

## ACKNOWLEDGEMENTS

Thanks are extended to The Principal, Govt. College of Pharmacy, Karad for their invaluable assistance and encouragement.

## REFERENCES

1. Reynolds, J.E.F. and Prasad, B.A., Eds., In; Martindale-The

Extra Pharmacopoeia, 31st Edn., The Pharmaceutical Press, London, 1996, 1069.

2. Budavari, S., O'Neil, J.M., Smith, A. and Heckelman, E.P., In; The Merck Index, 11th Edn., Merck and Co. Inc., Whitehouse Station, NJ, 1989, 62.
3. Shenoy, K.R.P., Krishnamurthy, K.S. and Iyengar V., **Indian Drugs**, 2001, 38, 428.
4. Koundourellis, J.E., Mallion, E.T. and Broussali, T.A., **J. Pharm. Biomed. Anal.**, 2000, 23, 469.

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## Antimicrobial activity of *Dioscorea bulbifera* bulbils

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Accepted 24 October 2002

Revised 9 September 2002

Received 14 January 2002

The successive extracts of *Dioscorea bulbifera* (bulbils) has been investigated for *in vitro* antimicrobial activity against *Klebsiella pneumoniae*, *Escherichia coli*, *Bacillus aureus*, *Proteus vulgaris*, *Staphylococcus aureus*, *Aspergillus niger*, *Aspergillus flavus*, *Aspergillus fumigatus* and *Rhizopus nigricans*. The petroleum ether and chloroform extracts showed significant activity against *A. fumigatus* and *R. nigricans*. The petroleum ether and distilled water extract showed good activity against *K. pneumoniae*. The chloroform extract showed feeble activity against *S. aureus*.

*Dioscorea bulbifera* L. (Dioscoreaceae) is a climber widely distributed in India, Ceylon, Malay peninsula, Australia, E. Africa and Brazil. *D. bulbifera* is one of the major Indian medicinal plants used in the three indigenous systems of medicine<sup>1</sup>. Traces of diosgenin (4%) are present in *D. bulbifera*<sup>2,3,4</sup>. *D. bulbifera* has diuretic and antiinflammatory activity<sup>5</sup>. Sterols and diterpenoids have been reported from this plant<sup>6</sup>. This communication reports the antimicrobial activity of bulbils of *D. bulbifera*.

The plant was collected from Gulbarga University Campus, Gulbarga in January 2001 and authenticated at the Botany Department, Gulbarga University with the help of Flora of Gulbarga District<sup>7</sup> where a voucher specimen is

deposited (Voucher No. HGUG-785). The bulbils were cut, shade dried and coarsely powdered. The powdered plant material was subjected for successive extraction with petroleum ether, chloroform, ethanol (95%) and distilled water using Soxhlet extractor. The extracts were concentrated to dryness *in vacuo*. Four milligrams of each extract is dissolved in 1 ml of distilled dimethylformamide. The antimicrobial activity was assayed by agar well diffusion method<sup>8</sup>. The *in vitro* screening was carried out using *Klebsiella pneumoniae*, *Escherichia coli*, *Bacillus aureus*, *Proteus vulgaris*, *Staphylococcus aureus*, *Aspergillus niger*, *Aspergillus flavus*, *Aspergillus fumigatus* and *Rhizopus nigricans*.

Streptomycin sulphate (4 mg/ml of distilled water) and nystatin (4 mg/ml of distilled water) was used as a standard for bacteria and fungi respectively. The petroleum ether extract showed significant activity against *A. fumigatus* (16.5

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TABLE 1: IN VITRO ANTIMICROBIAL ACTIVITY OF DIOSCOREA BULBIFERA BULBILS.

Organisms	Zone of Inhibition (mm)*					
	1	2	3	4	5	6
<i>Klebsiella pneumoniae</i>	15.0±1.0	12.0±.03	12.0±.02	15.0±.02	16.0±0.1	ND
<i>Escherchia coli</i>	11.5±0.5	12.5±.02	12.5±.03	11.0±0.5	16.0±.15	ND
<i>Bacillus aureus</i>	15.0±1.0	13.5±0.4	13.5±0.1	15.5±.03	18.0±0.4	ND
<i>Proteus vulgaris</i>	13.5±0.5	13.0±.03	12.5±.04	14.0±.05	16.5±.03	ND
<i>Staphylococcus aureus</i>	12.5±.31	8.0±.03	13.5±.03	12.5±.40	16.5±.50	ND
<i>Aspergillus niger</i>	14.5±.20	15.0± .02	12.5±.03	13.5±.02	ND	16.0± 02
<i>Aspergillus flavus</i>	13.0±.10	15.0±.05	17.0±.05	13.0±1.0	ND	20.0±.20
<i>Aspergillus fumigatus</i>	16.5±.30	16.0±.40	11.5±.31	12.0±.40	ND	16.0±.03
<i>Rhizopus nigricans</i>	20.5±.20	21.5±.10	14.5±.10	18.5±.31	ND	20.0±.05

\*All the values are mean±standard deviation of 3 determinations. 1. Petroleum ether extract; 2. Chloroform extract; 3. Ethanol extract; 4. Distilled water extract (4 mg/ml dimethylformamide); 5. Strept-streptomycin sulphate (1 mg/ml of distilled water); 6. Nyst-nystatin (1mg/ml of distilled water); ND, Not done.

mm) and *R. nigricans* (20.5 mm). The chloroform extract showed marked activity against *A. fumigatus* (16.0 mm) and *R. nigricans* (21.5 mm) equating to the standard. Petroleum ether and distilled water showed good activity against *K. pneumoniae* (15.0 mm and 15.0 mm, respectively). The chloroform extract showed feeble activity against *S. aureus* (8.0 mm). In spite of tremendous development in the field of synthetic drugs during recent era, higher plants still hold their own place as of a source of several effective drugs in place of synthetics, which have severe side effects. Therefore, a systematic approach should be made to find out the efficacy of plants against pathogenic microorganisms so as to exploit them as herbal antimicrobial agents.

#### ACKNOWLEDGEMENTS

One of the authors, G. Jyothishwaran is grateful to The Council of Scientific and Industrial Research, New Delhi, for the award of a Junior Research Fellowship. The authors

thank Dr. G. M. Vidyasagar for providing technical assistance.

#### REFERENCES

1. Kamboj, V.P., *Current Sci.*, 2000, 78, 35.
2. Coursey, D.G., In; Simmonds, N.W., Eds., *Evolution of Crop Plants*, Longman publishing company, London, 1976, 70. 3. Quigley, F.R., *Planta Med.*, 1978, 33, 414.
4. Kokate, C.K., Purohit, A.P. and Gokhale, S.B., In ; *Pharmacognosy*, 12th Edn., Nirali Prakashan, Pune, 1999, 45.
5. Dhawan, B.N., Patnaik, G.K., Rastogi, R.P., Singh, K.K. and Tandon, J.S., *Indian J. Exp. Biol.*, 1977, 15, 208.
6. Seetharam, Y.N., Kotresha, K. and Uplaonkar, S.B., In; *Flora of Gulbarga District*, Gulbarga University, Gulbarga, 2000, 60.
7. Murray, R.D.H., Jorge, Z.D., Kahn, N.H., Shahijahan, N. and Quaisuddin, M., *Phytochemistry*, 1984, 23, 623.
8. Ashworth, J., Hargreaves, L.L., Rosser, A. and Javis, B., In; *Some Methods for Microbiological Assay*, Academic Press, London, 1975, 75.