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AN OVERVIEW OF OCIMUM TENUIFLORUM

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Abstract:

To treat human illnesses Since ancient times, people have been using plants as human substances and remedies. Numerous plants have long been used throughout India's diverse medical systems and regional health customs. The plants in the genus Ocimum, which belong to the Lamiaceae family, are very significant for their therapeutic potential among the plants recognized to have medicinal significance. One of the holiest and most treasured of the various medicinal and health-promoting herbs of the Orient is tulsi, the fabled "Incomparable one" of India. Traditionally, Tulsi is consumed as a fresh leaf, dried powder, herbal tea, or combined with ghee or honey. The dried leaves of tulsi have been combined for ages.

Key words *:Ocimum sanctum , Herbal tea , Remedie*

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INTRODUCTION:

Tulsi is a fragrant plant that belongs to the Lamiaceae (tribe ocimeae) family of basils. It is believed to have originated in north central India and is now native to the tropical regions of the eastern continent.Tulsi is regarded as a "elixir of life" in Ayurveda and is referred to as "The Incomparable One," "Mother Medicine of Nature," and "The Queen of Herbs."

History:

Over 5,000 years ago, tulsi plants originated on the Indian subcontinent. The plant is found in Southeast Asia and India, where it grows well in warm, tropical regions. It was seen as a symbol of purity and was essential to Ayurvedic healing treatments.

Tulsi is revered in mythology and spirituality because it is closely associated with the Hindu deity Tulsi. The tulsi plant, which stands for purity, devotion, and endless life, was said to be a manifestation of the goddess herself.

In the legend surrounding this sacred plant, Tulsi, a dedicated lady known for her unshakable devotion, was changed into a plant as a symbol of her tenacity and faith. She remained a crucial component of Hindu ritual and a symbol of sanctity even in her plant form.

Scientific name: Ocimum tenuiflorum

Biological source :Tulsi consists of the fresh and dried leaves of ocimum species like ocimum sanctum.L and bascillum.

Chemical constituents: the leaves of ocimum sanctum contains 0.7% volatile oils comprising about 71%eugenol and 20%methyl eugenol.

Taste : Astringent sometimes bitter flavour

Odour : pungent, spicy ,and minty with sweet basil and cloves.

Origin : North India

Family: Lamiaceae

Characteristic feature:

- The tulsi plant has a distinct taste and qualities
- It is pungent and bitter
- The tulsi plant has qualities like lightness dryness and piercing nature

- **Types of tulsi:**

- Shukla tulsi [white variety]
- Krishna tulsi [black variety]
- Vana tulsi [wild leaf basil]

Classification of Tulsi

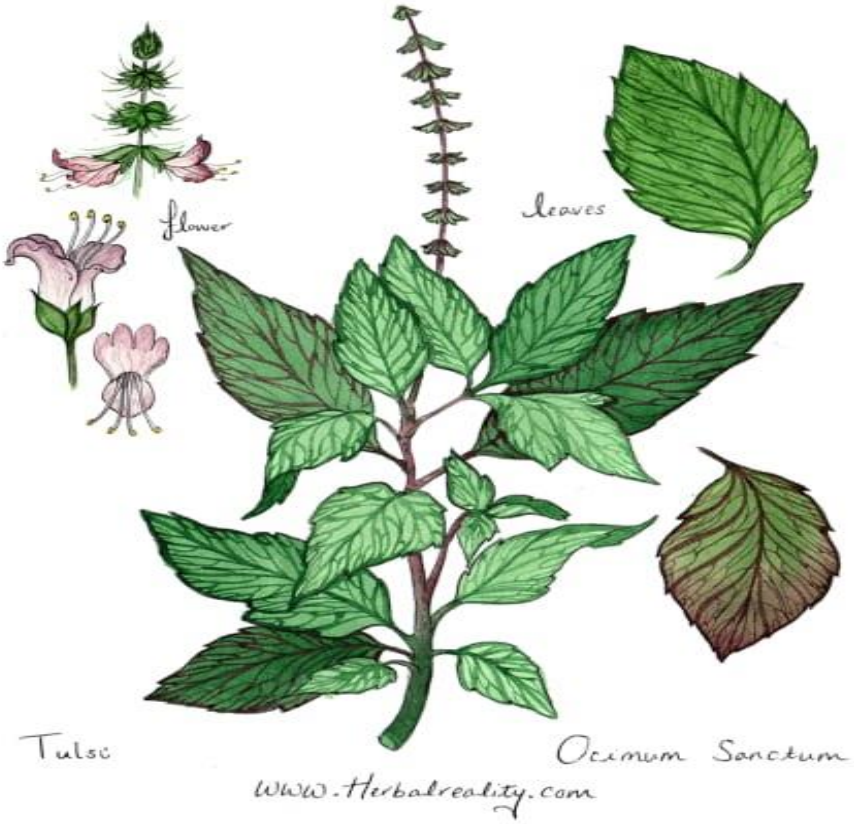
Kingdom : Plantae
Sub kingdom : Tracheobionta
Super division : Spermatopta
Division : Magnoliophyta
Class : Magnoliopsida
Subclass : Asteridae
Order : Lamiales
Family : Lamiaceae
Genus : Ocimum.Sanctum

