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Chemical Composition and Antioxidant Property of Tulsi

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Abstract

Tulsi (Ocimum sanctum L.), holly basil, is indigenous to the Indian mainland and profoundly respected for its restorative uses inside the Ayurvedic and Siddha clinical frameworks. Numerous in vitro, creature and human investigations bear witness to tulsi having different restorative activities including adaptogenic, antimicrobial, calming, cardioprotective, and immunomodulatory impacts, yet to date there are no precise surveys of human research on tulsi's clinical adequacy and security. We directed a complete writing audit of human examinations that gave an account of a clinical result after ingestion of tulsi. We scanned for examines distributed in books, theories, meeting procedures, and electronic databases including Cochrane Library, Google Scholar, Embase, Medline, PubMed, Science Direct, and Indian Medical databases. An aggregate of 24 examinations were distinguished that announced restorative consequences for metabolic disarranges, cardiovascular malady, resistance, and neurocognition. All investigations detailed ideal clinical results without any examinations revealing any noteworthy antagonistic occasions. The explored examinations strengthen customary uses and propose tulsi is a viable treatment for way of life related constant maladies including diabetes, metabolic condition, and mental pressure. Further examinations are required to investigate instruments of activity, explain the dose and portion structure, and decide the populaces well on the way to profit by tulsi's helpful impacts.

Cultivation of tulsi plants has both spiritual and practical significance that connects the grower to the creative powers of nature, and organic cultivation offers solutions for food security, rural poverty, hunger, environmental degradation and climate change. The use of tulsi in daily rituals is a testament to Ayurvedic wisdom and provides an example of ancient knowledge offering solutions to modern problems.

Keywords- Adaptogen, Ayurveda, holy basil, lifestyle, Ocimum sanctum, stress, tulsi

Introduction

Plants are potent biochemists and have been components of phytomedicine since times immemorial; man is able to obtain from them a wondrous assortment of industrial chemicals. A rich heritage of knowledge on preventive and curative medicines was available in ancient scholastic work included in the Atharvaveda (an Indian religious book), Ayurveda (Indian traditional system of medicine) and so on. An estimate suggests that about 13000 plant species worldwide are known to have been used as drugs. Plant-based natural constituents can be derived from any part of the plant like bark, leaves, flowers, roots, fruits, seeds and so on,[1] that is any part of the plant may contain active components.

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The beneficial medicinal effects of plant materials typically result from the combinations of secondary products present in the plant. The medicinal actions of plants are unique to particular plant species or groups are consistent with this concept as the combination of secondary products in a particular plant is taxonomically distinct.[2] The systematic screening of plant species with the purpose of discovering new bioactive compounds is a routine activity in many laboratories. The research on the medicinal plants should be extended with the identification of the active principles in the plants. Scientific examination of the remedies could lead to standardization and quality control of the products to ensure their safety. It is after such evaluation that they can be approved for use in the primary health care. Such research activities could also lead to the development of new drugs as in the past. Conventional antiasthmatic compounds such as sodium cromolyn and sodium cromoglycate are some of the examples of the lead prepared from the analogs of the naturally occurring furanochromone khelline[3] (Visammin). Exploration of the chemical constituents of the plants and pharmacological screening will thus provide us the basis for developing new life-saving drugs.

Types of Tulsi:

There are three different types of tulsi or holy basil namely.

1. Rama Tulsi:

Rama Tulsi is also called green leaf tulsi and this is a different type of tulsi breed that has light purple flowers and has a clove-like scent to it. It consists of eugenol which is usually found in cloves and has a mellow flavour.

2. Krishna Tulsi:

This type of Tulsi is also called purple leaf tulsi and has a clove-like aroma. It tastes like pepper in your mouth. This type of tulsi helps cure infections such as throat infections, respiratory problems, earaches and skin diseases. The oil from Krishna Tulsi is used as ear drops. It is also used to cure malaria, indigestion, insomnia and cholera.

3. Vana Tulsi:

Vana Tulsi is a native to India, Sri Lanka, and Northeastern parts of Africa. This type of tulsi is usually grown for medicinal purposes and it is imbibed into Indian religious beliefs. This type must be protected from freezing and will grow in conditions that have full sun and dry areas. It has light green leaves that are accompanied by a lemony aroma and flavour. Vana Tulsi leaves increases immunity and this is usually used for preparing tea. When consumed in the form of tea, it provides health benefits such as increased physical and mental endurance and adds more oxygen and nutrients to your bloodstream.

Tulsi has been used for thousands of years in Ayurveda for its diverse healing properties- *(4)*

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- **Healing Power:** The Basil or Tulsi plant has many medicinal properties. The leaves strengthen the stomach and help in respiratory diseases.

- **Kidney Stone:** Basil has strengthening effect on the kidney. In case of stone, regularly taking a mixture of basil leaves juice and honey for 6 months helps expel the stones via the urinary tract.

