

## Evaluation of Antibacterial Activity of *Cleome viscosa*

Neerja Shrivastava and Dharmendra Kumar Sharma

Microbiology Lab P.G. Department of Botany,  
Government P.G. College, Kota - 324 005, India.

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There are numerous plants which have established their reputation as antibacterial agents due to the active principles present in them. In the light of this fact present paper deals with the antibacterial activity of *Cleome viscosa* plant. Crude and acetone extracts of leave and stem of *Cleome viscosa* were evaluated against three bacterial strain *E. coli*, *B. subtilis* and *P. aeruginosa*. Crude extract of leaves and stem of *Cleome viscosa* shows antibacterial activity against all bacterial strain, while acetone extract of leaves shows antibacterial activity against *E. coli* and *B. subtilis*.

**Key words:** Antibacterial activity, *Cleome viscosa*, *E. coli*, *B. subtilis*, *Pseudomonas aeruginosa*.

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We come on this earth as guests of plants" is a monumental ancient aphorism. Association of plants and man is an age old process, starting from human civilization. Infact, from the start of life to the last breath almost every aspect of life is deeply associated with the plants. Medicinal plants played a very important role from time immemorial among the illiterates and highly civilized men and women.

The importance of natural medicines can be indicated by the fact that one of the most "Life saving drugs" (antibiotics) can only be obtained

by plants, traditional system of medicines recognize plant as a important source of chemotherapeutic agents (Racio *et al.*, 1989, Suri *et al.*, 1992). There are many plants, which are identified as a source of antimicrobial properties (Cowam, 1999, Kaushik, 2003, Kaushik and Dhiman, 2000).

India have a wealth of plants, many of the weed plants processes antimicrobial activities, which add to the utility of these plants. In the light of this fact present investigation was undertaken, so that it can trigger the search for some novel plant based antimicrobial substance.

Antibacterial activity of different plants were tested by various worker (Rafi *et al.*, 2005, Nanakumar *et al.*, 2006, Parekh and Sumitra 2006, Parekh, 2006, Verma, 2006, Sagottuvel *et al.*, 2007). Various investigators have initiated studies on the antibacterial activity of different plant, but there is no consensus on the antibacterial activity of *Cleome viscosa* plant.

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\* To whom all correspondence should be addressed.

## MATERIAL AND METHODS

To study the antibacterial activity of *Cleome viscosa*, plants were collected during the month of August-September from college campus. Fresh and healthy plant were collected. Plant material was washed in tap water to remove soil particles.

Pure cultures of *E. coli*, *Pseudomonas aeruginosa* and *Bacillus subtilis* were collected from microbiology lab of college, Bacterial culture were minted on nutrient agar slant at 4°C.

### Preparation of Crude/Acetone extract

For preparation of crude extract and acetone extract, 5gm of leaves and stem powder of *Cleome viscosa* plant were taken in separate test tubes, and dissolved in 5ml distilled water (crude extract) and 5ml of acetone for (acetone extract) and leaves it for 24 hrs, allow to sedimentation and extractions of active ingredients in solvent.

### Preparation of Discs

Whatman filter paper no 1 was taken and cut the disc of equal diameter (6mm) with the help of punch. After sterilization, discs were dipped in plant extract, after dipping, they were air dried, Now discs were prepared with plant extract.

### Testing procedure

The antibacterial activity was undertaken by the standard disc diffusion method.

15 ml of Nutrient Agar was prepared and autoclave. Then the medium was poured into a sterile petri-plate under ascetic conditions and allow to solidify. The bacterial culture was streaked all over the agar using sterile cotton swab.

After that the prepared plant extracts discs were kept in the petri-plate containing medium. The plates were then incubated at 37°C for 24 hours. After the zone formation the inhibition was measured using a scale in diameter.

## RESULTS AND DISCUSSION

The selected plant *Cleome viscosa* was employed to study the antibacterial activity of leaves and stem extract of plant against *E. coli*, *Pseudomonas aeruginosa* and *Bacillus subtilis*.

The result of the antibacterial activity of leaves and stem extract are shown in Table 1. Results indicate that crude extract shows high antibacterial activity against all three bacterial used in study. Compare to crude extract, acetone extracts shows less antibacterial activity. Acetone extracts shows more activity against *Bacillus subtilis* (10 mm) than *E. coli* (8mm) and no activity against *P. aeruginosa* (Table 1).