Synonyms:

- Geniosporum tenuiflorum
- Lumnitzera tenuiflora
- Moschosma tenuiflorum
- Ocimum hirsutum Benth
- Ocimum inodorum Burm
- Ocimum monachorum
- Ocimum sanctum
- Ocimum subserratum
- Ocimum tomentosum
- Plectranthus monachorum

Botanical Discription:

When fully grown, the tussi plant can reach heights of 30 to 60 feet and has a hairy stem. It is a multibranched subshrub that is upright. Tulsi leaves have a simple petiole, green and purple color, and an oval blade that can grow up to 5 cm long and have a slightly toothed edge. The flowers of tulsi are likewise purple to reddish in color and grow in small, dense clusters atop cylindrical spikes. Tulsi seeds range in color from yellow to reddish, and the fruits are tiny .



Phytochemical chemical constituents:
Some phenolic chemicals, including sictirsilineal, circimantin, isothy musin, apigenin, and rosamenic acid, as well as significant amounts of eugeno, were extracted from fresh leaves and stem of Ocimum saritum. 0.7% of the volatile oils in ocimum sanctum leaves are made up of 20% methyl eugenol and roughly 71% eugenol. Caruacrol and sesquiterpine hydrocarbon caryophyllene are also present in the oil. From an aqueous leaf extract of Ocimum sanctum, two flavonoids, orientin and vicenin, have been identified.
Traditional uses: Because it extends life, tulsi is frequently referred to as "the elixir of life." Various plant parts are used in the Ayurvedic and Siddha systems of medicine to prevent and treat a wide range of illnesses and common ailments, such as the common cold, headache, flu, cough, sore throat, bronchitis, asthma, hepatic diseases, malaria fever, fatigue, skin diseases, wounds, flatulence, migraine headaches, arthritis, digestive disorders, night blindness, diarrhea, and influenza. The leaves have calming and memory-enhancing properties. Chewing Tulsi leaves also treats mouth ulcers and infections.

Pharmacological activity:

- **Anticancer activity:**

Since the 1970s, cancer has become the primary cause of mortality in numerous developing nations. There has been a rise in cancer-related illness and mortality in both industrialized and developing nations as a result of dietary and lifestyle changes, as well as the availability of curative therapy for many infectious diseases. The accepted cancer treatment regimens of radiation, chemotherapy, and surgery are expensive, deformative, and fraught with severe side effects, not to mention relapses. Many plants used in Ayurveda have antitumor and anticancer effects. Mice with solid Sarcoma-180 tumors lived longer when exposed to an ethanolic extract of ocimum sanctum . Some researchers have investigated ocimum sanctum's anti-cancer properties using the Lewis lung carcinoma animal model.

