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Antimicrobial activity of various extracts of Striga Sulphurea and Hemidesmus Indicus

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The in vitro antimicrobial activity of different extracts of Striga sulphurea **(Scrophulariaceae) and** Hemidesmus indicus **(Asclepiadiaceae) against** Staphylococcus aureus, Escherichia coli, Pseudomonas aeruginosa **and** Aspergillus niger **have been carried out. The ethanol (95%) extract of** S. sulphurea **showed high activity against all the bacteria tested. The chloroform and ethanol (95%) extracts of** H. indicus **showed antifungal activity against** A. niger.

PLANTS have been widely used in folk medicine for centuries. Plants belonging to the genus Striga (Scrophulariaceae), *S. lutea, S. densiflora* and *S. orobanchioides* are known for antifertility[1-4] and antimicrobial[5-6] properties. However, no chemical and biological investigations have been carried out on *S. sulphurea.*

The medicinal value of the roots of *H. indicus* (Asclepiadiaceae) in the Indian system of medicine are well known[7-8]. The roots are given in case of diarrhoea, dysentry, leprosy, leucoderma, skin diseases and syphilis. Eventhough there are several reports of chemical investigation available,[8-14] no biological studies have been reported so far on this plant.

The present study has been taken upto evaluate the antimicrobial efficacy of the various extracts of *S. sulphurea* and *H. indicus.*

MATERIALS AND METHODS

Plant material

Whole plants of *S. sulphurea* and the roots of *H. indicus* were collected from the fields in and around Karnataka University, Dharwad and Gulbarga University, Gulbarga, recepectively, during September-October 1995 and authenticated at the Herbarium, Department of Botany, Gulbarga University, Gulbarga. The plant materials were shade-dried and powdered.

Preparation of extracts

The powdered plant materials were subjected to Soxhlet extraction separately and successively with petroleum ether (60-80°), chloroform, ethanol (95%) and distilled water. The extracts were concentrated to dryness in a flash-evaporator under reduced pressure and controlled temperature (50-60°). All the extracts were stored in a refrigerator. The doses of the extracts were prepared in distilled dimethyl formamide (DMF).

Antimicrobial testing

The *in vitro* antimicrobial activity was carried out against 24 h cultures of three selected bacteria and one fungus. The bacteria used were *S. aureaus, E. coli* and *P. aeruginosa* and the fungus used was *A. niger.*

* For correspondence

Table 1 : *In vitro* antimicrobial activity of *S. sulphurea* and *H. indicus*

Sl. No.	Crude solvent extracts and standards	Diameter of zone of inhibition in mm*			
		S. aureus	*E. coli*	*P.aeruginosa*	*A. niger*
1.	*S. sulphurea*				
	Petroleum ether extract	10	09	10	09
	Chloroform extract	10	09	09	12
	Ethanol (95%) extract	20	18	24	10
	Distilled water extract	10	14	16	10
2.	H. indicus				
	Petroleum ether extract	12	10	09	09
	Chloroform extract	11	12	09	18
	Ethanol (95%) extract	10	09	09	17
	Distilled water extract	10	09	09	10
3.	Gentamycin	29	27	28	–
4.	Nystatin	–	–	–	26

* Including diameter of the well - 8 mm. Control (DMF) = No activity.

The antimicrobial activity was performed by cup plate method[15]. Nutrient agar and potato dextrose agar were used to culture the bacteria and fungi, respectively. A 5% w/v test solution of each extract was prepared by dissolving 250 mg of each extract separately in 5 ml of sterile DMF. Eight different test solutions of *S. sulphurea* and *H. indicus* extracts were thus obtained. A 0.1% w/v solution of gentamycin and nystatin were prepared in sterile water and used as standards for comparision of antibacterial and antifungal activities, respectively. The plates were inoculated with 24 h culture of respective bacteria and fungi. With the help of a sterile cork borer (8 mm), cups were cut out and into each of these cups, 0.1 ml of each of the test solution as well as standard solutions and the blank (DMF) were placed separately, under aseptic conditions with the help of sterile syringes. The plates were then maintained at room temperature for 2 h to allow the diffusion of the solutions into the medium and incubated at 37±0.5° for bacteria and at room temperature for fungi, respectively. Inhibition was recorded by measuring the diameter of the inhibition zone at the end of 24 h for bacteria and 48 h for fungi. Each experiment was repeated thrice and the average of three independent determination were recorded.

RESULTS AND DISCUSSION

Results of antimicrobial screening of the extracts of *S. sulphurea* and *H. indicus* are summarised in Table-1. It was found that ethanol (95%) extract of *S. sulphurea* possess high antibacterial activity against all the bacteria tested. Similarly, the distilled water extract showed moderate activity against *E. coli* and *P. aeruginosa*. The chloroform extract revealed weak activity against *A. niger*.

The chloroform and ethanol (95%) extracts of *H. indicus* showed high antifungal activity against *A. niger*. The petroleum ether extract exhibited weak activity against *S. aureus* and the chloroform extract

has shown weak activity against *S. aureus* and *E. coli.* Except these, the extracts of *S. Sulphurea* and *H. indicus* were found to be inactive against all the test organisms.

From the above results, it can be concluded that the high antibacterial activity of the ethanol extract of *S. sulphurea* and the high antifungal activity of the chloroform and ethanol extracts of *H. indicus* are slightly lower than that of the respective commercial standards used.

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