria Fever: Tulsi is consumed as a perspiration inducing agent in fevers caused by malaria by extraction of its roots.

Liver Protection: In liver, it mitigates the metabolic breakdown and aides in expelling hazardous synthetic compounds from the blood and detoxifies the body. Anti-diabetic-insulin and glucose normalizes blood sugar and blood-lipid levels (Sai Krishna et al., 2014).

Lowers blood glucose: It also helps to balance sugar in the blood and regulates insulin metabolism that can reduce fasting blood glucose. It also acts as ulcer healer by acting as therapeutic agent against peptic ulcer disease (Sai Krishna et al., 2014).

Anti-Fertility tool: Ursolic acid present in the leaves of Tulsi is responsible for anti fertility activity. In guys, consumption of Tulsi leaves diminishes spermatogenesis by impeding Sertoli cells action (Prakash & Gupta, 2005).

## CONCLUSION

All these medicinal ingredients make Tulsi very important holy basil for longer and peaceful life. It has high traditional value in Hindu as well as other societies. This small plant is certainly a very good source of medicinal properties. Tulsi is appraised as the “Queen of Herbs” on account of its diverse curative abilities & mythological values. Tulsi has indeed an ample range of benefits which is traditionally believed and scientifically proven. These studies demonstrated that the habitual insertion of *Ocimum sanctum* i.e., Tulsi to the menu, also in medications can certainly aid in safeguard or demotion of various health settings and warrants additional medical appraisal.



## DECLARATION OF CONFLICT OF INTEREST

We have no conflict of interest to declare.

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