- **Antimicrobial activity:**

Whereas AlE of OS shown growth inhibition for Vibrio cholerae, AqE of OS demonstrated growth inhibition for Klesbiella, E. coli, Proteus, and Staphylococcus aureus. It was also discovered that OS's AlE was effective against S. aureus strains that are resistant to both popular beta lactam antibiotics and drugs. It was also discovered that OS was active

against strains of Neisseria gonorrhoea that were resistant.33] OS fixed oil shown strong antibacterial action against S. aureus, Pseudomonas aeruginosa, and Bacillus pumilus. The bactericidal action of OS fixed oil may be enhanced by a higher linolenic acid concentration.

- **Analgesic activity:**

Using tail flick, tail clip, and tail immersion methods as experimental pain models, it was discovered that the OS oil lacked any analgesic effect. Nonetheless, it demonstrated dose-dependent efficacy against the acetic acid-induced writhing method in mice. The oil's ability to prevent writhing is hypothesized to be peripherally mediated as a result of prostaglandins, histamine, and acetylcholine working together to limit movement.

- **Antiulcer activity:**

Significant antiulcer action was elicited by the intraperitoneally injected fixed oil of OS against rats' ulcers produced by stress, aspirin, indomethacin, alcohol (ethanol 50%), histamine, reserpine, and serotonin. Because of its antisecretory, histamine antagonistic, and lipoxygenase inhibitory properties, the fixed oil exhibited considerable antiulcer action.

- **Antipyretic:**

The effectiveness of OS fixed oil as an antipyretic was assessed by subjecting rats to pyrexia caused by the typhoid-paratyphoid A/B vaccination. The oil's antipyretic action was demonstrated by the significant reduction in the fever response upon intraperitoneal injection. The oil had antipyretic efficacy equivalent to aspirin at a dose of 3 ml/kg. The fixed oil's antipyretic properties may also be characterized by its prostaglandin inhibitory effect.

Cultivation :

Materials :

1. Tulsi plants (Ocimum sanctum)
2. Soil with good drainage
3. Fertilizers (organic or inorganic)
4. Water
5. Pruning tools (scissors, pruning shears)
6. Extraction solvents (ethanol, methanol, water)
7. Equipment for drying (oven, dryer, shade drying)
8. Grinding machinery (mills, grinders)

Methods :

1. Seed sowing: Sow seeds in nursery beds or directly in fields.
2. Transplanting: Transplant seedlings to larger containers or fields.
3. Soil preparation: Add fertilizers and organic matter to improve soil fertility.
4. Irrigation: Water regularly, maintaining consistent moisture.
5. Pruning: Regular pruning promotes bushy growth and prevents flowering.
6. Pest and disease management: Monitor for pests and diseases, using organic or chemical controls.

Harvesting Methods:

1. Leaf harvesting: Pick fresh leaves at any stage of growth.
2. Flower harvesting: Collect flowers during blooming season.
3. Stem harvesting: Cut stems for propagation or extraction.

Extraction Methods:

1. Solvent extraction: Use ethanol, methanol, or water to extract bioactive compounds.
2. Steam distillation: Extract essential oils.
3. Cold pressing: Extract oil from seeds or leaves.
4. Supercritical fluid extraction (SFE): Use CO2 to extract bioactive compounds.

Drying Methods:

1. Air drying: Dry leaves and flowers in shade.
2. Oven drying: Dry at controlled temperatures (40-60°C).
3. Freeze-drying: Preserve delicate compounds.
4. Spray drying: Dry extracts into powder.

Analytical Methods:

1. Chromatography (HPLC, GC, TLC): Separate and identify bioactive compounds.
2. Spectroscopy (UV, IR, NMR): Analyze chemical structure.
3. Microbial analysis: Evaluate antimicrobial activity.
4. Pharmacological evaluation: Assess bioactivity and efficacy.

Safety Precautions:

1. Handling: Wear protective gloves and masks.
2. Allergic reactions: Monitor for allergic responses.
3. Pregnancy and breastfeeding: Consult healthcare professionals.
4. Interactions: Consider potential interactions with medications.

