J. Phytol. Res. **23**(1) : 149-150, 2010

ANTIBACTERIAL ACTIVITY OF *OSCIMUM SANCTUM* LEAF EXTRACTS

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In vitro antibacterial effect of different concentrations of ethanolic and aqueous leaf extract of *Oscimum sanctum* against the Gram negative *Pseudomonas aeruginosa, Escherichia coli* and Gram positive *Staphyloccous aureus* bacteria was evaluated. Both extracts inhibited the growth of all test organisms. *P. aeruginosa* was inhibited more while *S. aureus* and *E. coli* less as compared with growth of respective organisms seen in positive control plates. Ethanolic extract showed comparatively more inhibitory effect than aqueous extract. The results may be of significance in isolation and characterization of new potential antibacterial compounds in plants.

Keywords : Antibacterial; Aqueous extract; Ethanolic extract; Growth inhibition; *Oscimum sanctum.*

Plants have provided a source for novel drug compounds, which may either become the base for the development of a medicine or be used for the treatment of disease[1]. Plants are rich in biologically active compounds[2] which have great potential to act against multi drug resistant bacteria[3,4]. The phytochemicals such as Tannins, Alkaloids, Glycosides, Saponins, Flavonoids, Steroids present in plants[5] may have broad-spectrum antibiotic qualities[4]. The antibiotic properties in higher plants have enormous therapeutic potential [3-6]. Currently interest has developed in screening the plants for antimicrobial compounds and a number of plants have been evaluated for the antibacterial activities[7-12]. Leaf extracts exhibit better antibacterial efficacy than stem, root and flower[13].

In the present investigation, the effect of etahnolic as well as aqueous leaf extract of *Oscimum sanctum* on the growth of Gram negative *Pseudomonas aeruginosa, Escherichia coli* and Gram positive *Staphyloccous aureus* bacteria was evaluated *in vitro* by agar well diffusion method. Vijaya and Mani[14] detected the antibacterial effect in *O. americanum* plant extract.

Fresh leaves of *Oscimum sanctum* were collected, washed in tap water and then in sterile distilled water and kept for drying in shade. The dried leaves were then ground into fine powder. 10g of the powder was soaked in 100 ml methanol and distilled water for a day and then extracted using soxhlet apparatus. The extract was centrifuged at 5000 rpm and the supernatant collected was kept in oven at 37°C for the complete evaporation of solvent.The residue, thus obtained, was mixed in appropriate amount of DMSO (Dimethyl Sulphoxide) so as to get the concentration of 1g / 2ml which served as the stock from which 25, 50, 75, 100 and 125 µl were used for determining the effect on the test organisms. A loopful of 24 hrs old test organisms was suspended in 30 ml sterile nutrient broth, shaken thoroughly to obtain uniform suspension and kept for activation.

The antibacterial activity of the plant extract was determined following the agar well diffusion method [15]. 0.2 ml of inoculum suspension containing 10^8 cells / ml was inoculated in the molten Mueller-Hinton agar medium and kept on a rotary shaker. After proper homogenization, the medium was poured in sterile Petri plates and allowed to solidify. Then, with a sterile cork borer five wells of 6 mm diameter were made in the agar medium in each petriplate. The wells were filled with 25, 50, 75, 100 and 125 µl of the extract stock for determining the bioassay. The test plates were incubated at 37°C. Positive as well as negative control sets with tetracycline and double distilled water in the wells, respectively, were kept for each bacterial strain. All the plates were replicated thrice. After 24 hours the diameter of zone of inhibition was measured.

A perusal of the Table 1 reveals that the growth of all the three organisms tested were found to be inhibited by the leaf extract. The ethanolic extract exhibited more inhibitory effect than the aqueous extract as compared to positive control, as reported by earlier workers[4, 11, 13, 14]. The bacteria did not show any growth inhibition signs in negative control plates.

P. aeruginosa was observed to be more sensitive as it showed maximum zone of inhibition followed by *E.coli* and *S.aureus*. Ayandele and Adebiyi[5] found more zone of inhibition in *S. aureus* and less in *P. aeruginosa*. Gislene *et al.*[8] reported no inhibition effect of plant extracts on *E. coli* which indicate the specific sensitivity of bacteria to different plants extract. Further investigations in isolation and characterization of antimicrobial

Table 1. Antimicrobial activity of *O.sanctum* leaf extract. *Diameter of zone of inhibition (mm).

S.No.	Organism→	*S .aureus*			*E. coli*			*P. aeruginosa*		
	Extract concentration (0.5mg / µl) ↓	Experimental		Positive control	Experimental		Positive control	Experimental		Positive control
		A	B		A	B		A	B	
1	25 µl	7.00 ± 0.26	5.20 ± 0.42	6. 20 ± 0.42	8.90 ± 0.53	7.10 ± 0.31	7.10 ± 0.31	9.90 ± 0.43	7. 90 ± 0.33	7.90 ± 0.33
2	50 µl	8.20 ± 0.26	6.00 ± 0.60	7.00 ± 0.60	9.80 ± 0.23	7. 00 ± 0.38	8.00 ± 0.38	10.00 ± 0.43	7. 35 ± 0.22	8.35 ± 0.22
3	75 µl	9.00 ± 0.33	7. 30 ± 0.03	8.30 ± 0.03	11.20 ± 0.25	8. 20 ± 0.03	9.20 ± 0.03	12.20 ± 0.15	8. 20 ± 0.85	9.20 ± 0.85
4	100 µl	10.20 ± 0.33	8. 20 ±0.23	9.20 ± 0.23	12.80 ± 0.29	9. 10 ± 0.90	10.10 ± 0.90	13.80 ± 0.29	9. 80 ± 0.29	10.80 ± 0.29
5	125 µl	11.28 ± 0.25	9. 00 ±0.20	10.00 ± 0.20	13.40 ± 0.33	10. 12 ± 0.21	11.12 ± 0.21	14.80 ± 0.23	10. 80 ± 0.43	11.80 ± 0.43

* Mean of three replicates ± SD. A = Ethanolic extract B = Aqueous extract

compounds from plants can be of great significance in developing alternative and safe drugs against multi drug resistant bacterial pathogens.

Acknowledgements

The authors are thankful to the Heads of concerned institutions for providing laboratory and library facilities.

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