

## SACRED TULSI (OCIMUM SANCTUM L.) IN TRADITIONAL MEDICINE AND PHARMACOLOGY

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**ABSTRACT:** *Scared Tulasi (Ocimum sanctum L.) of family Lamiaceae is a wonder ayurvedic herb which is known for its tremendous medicinal properties both in traditional folklore as well as pharmacological system of medicines. Every part of the plant finds its use in one form or the other. Keeping in view the importance of the plant, an attempt has been made to review the various studies carried out in traditional system of medicine as well as modern pharmacological investigations.*

### INTRODUCTION:

*Ocimum sanctum* (Fam. Lamiaceae) among all the known species of genus *Ocimum* has been found to attain an very important place in the traditional as well as modern pharmacological systems of medicine of many Asian, African and South American countries of the world. The medicinal properties of *Ocimum* species have been mentioned in the most ancient and fundamental medical literature of Hindus namely *Charak Samhita* and *Susruta Samhita* (about 1000 BC). Charak describes *O.sanctum* as curative of *Kapha* and *Vata*. The Indian Materia Medica (Nandkarni and Nandkarni 1954) which is a compilation of Unani and Ayurvedic system of medicine also refers *Ocimum sanctum* plants as highly medicinal having properties as alexipharmic, antiemetic, antipyretic, antiseptic, carminative, demulcent, diaphoretic, expectorant and stimulant and therefore, have recommended for the treatment of diseases like catarrh, bronchitis, gastric and genitor-urinary disorders, malaria fever,

rheumatism, skin diseases etc. It is because of their manifold curative uses that the early Indians considered this plant highly sacred and worth worshipping and hence gave the name Sacred *Tulasi* or Holy basil. Being so rich a genus for having tremendous medicinal potentials, has prompted to review the studies carried out in its traditional system of medicine and modern pharmacological investigations.

### Botany

There are at least two types of Sacred *Tulasi* met within the cultivation, the Green type and the Purple type. The green type also called *Sri Tulasi* or *Rama Tulasi* is the most common one whereas the second type bearing purple leaves is not that common and is called as *Krishna Tulasi* or *Shyam Tulasi*. However the species irrespective of its colour in Sanskrit is called '*Tulasi*' 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.

### **Religious and Folklore Practices**

Sacred Tulasi has long been used as an important pot herb for having its age old sanctity in performing various religious rituals and beliefs by the common village folklore. The plant is usually grown in special pots with fine decorative pedestal in the court yards of temples and in most of the Hindu Houses. Some ancient Hindu poets described *Ocimum* plants as highly sacred saying that one who carefully grows and worships them daily is protected from misfortunes, sanctified and are entitled to go to heavens. The story goes further saying that the plant is transformed nymph Tulsī a beloved of Lord Krishna. Even to this day, the village women folk keep the plant with great love and care, the ground near the plant is meticulously kept clean and incense is burnt to make the atmosphere pleasant and sacred. A lamp or an earthen pot (*Diya*) is kept lit throughout the night. In the hottest months of the year, a utensil of water is hung over it with a small hole in the bottom so that the plant receives moisture during day and night. It is also believed that salvation is assured to anyone who tends the plant with great care and emotion and to walk around it, is considered meritorious

act. Village women gather around *Tulasi* plant and sing devotional songs in its praise and light earthen lamp with wicks soaked in ghee (butter oil) at dusk.

*Tulasi* plant is considered to be so sacred that even during solar or lunar eclipses; its leaves are kept in the stored food articles for keeping the articles protected from the bad effects of eclipses. Daily use of *Tulasi* leaves along with water kept over-night in the copper pot is considered to be good for gaining general health and vitality and for the same reason. *Tulasi* leaves are used as *Prasad* in the temples and in the Hindu houses. Powdered dry leaves are also boiled in water for about 5 mts,  $\frac{1}{4}$  of the leaves is mixed with ginger powder and black pepper in equal quantity (Ration 4:2:2:10 water) and filtered, filtrate taken with sugar in the morning and evening relieves cold effects, headache, sneezing, pain on the swellings, indigestion, early stages of malaria/fevers. Under favorable circumstances, the plant grows to a considerable size and furnishes a woody stem large enough to make beads for the rosaries used by Hindus on which they count the number of recitations of their deity's name. 21 fresh leaves made into paste with curd and taken 2-3 times a day with honey on empty stomach checks the cancer and improves memory.

