

Ocimum sanctum: The Queen of Herbs

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ABSTRACT: The predominant cause of global morbidity and mortality is lifestyle-related chronic diseases, many of which can be addressed through Ayurveda with its focus on healthy lifestyle practices. Herbal medicine, the backbone of traditional medicine in many countries have played an important role in curing the diseases of humans since ancient time. *Ocimum sanctum* (Tulsi) herb has been known from the vedic period. Its extract has numerous pharmacological activities like hypoglycaemic, immunomodulatory, analgesic, anti-stress, antipyretic, anti-ulcerogenic, anti-inflammatory, anti-hypertensive and anti-bacterial. The active constituents of herb include volatile oil eugenol and B-caryophyllene, flavonoids and a number of other components present in fixed oil.

KEYWORDS: *Ocimum sanctum*, Tulsi, Medicinal plant, Ayurveda.

I. INTRODUCTION

Ocimum sanctum commonly known as holy basil or tulsi is considered as a sacred plant in hindu belief. It is an aromatic perennial plant in the family Lamiaceae. It is native to Indian subcontinent and widespread as cultivated plant throughout the south east asian topics^[1]. Hindus regard it as an earthly manifestation of the goddess Tulsi; she is regarded as the avatar of Lakshmi, and thus the consort of the god Vishnu. Many Hindus have tulsi plants growing in front of or near their home, often in special pots or a special masonry structure known as *Tulsi Vrindavan* as this is related to their culture. Traditionally, Tulsi is planted in the center of the central courtyard of Hindu houses^[2]. The ancient scholastic work included in the Atharvaveda consists rich heritage of knowledge on preventive and curative medicines. It has made important contribution to the field of science from ancient times to modern research because of its large number of medicinal properties. Plants have always been an important source of drugs. A large number of the world's population, especially in developing countries, depend upon medicinal plants as an alternative and complimentary drugs therapy for various ailments. Some of the most common practices involve the use of crude plant extracts, which may contain a broad diversity of molecules with often unknown biological effects^[3]. The extraction from different parts of *O. sanctum* has its own value as either a therapeutic or curative effect. Plant-based natural constituents can be derived from any part of the plant like bark, leaves, flowers, roots, fruits, seeds and so on, that is any part of the plant may contain active components. Presently we are in the midst of a global pandemic caused by modern lifestyles and their associated lack of physical activity, high intake of sugar, fat, salt, alcohol and tobacco and exposure to a toxic cocktail of industrial chemicals. Tulsi is perhaps one of the best examples of Ayurveda's holistic lifestyle approach to health.

Types of tulsi : *Ocimum tenuiflorum* (or *Ocimum sanctum* L.) includes 2 botanically and phytochemically distinct cultivars that include Rama or Sri tulsi (green leaves) and Krishna or Shyama tulsi (purplish leaves)^[4,5], while *Ocimum gratissimum* is a third type of tulsi known as Vana or wild/forest tulsi (dark green leaves)^[6,7].

Synonyms^[8]

- *Ocimum sanctum* L.
- *Ocimum sanctum* var. *angustifolium* Benth.
- *Ocimum sanctum* var. *cubensis* Gomes

Morphology^[9]

- Holy basil is an erect, branched subshrub, 30–60 cm (12–24 in) tall with hairy stems.
- Leaves are green or purple; they are simple, petioled, with an ovate, up to 5 cm long blade, which usually has a slightly toothed margin; they are strongly scented and have a decussate phyllotaxy. The purplish flowers are placed in close whorls on elongated racemes^[12]. The three main morphotypes cultivated in India and Nepal are *Ram tulsi* (the most common type, with broad bright green leaves that are slightly sweet), the less common purplish green-leaved (Krishna tulsi) and the common wild *vana tulsi*.

Chemical composition^[10]:

Some of the phytochemical constituents of *tulsi* are oleanolic acid, ursolic acid, rosmarinic acid, eugenol, carvacrol and linalool.