Result of present research indicated were supported by the work done by various workers. Alcoholic leaf extract was found to have antibacterial effect against the pathogen by Gehlot and Bohra (2000). Irobi and Bonson (1999) observed that the crude extract of *Malabarica* have no antibacterial activity against none of bacterial strain tested, Affoay and Meyer (1991) concluded that antimicrobial activity of acetone extract from the aerial part of *Helichrysum aurointnes* showed significant activity against gram positive bacteria. Sinha *et al.*, (1997) had reported that ethanolic extract of *Terminaliona mauropetra* roots, were screened for their bioactivity against bacteria. The ethanolic extract

**Table 1.** Antibacterial activity of the leaves and stem extracts of *Cleome viscosa* against different bacterial strains

Plant parts	Zone of Inhibition (mm)		
	<i>Escherichia coli</i>	<i>Bacillus subtilis</i>	<i>Pseudomonas aeruginosa</i>
Leaf extract of plant			
1. Crude	14	14	14
2. Acetone	8	10	-
Stem extract of plant			
1. Crude	8	7	8
2. Acetone	-	-	-

of *Achyroathus aspera* showed on effective partive results on *Staphylococcus aureus* (Nand Kumar *et al.*, 2006).

The finding of the present study further justify traditional use of various plants to treat various diseases. Hence, the present study also justify the claimed use of *Cleome viscosa* in traditional systems of medicine. Still there are not much reports available regarding antibacterial activity of *Cleome viscosa* against human pathogens. Thus our finding may have small start.

### REFERENCES

1. Afloyan, A.J., and Meyar, J.J., in, The antimicrobial activity of 3,4,7-triphydroxy flavones insolated from the shoots of *Helichrysum aragonites* *J. Ethnophar macula* 1997; **57**: 177-181.
2. Cowan, M.M., Plant products and antimicrobial agents, *Clinical Microbial rex.* 1999; **12**: 564-582.
3. Gehlot and Bohra, A., Antibacterial effect of extract on *Salmonella typhi*. *Indian J. of Med. Science.*, 2000; **54**: 102-105.
4. Irobi O.N. and Bonsos, A., Effect of crude leaf extract of *Acalypha* against some anaerobic bacteria. *J. of Ethnopharmacol.* 1994; **43**: 63-65.
5. Kaushik, P., Haridra (Turmeric): Antibacterial potential Choukhamba Sanskrit series office. K. 37/99 Gopal Mandir Lane. Varanasi 2003; 1-129 Colored plates - 16.
6. Kaushik, P. and Dhiman, A.K., Medicinal plants and raw drugs of India, Bishan Singh Mahinder Pal Singh Dehradun. PPX11+623 coloured plates 62. 2000.
7. Mohd Rafi, K., Sirajudeen, K and Shajahan, A., Antimicrobial activity of leaf extract of *Moringa concanensis*. *Advance Plat Science* 2005; **18**(11): 893-894.
8. Nanda Kumar, K., Tangari, N., Perumal, G., Shiva Shamugam M, and Sarganavalli, S., Antibacterial activity of traditional medicinal plants on dental paghogeus. *Indian J. of Envriion and Ecoplanning* 2006; **12**(2): 437-441.
9. Parkh Jigna. Screening of some traditionally used medicinal plants for potential antibacterial activity. Indian medicinal plants for antibacterial activity. *Indian J of Pharmaceutical Sciences.* 2006; **68**(6): 832-34.
10. Parekh Jigna and Chandu Sumitra., Screening of aqueous and alcoholic extract of some Indian medicinal plants for antibacterial activity. *Indian J of Pharmaceutical Sciences.* 2006; **68**(6): 835-38.
11. Racio, M.S., Rios, J.C. and Villar, A., A review of some antimicrobial compounds isolated from medicinal plants reported in the literature 1978-1988. *Photo, Res.* 1989; **3**(4): 117-125.
12. Segnottuvel, R., Screening of Antimicrobial properties of leaf extract of *Smilex zeulancia* and *Phyllanthus wightanus* *Advances in plant Science.* 2007; **20**(1): 273-275.
13. Suri, R.K., Chaudhari, D.C. and Jaffer, R., Commercially important medicinal plants from forests *J. Eco. Bot, Phytochemistry* 1992; **3**(2): 129-140.
14. Verma, Archana., Antimicrobial potency of sec metabolites from leaf extract of *Ipomea aquatica* forsk. *Research Hunt* 2006; **1**: 9-11.