

**PHYTOCHEMICAL SCREENING AND CYTOTOXIC EFFECTS OF OCIMUM  
SANCTUM AND MENTHA PIPERITA EXTRACTS****Dr. Rajeev Ramachandra Kolgi\*<sup>1</sup>, Aravinda T. S.<sup>2</sup>, Gayithri V.<sup>3</sup>, Shilpashree S.<sup>4</sup>, Likhitha K. V.<sup>5</sup>, Bindu C. A.<sup>6</sup>**<sup>1</sup>Department of Chemistry and Biochemistry, Government Science College, Bengaluru, Karnataka, India.<sup>2,3,4,5,6</sup>Department of Chemistry and Biochemistry Nrupathunga University, N T Road, Bengaluru, Karnataka, India.**\*Corresponding Author: Dr. Rajeev Ramachandra Kolgi**

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**ABSTRACT**

Leaves of two plant extracts from *Ocimum sanctum* and *Mentha Piperita* are studied for their therapeutic activity. These plants have been evaluated for cytotoxic property against camptothecin. The present study was carried out for phytochemical screening of principle bioactive compounds. Phytochemical analysis revealed the presence of alkaloids, carbohydrates, aminoacids, glycosides, flavonoids, tannins, terpenes, and steroids. The plant extracts showed less cytotoxic effects. However, the methanol leaf extracts showed the presence of significant bioactive compounds.

**KEYWORDS:** Camptothecin, methanol leaf extracts, steroids, bioactive compounds.**INTRODUCTION**

Lamiaceae, formerly called Labiatae, the mint family of flowering plants, with 236 genera and more than 7,000 species, the largest family of the order Lamiales. Lamiaceae is distributed nearly worldwide, and many species are cultivated for their fragrant leaves and attractive flowers. The family is particularly important to humans for herb plants useful for flavour, fragrance, or medicinal properties.

The alternative family name Labiatae refers to the flowers typically having petals fused into an upper lip and a lower lip (labia in Latin). The flowers are bilaterally symmetrical with five united petals and five united sepals. They are usually bisexual and verticillate (a flower cluster that looks like a whorl of flowers, but actually consists of two crowded clusters). Although this is still considered an acceptable alternative name, most botanists now use the name Lamiaceae in referring to this family. The leaves emerge oppositely, each pair at right angles to the previous one (decussate) or whorled. The stems are frequently square in cross section, but this is not found in all members of the family, and is sometimes found in other plant families.

*Ocimum sanctum* (Holy basil), called tulsi in India, is ubiquitous in Hindu tradition. Perhaps its role as a healing herb was instrumental in its sacred implication. *O. sanctum* (tulsi) is perhaps the most common and most revered of all household plants in India. Tulsi is an erect sweet-scented pubescent herb, 30-100 cm in height its leaves, seeds and whole plant is useful.

*Mentha piperita* is a perennial herb with very fragrant, toothed leaves and tiny purple, pink, or white flowers. There are many varieties of mint—all fragrant, whether shiny or fuzzy, smooth or crinkled, bright green or variegated. However, you can always tell a member of the mint family by its square stem. Rolling it between fingers, we can notice a pungent scent and think of candy, sweet teas, or maybe even mint juleps. As well as kitchen companions, mints are used as garden accents, ground covers, air fresheners, and herbal medicines.<sup>[1]</sup>

**Figure 1: *Mentha piperita*.****Figure 2: *Ocimum sanctum*.**

## MATERIALS AND METHODS

### Collection and Identification of Plant

The plants were collected from the different region of Doddaballapur taluk, Bengaluru Rural district, Karnataka, India (from their natural habitat with acceptable bio-conservation methods) has been identified and authenticated by Botany Department, Nrupathunga University Bengaluru.

**Plant Material** The leaves of *Mentha piperita* and *Ocimum sanctum* were washed thoroughly under running tap water followed by distilled water and then air dried under shade at room temperature for one week. The dried leaves were powdered with the help of porcelain mortar and pestle to increase the surface area for absorption of

the solvents (Harborne 1973), stored in separate containers in moisture free environment and used for further analysis.

**Preparation of Extract** 30 gm of dried leaves powder of each plant were taken separately and process of extraction using Soxhlet apparatus was performed out in a 250 mL of methanol separately. The extraction process was time framed for complete 48 hrs after which the solvent mixture was concentrated at a temperature not exceeding 40C using a rotary evaporator and stored at 40C. The leaves extracts of *Mentha piperita* and *Ocimum sanctum* were subjected to phytochemical examinations as per the standard methods adopted as per Brain and Turner (1975) and Evans (1996).