### **Medical potentials and uses**

Sacred *Tulasi* is ranked among few wonder plant for having enormous medicinal potentialities which acts as panacea for a number of ailments and diseases. Each and every part of the plant finds its use in one form or the other. The plant has a pungent bitter taste, hot, stomachic, cholagogue, anthelmintic, alexiteric, antipyretic, useful in diseases of the heart and blood, leucoderma, strangury, asthma, vomiting, halitosis, lumbago pains, hiccough, painful eyes,

purulent discharge from the ear, causes burning sensation (Ayurveda vide Kritikar and Basu, 1935) Santals use the plant in fever, dropsy and anasarca, hemiplegia, vomiting, constipation, cholera, cough, postnatal complaints, haemorrhage, septicaemia and dogbite (Jain and Tavafdar, 1970). *O. sanctum* belongs to *Surasadi* group of drugs most of which are reputed vermifuges.

The leaves of *O. sanctum* have expectorant properties and their juice is usefully applied in catarrhal bronchitis and throat and chest troubles. A decoction of leaves along with tea and milk has proved extremely useful in malaria. It is very helpful in curing colds, cough and indigestion. The dried leaves are powdered and employed as snuff in ozaena (offensive discharge from the nose). They are effectual means of dislodging maggots (Chopra et al, 1956). Juice of the fresh leaves, flower tops and the slender roots are considered to be a good antidote for snake bite and scorpion sting. In Ceylon, the herb is used in decoction for cough and catarrh, sometimes chewed as a substitute for betel. The juice of the leaves possesses diaphoretic, antiperiodic, expectorant and stimulant properties (Wealth of India, 1966). Ringworm rashes and other skin diseases can be cured by applying leaf juice or paste which is also used against earache and other minor infections of the ear, eyes and nose (Raj Nighantu vide Pharmacographia India Dymock et al, 1980). It is also believed that five tender leaves along with five black pepper taken empty stomach every morning strengthens the weak heart and also cures and prevents all types of fevers particularly malaria. Plant leaves are also used as condiment in salad and other foods. Few fresh leaves taken with tea or milk checks vomiting, acidity of the stomach and heartburn.

The seeds of *Tulasi* are mucilaginous and demulcent and are given in disorders of genitor-urinary system and its seed paste about 1 gm reduces burning sensation of the urine. They contain antistaphylocoagulase which can be extracted with water and alcohol (Kirtikar and Basu, 1935, Bhat and Broker, 1954). The seeds of the plant give a greenish yellow fixed oil with good drying properties. They contain a mucilage (hexuronic acid, 27.2, pentose, 38.9 and ash 0.290) which on hydrolysis yields xylose and an acid polysaccharide, the latter is possibly composed of xylose and glucuronic acid in 2:1 molar ratio (Nandkarni and Patwardhan, 1952). The seeds also show anticoagulase activity as evidenced by the suppression of coagulase activity and mannitol ferment ability of pathogenic *Staphylococci*. About 2g of seeds taken with warm water removes constipation and in cold water checks diarrhoea.

The fresh roots of *O. sanctum* ground with water and applied to the stings of wasps and bees and the bites of worms and leeches. The bruised fresh roots, stem and leaves are applied to the bites of mosquitoes.

The essential oil obtained from leaves of *Tulasi* is applied to reduce joint pains and possesses significant insecticidal and larvicidal activity against house flies, blue bottle flies and specially mosquitoes (Chopra et al, 1941). The plant therefore, forms a medicinal constituents for almost all emergencies to meet the day to day requirements and can act as natural first aid kit at no expense. The plant thus deserves to be grown in every house.

### **Pharmacological studies**

Lot many pharmacological investigations have been carried out in *O. sanctum* during the recent past and the studies show that the

plant possesses some vital biological activity against a number of ailments and diseases.

*Tulasi* plant has been reported to show abortifacient and antifertility activity. The aqueous extract at a dose of 100 mg/kg showed anti implantation and abortifacient action (Vohra et al 1969). The benzene extract of the leaves (100 mg/kg) showed the effect in 80% rats whereas the petroleum ether extract showed the effect in only 60% animals but the extract did not reveal an early abortifacient activity. (Batta and Santhakumari, 1971). The leaves fed to albino rats (male and female) in a dose of the animals; however, it led to a large number of pseudopregnancies in rats. The occurrence of pseudopregnancies in rats. The occurrence of pseudopregnancies was attributed more to the effect of the extract on the male rats rather than the female ones (Saha and Kasinathan, 1965).

