



Study the qualitative Phytochemical analysis of Ocimum sanctum (Tulsi)

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ABSTRACT :

Ocimum sanctum, commonly known as Tulsi, holds both sacred and medicinal value in Indian tradition and across developing nations. Recognized for its fragrant leaves and therapeutic benefits, Tulsi has been widely studied for its phytochemical components. This research aims to identify various bioactive compounds in Tulsi leaves. The study confirmed the presence of secondary metabolites such as carbohydrates, tannins, flavonoids, saponins, glycosides, terpenoids, fatty acids, and phenolic compounds through qualitative analysis.

Keywords: Laboratory apparatus, qualitative phytochemical screening, secondary metabolites, plant extracts, methanol extract, ethanol extract, herbal medicine

Introduction

Belonging to the Lamiaceae family, *Ocimum sanctum*, or Tulsi, is revered as the "Queen of Herbs" for its wide-ranging medicinal properties. It exists in two main forms: Green (Ram Tulsi) and Purple (Krishna Tulsi), both of which offer similar health benefits. Tulsi may influence the neurotransmitter acetylcholine, contributing to memory retention and sleep regulation, particularly REM sleep.



Fig: *Ocimum sanctum* (Tulsi) medicinal plants

Chaudhary et al. (2020): LC-MS analysis of *O. sanctum* leaf extracts revealed high levels of flavonoids like luteolin, apigenin, and phenolic compounds such as rosmarinic, chlorogenic, and caffeic acids.

Srivastava et al. (2021): GC-MS analysis showed compounds such as eugenol, phytol, and terpenoids, known for their therapeutic significance.

Surbhi B. (2023): Standard phytochemical tests confirmed the presence of alkaloids, flavonoids, tannins, saponins, phenols, terpenoids, and essential oils.

Therapeutic Applications of Tulsi

1. Tulsi tea with honey is beneficial for fevers and acts as an expectorant.
2. Effective in managing asthma and respiratory issues.
3. Used for conditions like bronchitis and tuberculosis.
4. Leaf juice aids in relieving catarrh in children.
5. Chewing leaves helps combat cold and flu symptoms.

Aim and Objective

To conduct a qualitative phytochemical investigation of *Ocimum sanctum* to detect bioactive constituents such as proteins, carbohydrates, flavonoids, tannins, saponins, glycosides, and phenols.

Materials and Methods

Plant Collection:

Leaves of *Ocimum sanctum* were harvested from Ashok Nagar, Bilaspur, cleaned with sterile water, and air-dried. The dried leaves were ground into powder using a mechanical grinder.

Extraction Process:

50g of powdered Tulsi leaves were subjected to extraction using distilled water, methanol, and ethanol in a Soxhlet apparatus. The resulting extracts were concentrated with a rotary evaporator and dried in a water bath.

Phytochemical Methods:

Protein Test (Ninhydrin): Violet coloration indicated protein presence.

Carbohydrate Test (Molisch's): A violet ring formation confirmed carbohydrates.

Phenol Test: Addition of ferric chloride produced a green-blue color.

Tannin Test: A dark color developed after ferric chloride addition.

Terpenoid Test: Chloroform and sulfuric acid treatment gave a grey interface indicating terpenoids.

Results and Discussion

Table 1 :- Amount of plant extracts yield percentage in different solvents.

Extract	Yield amount (%) W/W
Aqueous	5%
Methanol	8%
Ethanol	7%

Extraction Yield

Organic solvents yielded more extract compared to aqueous solvents.

Phytochemical Results:

Table 2: Qualitative Phytochemical screening methanol extract of tulsi leaf

Phytochemical	Methanol	Ethanol
	Extract	Extract
Protein	Absent	Absent
Carbohydrates	Present	Present
Phenol	Present	Absent

Tannin	Present	Present
Terpenoids	Present	Present

Tulsi contains a variety of health-promoting compounds. Notably, eugenol and other bioactive agents present in *O. sanctum* are responsible for its pharmacological activities including antimicrobial, anti-inflammatory, and antioxidant effects. The plant's natural defenses also serve as antimicrobial agents.

The study confirms that *Ocimum sanctum* contains multiple secondary metabolites contributing to its medicinal potential. Its phenolic and antimicrobial components support its use in traditional medicine and reinforce its title as "The Elixir of Life."

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