**Table 1: Phytochemical testing of extract (Methanol).**

Sl. No	Phytochemicals tests	<i>Mentha piperita</i>	<i>Ocimum sanctum</i>
1	Salkowski test	–	+
2	Liebermann-Burchard test	–	–
3	Mayer's test	+	+
4	Wagner's test	+	+
5	Gelatin test	–	–
6	Lead acetate test	+	+
7	Alkaline reagent test	+	+
8	Keller killiani test	+	+
9	Sodium hydroxide test	+	+
10	Molisch's test	+	+
11	Fehling's test	+	+
12	Conc.H <sub>2</sub> SO <sub>4</sub> test	+	+
13	Ninhydrin test	+	+

(+) = presence & (-) = absence

*Mentha piperita* leaves extract revealed the presence of alkaloids, carbohydrates, aminoacids, glycosides, flavonoids, tannins, and steroids and *Ocimum sanctum* leaves extract showed the presence of alkaloids, carbohydrates, aminoacids, glycosides, flavonoids, tannins, terpenes, and steroids.

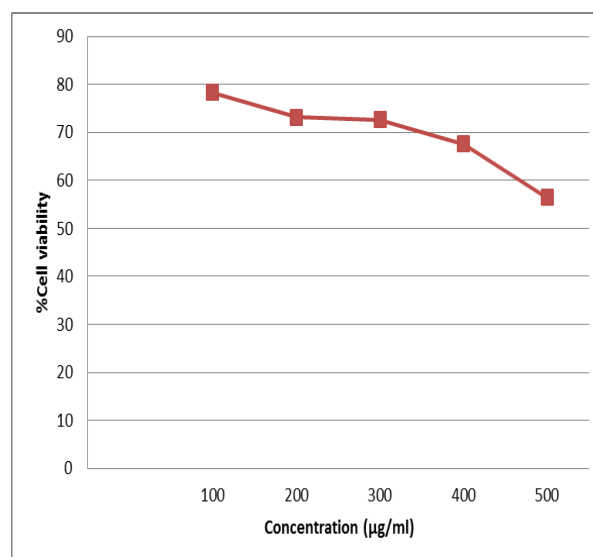
### Cytotoxicity evaluation using MTT assay

Cytotoxicity evaluation performed using MTT assay as described by Mossman. (MCF-7) in their exponential growth phase were seeded in a flat-bottomed 96-well polystyrene coated plate and were incubated for 24 hrs at 37°C in a 5% CO<sub>2</sub> incubator. Series of dilution (100, 200, 300, 400, and 500 µg/mL) was added to the plate. After 24 hours of incubation, 10 µl of MTT reagent was added to each well and was further incubated for 4 hours. Formazan crystals formed after 4 hours in each well were dissolved in 150 µL of detergent and the plates were read immediately in a microplate reader (BIO-RAD microplate reader-550) at 570 nm. Wells with complete medium, and MTT reagent, without cells were used as blanks.<sup>[2]</sup>

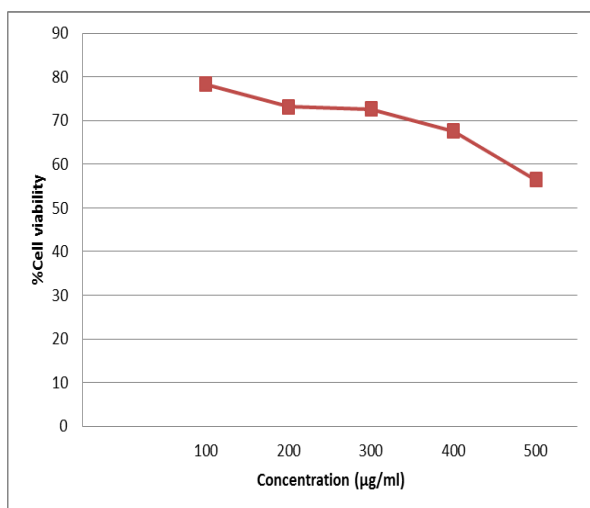
### Anticancer activity (Results)

The cytotoxicity assay was performed according to the microculture MTT method with slight modifications. Tulsi showed 60.28% cell viability at 500 µg/ml,

whereas mint extract showed 56.46% cell viability at same concentration compared to standard camptothecin showed 54.09% cell viability at 13.92 µg/ml, The effects of plant extracts on cancer cells is represented graphically (Graph 1 & 2).



**Graph 1: MTT assay conducted on Mint extract.**



**Graph 2: MTT assay conducted on Tulsi extract.**

### CONCLUSION

Herbal medicine refers to use of plant seeds, roots, berries, leaves, bark and flowers for medicinal purposes. Recently, the World Health Organization estimated that 80 % of people worldwide rely on herbal medicines for some part of their primary health care. Herbal medicines have been the oldest forms of health care. In this study *Mentha piperita* (Mint) and *Ocimum sanctum* (Tulsi) plant extracts have been investigated for phytochemical analysis and cytotoxic properties. The plant extracts showed low cytotoxic effects. However, the methanol leaf extracts showed the presence of significant bioactive compounds. In-vivo studies are essential and auxiliary to open new horizons in the pharmaceutical industry for the use of Mint and Tulsi extracts to design drugs with therapeutic applications.

**Conflict of Interest** Authors declare no conflicts of interest.

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