Histological and biochemical studies on mice fed with leaves showed evidence of mild impairment of spermatogenesis with significant reduction of seminal PH. There was also decrease in reducing substance, acid and alkaline phosphates and mucoproteins. Treated male mice failed to fertilize female of proven fertility (Kasinathan *et al*, 1972). Seth *et al* (1981) reported antispermatogenic effect of *O. sanctum*. The benzene extract of leaves in 100, 150 and 200 mg/kg doses altered the weights of testes in male, rats without any significant effect on the epididymis, seminal vesicle, prostatic and vas deferens. A significant reduction in the sperm count and motility was also observed.

Adaptogenic (anti-stress) activity of *O. sanctum* (dried powder) has been reported by Bhargava and Singh (1981). The plant prevented stress induced peptic ulcer and hyperacidity (Wagh, 1977 and

Seethalakshmi et al, 1982). It is also prevented milk induced leucocytosis in mice. Thus the plant manifested a non-specific type of protection against a variety of stress included biological changes. *O. sanctum* is also reported to possess anti-tuberculosis substance (Gupta and Vishwanathan, 1955), property of therapeutic effect (Gonopoti et al, 1964). Powerful germicidal and antiseptic properties of the plant have been reported by Nene et al (1968). There is also a report of alleged antiasthmatic potential of *Tulasi* leaves in the treatment of human bronchial asthma (Polit et al, 1983, Singh and Agarwal, 1991). Rajalakshmi et al (1988) have reported the use of the plant as an ingredient of Tefroli, a proprietary product for viral hepatitis. The plant is used to clear the bilirubin from the urine and S.G.P.T levels showing a beneficial change (Sankaran, 1980). The species is also reported to have therapeutically active constituents like antibiotic, anticancerous etc. (Mhaskar and Calus, 1931., George et al, 1947, Joshi and Magar, 1952., Matsushire and Nakada, 1955 Dhar et al, 1968 and Hartwell, 1969).

*Tulasi* plant was also featured in the Indo-Soviet joint meeting (vide Pafai journal Vol.II, No.1, pp.52, 1989). On the collaborative research and development programme. The Smarand Medical Research Institute, USSR with which Indian doctors are collaborating in studies on tiredness caused by stresses have confirmed that the wonder Indian herb *Tulasi* (*O. sanctum*) has anti-stress property which can help cure the exhaustion caused by physiological strain.

### **Clinical Studies**

In a preliminary clinical trial on 16 patients suffering from viral encephalitis, the aqueous extract of *O. sanctum* leaves has

been reported to lead to a higher survival rate of patients than that in a steroid treated group of 10 patients. The incidence of residual neurological deficit in a period of one month was reported to be low in the extract treated patients (Das et al, 1983). Skina et al (1990) in a preliminary psychopharmacological evaluation of ethanol leaves extract of *O. sanctum* has found to prolong the time of lost reflex in mice due to pentobarbital, decreased recovery time and severity of electroshock and pentylenetetrazole induced convulsions and decreased apomorphine-induced fighting time and ambulation in "open field" studies. Using a behavioural despair model

involving forced swimming in rats and mice, the extract lowered immobility in a manner comparable to imipramine. This action was blocked by haloperidol and sulphiride, indicating a possible action involving dopaminergic neurons. In similar studies there was a synergistic action when the extract was combined with bromocryptine, a potent D2 – receptor antagonist.