Extraction :

- **Pre-Extraction Preparation**

1. Cleaning: Wash Tulsi leaves/stems with distilled water to remove dirt and contaminants.
2. Drying: Dry Tulsi leaves/stems using:
   - Air drying (shade drying)
   - Oven drying (40-60°C)
   - Freeze-drying

- Spray drying

3. Grinding: Grind dried Tulsi into a fine powder using:
   - Mills
   - Grinders
   - Mortar and pestle

- **Extraction Methods**

1. Solvent Extraction
   - Ethanol extraction (50-95%)
   - Methanol extraction (80-100%)
   - Water extraction (distilled water)
   - Ratio: 1:5 to 1:10 (Tulsi:solvent)
   - Time: 2-24 hours
   - Temperature: Room temperature or 40°C
2. Steam Distillation
   - Extract essential oils from Tulsi leaves/stems
   - Temperature: 100°C
   - Time: 2-4 hours
3. Cold Pressing
   - Extract oil from Tulsi seeds or leaves
   - Temperature: Room temperature
   - Time: 2-4 hours
4. Supercritical Fluid Extraction (SFE)
   - Use CO2 to extract bioactive compounds
   - Temperature: 40°C
   - Pressure: 300 bar
   - Time: 2 hours

- **Post-Extraction Processing**

1. Filtration: Filter the extract using filter paper or filter funnel.
2. Concentration: Concentrate the extract using:
   - Rotary evaporator
   - Vacuum distillation
   - Lyophilization
3. Drying: Dry the concentrated extract using:
   - Spray drying
   - Freeze-drying
   - Oven drying (40-60°C)

- **Safety Precautions**

1. Handling: Wear protective gloves and masks.
2. Allergic reactions: Monitor for allergic responses.
3. Pregnancy and breastfeeding: Consult healthcare professionals.
4. Interactions: Consider potential interactions with medications.

- **Yield and Composition**

1. Essential oil yield: 1-3% (v/w)
2. Bioactive compounds: Ursolic acid, rosmarinic acid, eugenol, and others

Formulations :

- **Pharmaceutical Formulations**

1. Tulsi Extract Tablets/Capsules: Containing 100-500 mg of Tulsi extract.
2. Tulsi Tea: Dried Tulsi leaves infused in hot water.
3. Tulsi Syrup: Liquid extract of Tulsi in a sugar-based syrup.
4. Tulsi Ointment/Cream: Topical application for skin conditions.
5. Tulsi Mouthwash: Antimicrobial mouthwash.

- **Ayurvedic Formulations**

1. Tulsi Rasayana: Herbal concoction for overall well-being.
2. Tulsi Churna: Powdered Tulsi for digestive issues.
3. Tulsi Kwath: Decoction for respiratory issues.
4. Tulsi Taila: Oil for skin and hair care.
5. Tulsi Vati: Tablet/Capsule for stress and anxiety.

- **Cosmetic Formulations**:

1. Tulsi Face Cream: Anti-aging and antioxidant properties.
2. Tulsi Hair Oil: Promotes hair growth and reduces dandruff.
3. Tulsi Soap: Antimicrobial and antifungal properties.
4. Tulsi Shampoo: Nourishes and protects hair.
5. Tulsi Lip Balm: Soothes and protects lips.

- **Food Supplements:**

1. Tulsi Capsules: Dietary supplement for immune system support.
2. Tulsi Powder: Additive for smoothies and juices.
3. Tulsi Tea Bags: Convenient tea bags for infusion.
4. Tulsi Juice: Fresh or packaged juice.
5. Tulsi Infused Water: Flavored water.

CONCLUSION:

Although there are many different types of herbal plants in the world, Ocimum sanctum, or tulsi, is regarded as the queen of herbs because of its superior medical qualities. Tulsi is well documented in Hindu mythology. Given the health benefits of Tulsi, our Indian forefathers demanded that every home have a Tulsi seedling. Investigations into purifications of Tulsi components and their characterization in terms of chemical natures and bio-pharmacological activities are required, keeping in mind the different medical benefits. These kinds of natural ingredients most likely have the ability to be advantageous yet relatively less harmful. Ocimum plants have the potential to make significant contributions to both the economy and health issues in the long run.

