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ANTIBACTERIAL SCREENING OF EXTRACT OF THE LEAVES OF *Lantana camara*

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ABSTRACT

Different extracts (based on the polarity) of *Lantana camara* were tested against local clinical isolates of bacterial strains using disc diffusion method. All the extracts prepared from the leaves of *Lantana camara* have been found to inhibit the growth of bacterial strains. Ethanolic extracts of the leaves were moderately active while the other extracts of leaves exhibited little. The good experimental results obtained justify the folk use of this plant species as a bactericidal.

KEYWORDS: *Lantana camara* ,ethanolic extracts, antibacterial screening

Lantana camara Linn. family Verbenaceae, commonly known as wild sage, is a flowering shrub native of tropical America and is cultivated through out the world as an ornamental (Sharma and Sharma, 1989). Different parts of the plant are used in folklore remedies and traditional systems of medicine for the treatment of various human ailments. Over the last twenty-five years a large number of plant species have been evaluated for their antibacterial activity. One of the plants known for having many medicinal uses in traditional system of medicine is *Lantana camara* (Juliana et al., 2002). The leaves are used in the treatment of itches, cuts, ulcers, swellings, bilious fever, eczema and rheumatism. *Lantana camara* has received attention due to its role in economy and ecology. It is serious weed in several countries that causes toxicity in grazing animals and is rapidly disturbing the ecological balance due to its luxuriant growth (Sharma et al., 1988). Many pharmacological investigations indicated that extracts of the leaves of *Lantana camara* exhibit antibacterial properties. In the light of the medicinal properties attributed to *Lantana camara*, the present studies were to evaluate the antibacterial screening of several extracts of the leaves of *Lantana camara* against the local clinical isolated bacterial strains.

MATERIALS AND METHODS

Plant Material

Fresh leaves of *Lantana camara* were collected in February 2012, near the bank of river Betwa, Vidisha (M. P., India). Voucher specimen of the plant was deposited in the herbarium of Department of Botany, St. Mary's P. G. College, Vidisha, M. P., India.

Preparation of Extracts

The leaves of the plants were air dried at room temperature before grinding them to powdered form with the help of mechanical grinder. Several solvents of different polarity i. e. Benzene, Hexane, Petroleum ether (40 - 60 ºC), Chloroform, Ethanol and Ethyl acetate were used respectively to get extracts of the previously dried and powered leaves. The powdered leaves were extracted by soxhlet apparatus (Harborne, 1984). Each extract was first filtered through Whatman No. 1 filter paper to clarify and then through a 0.45 µm membrane filter. The filtrate was evaporated under reduced pressure in vacuum evaporator. The dried crude extracts were sterilized overnight by UV radiation and then stored at room temperature in amber color glass vials until used for antibacterial testing.

Preparation of Concentrations

In the study of the antibacterial activity, all the extracts were diluted in dimethylsulfoxide (DMSO). The concentrations corresponding to the extracts given in Table1 are expressed in terms of mg / ml.

Test Bacterial Strains

The following bacterial strains were used as test organisms: *Staphylococcus aureus, Salmonella typhi, Pseudomonas aeruginosa, Klebsiella pneumoniae* and

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Escherichia coli. All the bacterial strains were obtained from Department of Microbiology, Gandhi Medical College, Bhopal, M. P., India.

Screening of Extracts for Antibacterial Activity

The antibacterial effects were tested by the disc diffusion method (Bauer et al., 1966). Firstly the bacteria to be tested were inoculated into Mueller Hinton broth (HiMedia) and incubated for 3- 6 hours at 35 ºC. Petri dishes containing Mueller Hinton Agar (HiMedia) were impregnated with these bacterial suspensions.Discs of 6 mm diameter (Sterile blank, HiMedia) were impregnated with different concentration of each extracts. Blank disc impregnated with DMSO was used as negative control and disc of chloramphenicol (10 µg / disc, HiMedia) as positive control. All test plates were incubated at 37 ºC for 24 hour and the diameter of zones of inhibition were measured.

RESULTS

The inhibitory effects of the different extracts from *Lantana camara* on the five bacterial strains in Mueller Hinton agar are shown in Table 1. Inhibition zones were measured in mm at 24 hour after incubation. Chloramphenicol and DMSO were used as appropriate controls. The results indicated that the most sensitive organisms were *Staphylococcus aureus, Pseudomonas aeruginosa* and *Escherichia coli* shown in Photoplate No. 1, 2 and 3. DMSO showed no activity against any of the bacterial strains tested, while the Chloramphenicol showed the activity of all the tested strains.