- **Stress:** Basil leaves are regarded as anti-stress agents. Recent studies have shown that the leaves afford significant protection against stress. Even healthy persons can chew 12 leaves of basil, twice a day, to prevent stress. It purifies blood and helps prevent several common elements.

- **Headaches:** Basil makes a good medicine for headache.

- **Aids in digestion:** It work as appetizer and promotes digestion by helping in secretion of digestive enzymes.

- **For curing diabetes:** Keep tulsi root powder in water overnight and take it early morning. The medicinal property of the plant helps maintain insulin level in the body and is a natural cure for diabetes.

Nutrition Value

Contains vitamin C and A, and minerals like[5] calcium, zinc and iron, as well as chlorophyll and many other phytonutrients. Also enhances the efficient digestion, absorption and use of nutrients from food and other herbs. Protein: 30 Kcal, 4.2 g; Fat: 0.5 g; Carbohydrate 2.3 g; Calcium: 25 mg; Phosphorus 287 mg; Iron: 15.1 mg and Edible portion 25 mg vitamin C per 100 g.

Phytochemical Constituents

The chemical composition of Tulsi is highly complex, containing many nutrients and other biologically active compounds, the proportions of which may vary considerably between strains and even among plants within the same field.

The nutritional and pharmacological properties of the whole herb in its natural form, as it has been traditionally used, result from synergistic interactions of many different active phytochemicals. Consequently, the overall effects of Tulsi cannot be fully duplicated with isolated compounds or extracts. Because of its inherent botanical and biochemical complexity, Tulsi standardization has, so far, eluded modern science(6)

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The leaf volatile oil[7] contains eugenol (1-hydroxy-2-methoxy-4-allylbenzene [Figure 1]), euginal (also called eugenic acid), urosolic acid[8] (2,3,4,5,6,6a,7,8,8a,,10,11,12,13,14b-tetradecahydro-1H-picene-4a-carboxylic acid [Figure 2]), carvacrol (5-isopropyl-2-methylphenol [Figure 3]), linalool (3,7-dimethylocta-1,6-dien-3-ol [Figure 4]), limatrol, caryophyllene (4,11,11-trimethyl-8-methylene-bicyclo[7.2.0]undec-4-ene [Figure 5]), methyl carvicol (also called Estragol: 1-allyl-4-methoxybenzene [Figure 6]) while the seed volatile oil have fatty acids and sitosterol; in addition, the seed mucilage contains some levels of sugars and the anthocyans are present in green leaves. The sugars are composed of xylose and polysaccharides.

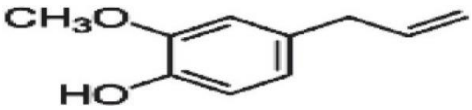

Fig1 Eugenol (1-hydroxy-2-methoxy-4-allylbenzene)

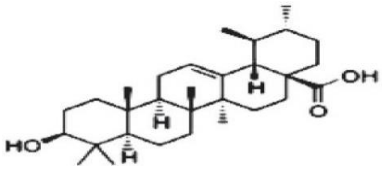

Fig2 Urosolic acid (2,3,4,5,6,6a,7,8,8a,10,11,12,13,14btetradecahydro-1H-picene-4a-carboxylic acid

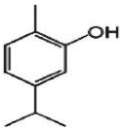

Fig3 Carvacrol (5-isopropyl-2-methylphenol)

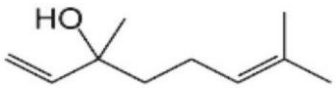

Fig4 Linalool (3,7-dimethylocta-1,6-dien-3-ol)

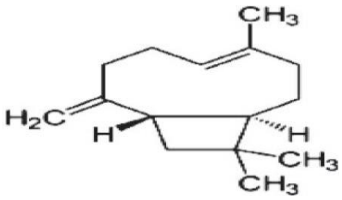

Fig5 Caryophylline-(4,11,11-trimethyl-8-methylene-bicyclo[7.2.0]undec-4-ene)

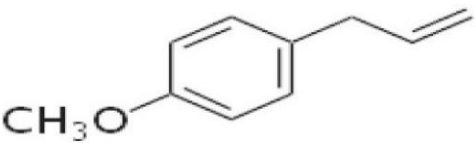

Fig6 Estragol (1-allyl-4-methoxybenzene)

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Conclusion

It is evident that Tulsi is a medicinal plant of great importance because of its varied application in medicine, and hence can be corroboratively called the "Queen of Herbs." Modern day scientific research into tulsi demonstrates the many psychological and physiological benefits from consuming tulsi and provides a testament to the wisdom inherent in Hinduism and Ayurveda, which celebrates tulsi as a plant that can be worshipped, ingested, made into tea and used for medicinal and spiritual purposes within daily life. In providing a focus for ethical, sustainable and ecological farming practices that provides a livelihood for thousands of farmers, the cultivation of tulsi goes beyond providing benefits for individuals and households and begins to address broader social, economic and environmental issues.

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