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#### REFERENCES

1. Batta, S.K. and Santhakumar, G. Indian J. Med. Res. 59:777-781 (1971)
2. Bhargava, K.P. and Singh, N. Indian J. Med. Res. 73: 443 – 451 (1981)
3. Bhat, J.V. and Broker, R.J. Sci. Ind. Res. 12B : 540 – 542 (1953)
4. Bhat, J.V. and Broker, R.J. Sci. Ind. Res. 13B : 305 (1954)
5. Chopra, R.N., Roy, N.D. and Ghosh, S.M.J. Malaria Inst. India. 4: 109 (1941)
6. Chopra, R.N., Chopra, I.C., Handa, K.L. and Kapoor, L.D. Chopra's Indigenous Drugs of India 2<sup>nd</sup> Edition, U.N. Dhur and Sons Private Ltd., Calcutta, 1956.
7. Das, S.K, Chandra, A., Agarwal, S.S. and Singh, N. Antiseptic, 80 : 332 (1983)
8. Dhar, M.L., Dhar, M.M., Dhawan, B.N. and Roy. C.Ibid, 6(4):232 – 247 (1968)
9. George, M., Venkataraman, P.R and Pandalai, K.M.J. Sci. Industr. Res. 6B (3), 42-46 (1947).
10. Gonopoti, R.D., Congr. Luso-espangarm 3:187 – 191 (1952).
11. Gupta, K.C. and Vishwanathan, R. Antibiotics and Chemotherapy, 5: 22 – 23 (1955)
12. Hartwell, J.L. Lloydia, 32 (3) : 247 – 296 (1969).
13. Jain, S.K. and Tarafder, C.R. Eco. Bot., 24 : 241 (1970)

14. Joshi., C.S. and Magar, N.G.J. *Sci. Ind. Res.* 11B: 261 (1952)
15. Kashianthan, S., Ramakrishnan, S and Basu, S.L. *Indian J. Exp. Biol.* 10 : 23-25 (1972).
16. Kirtikar, K.R and Basu, B.D. *Indian Medicinal Plants*, Vol. III 2<sup>nd</sup> Edition (1935) Lalit Mohan Basu, Allahabad, 1959 – 1968.
17. Luthy – Nydia, Ortelio and Martinex Fortun. *J. Sc.*, 64 (3) : 223 – 224 (1964).
18. Matsushiro, A. and Nakada, D. *Antibiotics and Chemotherapy*, 5: 22 – 23 (1955)
19. Mhaskar, K.S and Caius, J.F. *Ind. Med. Res. Mem.* 19 : 58 (1931)
20. Nandkarni, G.B. and Nandkarni, K.M. *Indian Materia Medica*, (1954). Popular Book Depot., Bombay.
21. Nandkarni, G.B and Patwardhan, V.A. *Curr. Sci.*, 21 (1) : 68 – 69 (1952).
22. Nene, Y.L. Thapliyal, P.N and Kumar, K. Labdev; *J. Sci. Technol.* 68 : 226-228 (1968)
23. Palit, G., Singh, S.P., Singh, N., Kohli, R.P. and Bhargava K.P. *Aspects Allergy Immunol*, 16 : 36 (1983).
24. Rajalakshmi, G., Sivanandam, G. and Veluchamy, G.J. *Res. Ayur, Sidha*, IX (3&4) : 118 – 123 (1988).
25. Dymock, W., Warden, C.J.H. and Hooper, D. (Rpd, 1976) *Pharmacographia Indica*, Vol. III, (1980) M/S. Bishen Singh Mahindra, Pal Singh, Dehra Dun (Pub.) Press Delhi – 6.
26. Saha, J.C and Kasinathan, S. *Indian Med. Gaz*, 4:65 (1965)
27. Sankaran, J.R. *Antiseptic*, 77 : 643 – 651 (1980)
28. Seethalakshmi, B., Narasappa, A.P. and Kenchaveerappa, S. *Indian J. Pharmacol*, 14 : 63 (1981).
29. Seth, S.D., Johri, N and Sundaram K.R *Indian J. Exp. Biol.*, 19 : 975 – 978 (1981).
30. Singh, S. and Agarwal, S.S. *Int. J. Pharmacognosy*, 29 (4) : 306 – 310 (1991).
31. Singh, T.J., Dasgupta, P. Khan, S.Y. and Mishra, K.C. *Indian J. Pharm*, 32 : 92-95 (1970).
32. Skina, M.R., Dandiya, P.C., Hamdard, M.E. and Hameed, A.J. *Ethnopharmacology*, 28 : 143 – 150 (1990)

33. Vohra, S.B., Garg, S.K. and Chaudhary, R.R. Indian J. Med. Res. 57 (5) : 89 – 899 (1969)
34. Wagh. S.Y. Maharashtra Med., J., 24 (5) : 223 – 227 (1977)
35. Wealth of India Raw Materials Publications and Information's Directorate, Council of Scientific and Industrial Research, New Delhi Vol. Vii, (1966).