DISCUSSION AND CONCLUSIONS

The antibacterial activity of the *Lantana camara* extracts varied with the solvents used for the extraction. It is suggested that the Crude preparations of the leaves of the plant containing both the active and non-active components to have higher efficacy than semi-crude or pure plant substances (Kafaru, 1994). The wide variety of activity of the ethanolic extracts over the water extracts is significant because of the leaves of plants are of traditional uses. The antibacterial activity is passively because of the presence of secondary metabolites existed in the plant. Hence, it is difficult to explain the limited spectrum of activity of other extracts compared with the ethanolic extracts since all the extracts had had the secondary metabolites (Begum et al., 1995). Although in unlike proportion provably antithesis may be resolved when the active constituents have been isolated and the activity of the purified component

Table 1: Antibacterial activity of various extracts of *Lantana camara* leaves

Extract	Conc. (mg / ml)	Diameter of zones of inhibition (mm)[a]			Extract	Conc. (mg / ml)	Diameter of zones of inhibition (mm)[a]		
		1[b]	2	3			1[b]	2	3
Benzene extract	80	10	8	7	Chloroform extract	80	15	12	13
	40	9	7	6		40	14	11	11
	20	7	5	5		20	12	9	10
	10	6	4	4		10	12	8	9
Hexane extract	80	12	8	8	Ethanolic extract	80	19	15	13
	40	10	7	7		40	17	13	12
	20	9	6	6		20	16	12	10
	10	8	5	5		10	14	10	8
Petroleum ether extract	80	13	9	11	Ethyl acetate extract	80	17	12	11
	40	12	8	10		40	16	11	9
	20	11	7	9		20	15	9	8
	10	10	5	8		10	13	8	7
Chloramphenicol	--[c]	29	27	30	DMSO	--[d]	--	--	--

[a] Each value is mean of three replicates.
[b] 1, *Staphylococcus aureus*; 2. *Escherichia coli*; 3. *Pseudomonas aeruginosa*
[c] Chloramphenicol (30 µg / disc)
[d] -- No zone of inhibition.

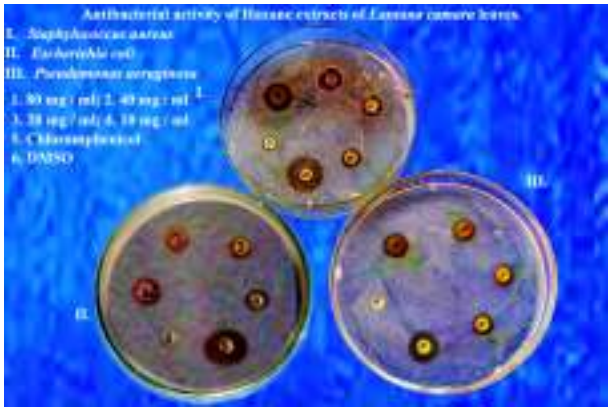
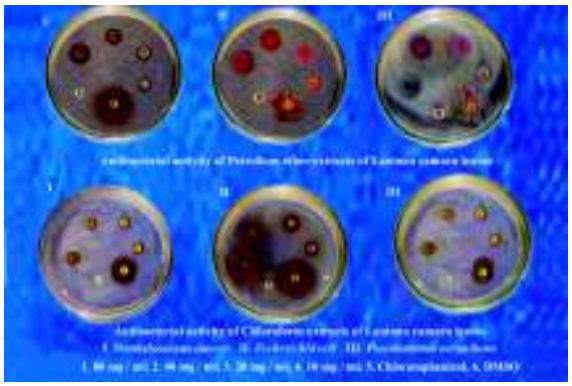


Photo Plate No. 1



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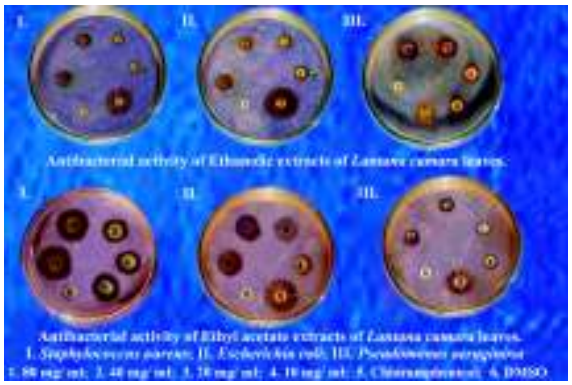

Photo Plate No. 3

determined. In that phase, the interaction between active and non-active components may expose light onto the various activities of the varied extracts.

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