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## **Antibacterial Effect of *Ocimum sanctum* Linn. (Tulsi)**

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**ABSTRACT** - The medicinal plants are widely used by the traditional medical practitioners for curing various diseases in their day to day. In traditional system of medicine, different parts (leaves, stem, flower, root, seed and even whole plant) of *Ocimum sanctum* Linn. (known as tulsi) were used. Eugenol is the active constituent present in *ocimum sanctum* L.. *Ocimum sanctum* is effective against *E.coli*, *Salmonella typhi*, *Pseudomonas pyocyaneus* and *Vibro cholerae* with in specified contact time. It is responsible for the therapeutic potential of tulsi. It is found that *Ocimum sanctum* L. possess antifertility, anticancer, antifungal, antimicrobial, hepatoprotective, cardio protective, antimicrobial, anti spasmodic, analgesic and diaphoretic action. It is effective against *E.coli* and shows increase in antibacterial activity with in increase in concentration and specific contact time. After 30 minutes contact time, herb *Ocimum sanctum* shown better antibacterial activity against *Ocimum sanctum*. Herb *Ocimum sanctum* showed no variation in antibacterial activity after 30 minutes, 1 hr. and 2 hours contact time against *E.coli*. Specific antibacterial activity of *Ocimum sanctum* against known bacteria under in-vitro condition is observed i.e. Minimum Inhibitory Concentration (MIC) for *E.coli*, *Salmonella typhi* and *Vibro cholerae* is 2mg/ml.

*Key words: Ocimum sanctu; antibacterial effect; Minimum Inhibitory Concentratio; therapeutic potential*

### **I. INTRODUCTION**

Plants are one of the most important sources of medicines. The *Ocimum santcum* is a herbal plant having antimicrobial activity against many of the microorganism and also has the anticancer, antidiabetic (Mediratte et. al., 2000), anticancer effects and antibiotic protection (Singh, 1998). Tulsi, Queen of herbs, The Legendary “incomparable one” of India is one of the holiest and most cherished of the many healing and health giving herbs of the orient (Rastogi and Mehrotra 1995). Tulsi is an erect sweet, scented pubescent herb, 30-100cm height (Pavithra et.al.,2012). Tulsi is often enjoyed as a simple herbal tea and is frequently blended with other herbs and spices for various medicinal and culinary purposes. A variety of biologically active compounds such as ursolic acid, apigenin and luteolin have been isolated from the leaves. Phytochemical compounds in leaf include eugenol (volatile oil), ursolic acid (triterpenoid) and rosmarinic acid (phenylpropanoid) other active compounds includes caryphyllene and oleanolic acid. Seeds contain linoleic acid and linolenic acid. Nutritional components include vitamin A and C, minerals

calcium, iron and zinc as well as chlorophyll. Tannins, alkaloids, glycosides and saponins are abundant in Tulsi. The Tulsi plant is even known to purify or de-pollute the atmosphere and also works as a repellent to mosquitoes, flies and other harmful insects. The major effects of tulsi leaves are anti fertility effect (Singh et al., 1991), anti diabetic effect, anti allergic and immuno modulator effects (Mediratte P.K. et al., 1987), stress resilience (Bhargava et al., 1981 & Saksena et al., 1987), anti- ageing effects (Rastogi et al., 1995), anti oxidant activity (Pushpangadan G. et al., 1977), immunity tune-up (Mediratta et al., 2000), anti-inflammatory action (Singh, S. 1998), antibiotic protection (Singh, S. 2002), lung and bronchial support, nutrition, allopathic medicine complement, antimicrobial properties (Mehta et al., 1979). A variety of biologically active compounds such as urosolic acid, apigenin and Luteolin have been isolated from the leaves. *Ocimum sanctum* is effective against *E.coli* and shows increase in antibacterial activity with increase in concentration and specified contact time (Sadul et al., 2009) Its effect against *E.coli* and shows increase in antibacterial activity with in increase in concentration and specific contact time.

## II. MATERIAL & METHODS

Plant material have been collected and shade dried plant material have been powdered mechanically and then stored at room temperature. Herb powders were extracted in 50 gm lots by there cold percolation with 50ml of pure ethanol. Extracts were dried in incubator at 37°C for 24 to 36 hrs. This treatment gave rise to any powder or paste of extracts and extracts were dissolved in pure ethanol.

**Control Testing:** - Control testing of different herbs for selected bacteria is done with 10% concentration of ethanol for determination of Minimum Inhibitory Concentration (MIC) (Sadgir et al., 2010)

### III. Methods for determination of MIC of *O. Sanctum*

The standard strain was maintained one culture plate of nutrient agar, subculture being done weekly. To optimize the contact period, time dependent removal of *E.coli* was carried out for 30 minute, 1 hr, 2 hrs and 5 hours

## IV. RESULT AND DISCUSSION

All the selected bacteria; *E-coli*, *Salmonella typhi* and *Vibrio cholerae*, shown microbial growth in 15% concentration ethanol. Specific antibacterial activity observed for herb *O. sanctum* that MIC for *E-coli*, *Salmonella typhi* and *Vibrio cholerae* is 20mg/ml variation of contact time for specific antibacterial activity of *O. Sanctum* against *E.coli* under in-vitro condition is summarized in Table 1. It is observed for herb *O. Sanctum* that Minimum Inhibitory Concentration (MIC) for *E.coli* after 30 minute, after 1hr ,2 hrs and hours is 2 mg/ml.

## V. CONCLUSION

After 30 minute contact time, Herbal *O. Sanctum* shown better antibacterial activity against all three bacteria's. Herbal *O. Sanctum* showed no variation in antibacterial activity after 30 minute, after 1hr ,2 hrs and 5 hours contact time against *E.coli*.

**Table 1: Specific Antibacterial Activity *O. Sanctum* against known bacterial with contact time 30 minutes under in-vitro conditions**

Tulsi ( <i>O.Sanctum</i> )	<i>E.coli</i>	<i>S. typhi</i>	<i>V. cholerae</i>
	2mg/ml	2mg/ml	2mg/ml

**Table 2 Control testing of survival of microbial growth (10% concentration of ethanol)**

S.N.	Local Name	Botanical Name	<i>E.coli</i>	<i>S. typhi</i>	<i>V. cholerae</i>
1	Tulsi	<i>O.Sanctum</i>	Growth observed	Growth observed	Growth observed

**Table 3 Variation of contact time for specific antibacterial activity of *O.Sanctum* against *E.coli* under in-vitro condition**

			Minimum Inhibitory Concentration (MIC)			
S.N.	Local Name	Botanical Name	After 30 minutes	After 1 hour	After 2 hours	After 5 hours
1	Tulsi	<i>O.Sanctum</i>	2	2	2	2

**Table 4: Interrelation between bacteria and disease**

<b>Bacteria</b>	<b>Major Disease</b>
<i>E.coli</i>	Gastroenteritis, urinary tract infection Septicemia, pyogenic infection
<i>S. typhi</i>	Typhoid fever
<i>V. cholerae</i>	Cholera

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