
Antibacterial Activity of *Cyperus Rotundus* Linn

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Extracts of *Cyperus rotundus* Linn were investigated for antibacterial activity against *Staphylococcus aureus* (NCIM 2079), *Escherichia coli* (NCIM 2065), *Bacillus Subtilis* (NCIM 2063), *Pseudomonas aeruginosa* (NCIM 2036), and *Proteus vulgaris* (NCIM 2027) at 50 µg/disc using disc diffusion method. The acetone and ethanol extracts showed significant broad spectrum antibacterial activity. Our findings confirm the traditional therapeutic claims for this herb that it is useful against bacterial infection.

Cyperus rotundus Linn is a pesiferous perennial weed with dark green glabrous culms, arising from a system of underground tubers found throughout India^{1,2}. The tubers are useful in infusion or as a soup in fever, diarrhoea, dysentery, dyspepsia, vomiting and cholera. Fresh tubers are applied to the breast in the form of paste or plaster as galactagogue. Paste is applied to scorpion stings and when dried to spreading ulcers^{3,4}. In the light of above information the present investigation was undertaken, which deals with the studies of petroleum ether, benzene, chloroform, acetone and ethanolic extracts of rhizomes of *Cyperus rotundus* Linn against various gram positive and gram negative bacteria. The results of which are being reported in the present communication.

Fresh rhizomes of *Cyperus rotundus* Linn were collected from Namakkal District, Tamilnadu, India. The identity of the rhizomes has been confirmed using all official monographic specifications. Rhizomes were dried under shade, pulverised by a mechanical grinder and passed through a 40-mesh sieve. The powdered rhizomes (500 g) were extracted with petroleum ether (40-60°) (PE) in a Soxhlet extractor. The residue was then extracted successively with benzene (BE) chloroform (CE) acetone (AE) and ethanol 95% (EE) using the same method. The extracts were then distilled separately under pressure to yield solid masses which were completely free from solvents (PE - 2.4%, BE - 2.8%, CE - 1.1%, AE - 4.6% and EE - 12.3%). The solid masses were redissolved in

dimethyl formamide (DMF) to evaluate antimicrobial efficiency.

Bacterial strains used for testing included *Staphylococcus aureus* (NCIM 2079), *Escherichia coli* (NCIM 2065), *Bacillus subtilis* (NCIM 2063) *Pseudomonas aeruginosa* (NCIM 2036) and *Proteus vulgaris* (NCIM 2027). These were obtained from National Collection of Industrial Microorganisms, Pune, India. The stock culture was maintained on Mueller Hinton agar medium (Himedia chemicals) at 37°.

Antibacterial activity of the above mentioned five different extracts were tested separately using the disc-diffusion method⁵. Petriplates containing 10 ml of Mueller Hinton agar medium were seeded with 24 h old culture of a selected bacterial strain. Sterile filter paper discs (6 mm diameter) containing 50 µg/disc of a plant extract residue dissolved in DMF were placed on the surface of the medium. DMF and water alone served as negative controls. A disc containing the standard chloramphenicol (30 µg/disc) was used as a positive control. Incubation was done for 24 h at 37°. The assessment of antibacterial activity was based on the measurement of diameter of zone of inhibition formed around the disc. Six independent determinations were conducted for each extract.

Table 1 enumerates the effect of different extracts of rhizomes of *Cyperus rotundus* Linn. The acetone and ethanol extracts tested at 50 µg/disc showed significant activity against all the bacteria tested at par with 30 µg/disc chloramphenicol. The ethanolic extract was found to be much more active than the others. Plants showing

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TABLE 1: ANTIBACTERIAL ACTIVITY OF DIFFERENT EXTRACTS OF *CYPERUS ROTUNDUS* LINN

Extracts 50 µg/disc	Diameter of the inhibition zone* (mm)				
	<i>E. coli</i>	<i>S. aureus</i>	<i>B. subtilis</i>	<i>P. vulgaris</i>	<i>P. aeruginosa</i>
Pet.ether	7	9	6	9	5
Benzene	9	10	5	11	7
Chloroform	15	16	8	11	9
Acetone	23	20	19	16	11
Ethanol	26	24	22	18	14
Chloramphenicol (30 µg/disc)	30	27	27	22	17

*Size of the inhibition zone by disk diffusion method.

significant antibacterial activity in general contained alkaloids, flavonoids, tannins, polyphenolics and oil^{6,7} antibacterial activity could be attributed to any one of these constituents. These results suggest the presence of an active principle (s) with good antibacterial potency or a high concentration of a moderately active principle in the extract. This antibacterial activity would support the folk therapy of infections and traditional therapeutic claims of this herb.

REFERENCE

1. The Wealth of India, Raw materials, Vol. III, Publication and Information Directorate, CSIR, New Delhi, 1992, 424.
2. Nadkarni, K.M., and Nadkarni, A.K., In; Indian Material Medica, 3rd Edn., Vol. I, Popular Prakashan Private Ltd., Mumbai, 1996,428.
3. Kirtikar, K.R. and Basu, B.D. In; Blatter, E, Caius, J.F, and Mhaskar, K.S. Eds, Indian Medicinal Plants, 2nd Edn., Vol. II Lalit Mohan Basu, Allahabad, India, 1993,2638.
4. Chopra, R.N., Nayar, S.L., and Chopra, I.S., In; Glossary of Indian Medicinal Plants, 1st Edn., National Institute of Science Communication, New Delhi, 1996,88.
5. Bauer, A.W., Kirby, M.D.K., Sherris, J.C., and Turck, M., *Amer. J. Clin. Pathol*, 1996,45,493.
6. Gary, S.C., and Kaseera, H.I. *J. Ethnopharmacol.*, 1983,54, 37.
7. Irobi, O.N., Moo-young, M., Anderson, W.A. and Daramola, S.O., *J. Ethnopharmacol.*, 1994, 43, 223.