Antibacterial and Antifungal Activities of *Striga Densiflora* and *Striga Orobanchioides*

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Four successive solvent extractions, of *Striga densiflora*, Benth. and *Striga orobanchioides*, Benth. have been studied for their antimicrobial activity against certain pathogenic and nonpathogenic bacteria and fungi using the cupplate method. The petroleum ether, chloroform and ethanol extracts of both plants showed antibacterial activity against most of the organisms, whereas the aqueous extracts were found to have no effect against most bacteria. Of the eight extracts, only the petroleum ether extract of *Striga orobanchioides* has marked antifungal activity against *Aspergillus niger*.

MEDICINAL plants have been a source of compounds for many centuries. They have been used extensively as pure compounds or as a crude material. There are about 30 plants belonging to the genus **Striga** Lour. [Scrophulariaceae]. They are parasitic for semiparasitic herbs usually scabrious, discoloured or black when dry[9]. Among them **Striga orobanchioides**, Benth. is known to be used in diabetes and **Striga lutea**, Lour. has several medicinal properties.[1-8] Earlier studies in our laboratory have shown that **Striga lutea**, Lour and **Striga orobanchioides**, Benth. exhibit antifertility activity[4]. Two flavones, acacetin and luteolin, were isolated from **Striga lutea**, which showed good antifertility activity.[2,3,5] Antimicrobial and anthelmintic activities of **Striga lutea** have also been examined.[6] To date no other biological activity tests have been carried out on **Striga densiflora** and **Striga orobanchioides**. Hence an attempt is made to study the antibacterial and antifungal activities of various extracts of these two plants.

The plants were collected from the fields in and around Gulbarga during November 1992 and authenticated from the Herbarium, Department of Botany, Gulbarga University, Gulbarga. The whole plant of both **Striga** species–roots, leaves, flowers and stem, were dried under shade, powdered and 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 extracts were stored in a refrigerator. Each extract was tested separately for antibacterial activity against **Escherichia coli, Staphylococcus citreus, Staphylococcus aureus, Pseudomonas aeruginosa, Klebsiella pneumoniae** and for antifungal activity against **Asepergillus niger** and **Candida albicans.**

For the antimicrobial assays, the **in vitro** cup diffusion method was adopted[7]. Nutrient agar and Sabouraud's Dextrose agar were used to cultivate the bacteria and fungi, respectively. Peptone water (1%) was used for fresh culture of all the bacteria and the fungi were maintained by periodic subculturings of fresh Nutrient agar and Sabouraud's Dextrose medium. The petroleum ether, chloroform and ethanol extracts were dissolved in distilled dimethyl formamide to give a 1 mg/ml solution. Distilled water extract was dissolved in distilled water to give a 1 mg/ml solution. Hundred ml portions of the molten agar (45°) were inoculated with the desired volume of a fresh culture of the test organisms to give an inoculate of approximately 10^6 cells/ml. The agar was poured onto plates and after solidification, cups (8 mm dia) were made. To each of

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Table - 1: Antibacterial and antifungal activities of various extracts of *Striga orobanchioides* and *Striga densiflora*

Sl. No.	Crude extracts and Standard	Amount/ Cup	Diameter of Zone of Inhibition in mm*						
			E.coli	S.aureus	Kl.pneumoniae	S.citreus	P.aeruginosa	A.niger	C.albicans
1.	**S.densiflora**								
	Petroleum ether	100 μg	12	12	14	12	12	11	—
	Chloroform	100 μg	15	13	15	14	13	10	13
	Ethanol	100 μg	14	14	15	13	14	13	—
	Distilled water	100 μg	—	—	10	—	—	—	—
2.	**S.orobanchioides**								
	Petroleum ether	100 μg	16	15	15	13	10	18	12
	Chloroform	100 μg	16	16	14	13	12	—	—
	Ethanol	100 μg	16	17	12	14	18	10	12
	Distilled water	100 μg	13	—	—	10	—	—	—
3.	**Standards**								
	Gentamicin	10 μg	23	23	16	20	16	—	—
	Sulphamethoxazole	20 μg	19	18	15	19	15	—	—
	Nystatin	50 I.U.	—	—	—	—	—	25	23

* Including diameter of the disc - 8 mm.
Control Solvent DMF - NIL
Values are averages of three determinations.

these cups 0.1 ml aliquots of the test solution, solvent control and reference standard solutions gentamicin, 10 μg and sulphamethoxazole 20 μg for bacteria and nystatin 50 I.U for fungi were placed per cup. For assaying antibacterial activity, plates were incubated at $37\pm1^{\circ}$ for 24 h whereas for antifungal activity they were incubated at 26° for 48 h. The diameter of zone of inhibition was measured as an average of maximum dimensions of zones around the discs. All the experiments were repeated 3 times and the average values recorded in Table-1.

RESULTS

From Table-1 it is evident that the petroleum ether, chloroform and ethanol extracts of both the plants are endowed with mild to marked antibacterial activity against most of the tested bacteria. However, the aqueous extracts are found to have no effect against most of the tested organisms. The results have been compared with the standards gentamicin and sulphamethoxazole. The extracts of **S. orobanchioides** showed better antibacterial activity compared to the extracts of **S. densiflora.** The maximum inhibitory effect was observed by the ethanolic extract of **S. orobanchioides** against **P. aer-**

uginosa, comparatively lesser against **S. aureus** and **E. coli**. The same was least active against **Kl. phenumoniae**.

The data on antifungal activity revealed that the petroleum ether extract of **S. orobanchioides** had maximum inhibitory activity against **A. niger**. All the remaining extracts of both plants showed mild or no effect against the fungus tested. All the four extracts of both the plants showed less activity compared to standard drugs except ethanol extract of **S. orobanchioifrd** on **P. aeruginosa**.

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