REFERENCES:

1. Godhwani S, Godhwani JL, Vyas DS. Ocimum sanctum: an experimental study evaluating its antiinflammatory, analgesic and antipyretic activity in animals. J Ethnopharmacol, 1987; 21(2): 153-163.
2. Prajapati ND, Purohit SS, Sharma AK, Kumar T. A Hand Book of Medicinal Plant, 1st Ed. Agrobios, India, 2003; 367.

3. Mathew S. and Kuttan G. (1999).Immunomodulatory and antitumour activities ofTinospora cardifolia. Fitoterpia. 70:35-43.
4. hepatocytes in vitro. Cancer Lett, 1998; 128(2):155160.
5. Singh S, Malhotra M, Majumdar DK. Antibacterial activity of Ocimum sanctum L. fixed oil. Indian J Exp Biol 43:2005,835.
6. Singh S, Taneja M, Majumdar DK. Biological activities of Ocimum sanctum L. fixed oil- An overview. Indian J Exp Biol 45:2007,403-412.
7. Joshi H, Parle M. Cholinergic basis of memory improving effect of Ocimum tenuiflorum Linn. Indian J Pharm Sci 68(3):2006,364-365.
8. Pandey BP. Anita in economic botany (Published by Chand & Company Ltd., Ramnagar.
New Delhi, 1990; 294.
9. Gupta SK, Prakash J, Shrivastava S. Validation of claim of tulsi Ocimum sanctum as
medicinal plant. Indian J. Experimental biology, 2002; 40(7): 765-773.
10. Jeba CR, Vaidyanathan R, Kumar RG. Immunomodulatory activity of aqueous extract of ocimum sanctum in rat. Int J on Pharmaceutical and Biomed Res, 2011; 2: 33-38.
11. Simoons, Frederick J. (1998). Plants of life, plants of death. Univ of Wisconsin Press. pp. 7-40.
12. Claus, Peter J.; Sarah Diamond, Margaret Ann Mills (2003). South Asian Folklore: An Encyclopedia. Taylor and Francis. p. 619.
13.Prabhakar, P. K., Prasad, R., Ali, S., & Doble, M. (2013). Synergistic interaction of ferulic acid with commercial hypoglycemic drugs in streptozotocin induced diabetic rats. Phytomedicine, 20(6), 488-494.
14. Badhe N, Shirode L, Lale S (2015) Formulation and Evaluation of Herbal Hair Tonic. Res J Top Cosmet Sci 6: 86-90.
15. Ponnusam Y, Louis T, Madhavachandran V, Kumar S, Thoprani N, et al. (2015) Antioxidant Activity of The Ancient Herb, Holy Basil in CCl4-Induced Liver Injury in Rats. Ayurvedic 2: 34-38.
16. Lahon K, Das S (2011) Hepatoprotective activity of Ocimum sanctumalcoholic leaf extract against paracetamol-induced liver damage in Albino rats. Pharmacognosy Res 3: 13.
17. Direkbusarakom S, Herunsalee A, Yoshimizu M, Ezura Y (1996) Antiviral Activity of Several Thai Traditional Herb Extracts against Fish Pathogenic Viruses. Fish Pathol 31: 209-213.
18. Kumar V., Andola H.C., Lohani H. and Chauhan N. (2011). Pharmacological Review on Ocimum sanctum Linnaeus: A Queen of herbs. J of Pharm Res, 4:366-368.
19. Mondal S., Bijay R. Miranda R. B., and Sushil C. M. (2009). The Science behind Sacredness of Tulsi (Ocimum sanctum LINN.). Ind J of Physiol Pharmacol. 53: 291–306.
20. Prashar R, Kumar A, Hewer A, Cole KJ, Davis W, Phillips DH. Inhibition by an extract of Ocimum sanctum of 7, 12-dimethylbenz(a)anthracene in rat hepatocytes in vitro. Cancer Lett, 1998; 128(2):155160.