Traditional uses [11,12,13,14,15,16,17,18,19,20]

Traditionally, *Ocimum sanctum* is taken in many forms, as herbal tea, dried powder or fresh leaf. For centuries,

- the dried leaves of *Tulsi* have been mixed with stored grains to repel insects.
- *Tulsi* extracts are used in Ayurvedic remedies for common cold, headaches, stomach disorders, inflammation, heart disease, various forms of poisoning and malaria.
- *Tulsi* has also been shown to boost defenses against infective threats by enhancing immune responses in nonstressed and stressed animals and healthy humans.
- *Tulsi*'s activity against water-borne and food-borne pathogens further suggests that it can be used in the preservation of food stuffs and herbal raw materials as well as for water purification and as a hand sanitizer.

Various activities of *Ocimum sanctum*

Hypoglycaemic and Hypolipidemic activity [21,22]

Ocimum sanctum has numerous pharmacological activities. Oral preventing tonic convulsions induced by transcorneal electroshock. The analgesic action is exerted both centrally as well as peripherally and involves interplay between various neurotransmitter systems.

Antimicrobial activity [23,24,25]

The narrowest spectrum of antibacterial activity was observed in *Ocimum sanctum*. The crude aqueous extract of leaf possesses some antibacterial and immunomodulatory active principles. *Neisseria gonorrhoea* clinical isolates and WHO strains were found to be sensitive to extracts. The ethanolic extracts from the leaves showed better activity against the β -lactamase producing methicillin-resistant staphylococcus aureus strains.

Anti-ulcer activity [26,27]

Holy basil is reported to possess potent anti-ulcerogenic as well as ulcer-healing properties and it is due to its ability to reduce acid secretion and increase mucous secretion. The fixed oil of *tulsi* was found to possess significant anti-ulcer activity against Aspirin and alcohol.

Antioxidant activity [28,29]

It has significant ability to scavenge highly reactive free radicals. Antioxidant bioassay-directed extraction of the fresh leaves and stems of *tulsi* extract yielded: isothymonin, apigenin, rosmarinic acid appreciable quantities of eugenol. Eugenol is a major component of the volatile oil, and other compounds also demonstrated good antioxidant activity.

Anti-inflammatory activity [30]

Gas liquid chromatographic analysis of fixed oil of *Ocimum sanctum* revealed the presence of five fatty acids. The triglyceride fraction of the oil showed higher protection compared to fixed oil against carrageenan induced paw edema and acetic acid induced writhing in rats and mice, respectively.

Antipyretic activity

Prevents, removes or reduces fever. Treatment for viral encephalitis, malaria and typhoid; The Imperial Malarial Conference has declared *Tulsi* to be a genuine remedy for malaria. Drug and nicotine withdrawal *Tulsi* oil is also used as ear drops in case of pain.

Immunomodulatory activity [31]

The seed oil can modulate both humoral and cell mediated immune responsiveness and these immunomodulatory effects may be mediated by GABAergic pathways. Godhwani et al indicated an immunostimulant capability, which may be contributory in explaining the adoptogenic action of the plant.

Antistress activity [32]

Tulsi has been used extensively throughout its history in India as a supreme anti stress solution, used for claiming the distraught and dealing with long-term irritants. In a 2000 study performed at the University of Madras, in Madras, India, researchers tested *Tulsi* extract on rats who were also subjected to acute levels of noise. The stress altered levels of several brain chemical makers including corticosterone were lowered after feeding the rats.

II. CONCLUSION

Modern day scientific research into tulsi de in Hinduism monstres the many psychological and physiological benefits from consuming tulsi, which celebrates tulsi as a plant that can be worshipped, ingested, made into tea and used for medicinal and spiritual purposes within daily life. A number of pharmacological effects like hypoglycaemic, immunomodulatory, antistress, anti-inflammatory, antiucrogenic, anti-hypertensive, CNS depressant, radio protective, antitumour and antimicrobial of *Ocimum sanctum* have been studied. However much more studies are still required to explore other potential activities of this plant.

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