

ANTIMICROBIAL SCREENING OF SOME *FABACEOUS* PLANT SPECIES OF RAJASTHAN DESERT

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ABSTRACT

Antimicrobial screening of ethyl ether and alcoholic extracts of leaves of three selected plant species of family Fabaceae growing in Rajasthan Desert was carried out. *Clitoria ternatea*, *Sesbania bispinosa* and *Tephrosia purpurea* showed positive reactions against bacterial pathogens i.e. *Staphylococcus aureus*, *Escherichia coli* and a fungal pathogen *Candida albicans*.

KEY WORDS

Antimicrobial screening, Fabaceous plant species, Rajasthan Desert

INTRODUCTION

The plants growing in Rajasthan Desert are a potential source of phytochemicals of pharmaceutical interest such as flavonoids, sterols, steroidal sapogenins, alkaloids, phenolic compounds, sulphides, isothiocyanates, anthocynins, terpenoids etc. These are the active principles, which act as antioxidants, anticarcinogenic, antimicrobials and immunity stimulants.

From this arid region of Rajasthan, three plant species of family Fabaceae like *Clitoria ternatea*, *Sesbania bispinosa* and *Tephrosia purpurea* have been selected for antimicrobial screening.

A number of plants have been screened for their antimicrobial activity [1-7]. The antimicrobial principles and their distribution in plants have been reported by many workers [8-13]. Present investigation describes the antimicrobial activity of leaf extracts of four selected tree species against *Staphylococcus aureus* (Gram positive), *Escherichia*

coli (Gram negative) and *Candida albicans* (Fungal pathogen).

MATERIALS AND METHODS

Fresh leaves of all the selected plant species were collected from Bikaner district and pulverized into a paste. Cold extraction was done by blending the paste with ethyl ether and 50% ethanol in the ratio of 1: 2, in a Warring Blender at 2500 rpm for 10 min. The mixture was centrifuged at 3000 rpm. The supernatant was evaporated to dryness and the residue was suspended in double distilled water. The micro-organisms used for screening were *Staphylococcus aureus* (Gram positive), *Escherichia coli* (Gram negative) and *Candida albicans* (Fungal pathogen). The growth medium used for *Staphylococcus aureus* and *Escherichia coli* was Nutrient broth (10% peptone, 0.5% labanco and 0.5% NaCl, pH adjusted to 7.5) and for *Candida albicans* Sabourands liquid medium (1% peptone, 4% glucose, pH adjusted to 5.8).

Paper discs of known concentration of standard antibiotics namely chloramphenicol, penicillin and mycostatin were used for comparison [14]. Blank paper discs were used as control. Control discs dipped in ethyl ether and 50% ethanol; plates (5 each for *Staphylococcus aureus*, *Escherichia coli* and *Candida albicans*) were employed for each extract. The ratio of inhibition zone the various test samples was

compared with the inhibition zone from the high concentration antibiotic reference discs.

RESULTS AND DISCUSSION

Ethyl ether and alcoholic extracts of leaves of *Clitoria ternatea*, *Sesbania bispinosa* and *Tephrosia purpurea* showed positive reactions against all the three test organisms.

Table 1. Antimicrobial screening of selected Fabaceous plant species

Plants	Extract	Test Organisms				
		<i>S. aureus</i>		<i>E. coli</i>		<i>C. albicans</i>
		I/C ^a	I/P ^a	I/C ^a	I/S ^a	I/M ^a
<i>Clitoria ternatea</i>	Ether	0.38	0.36	0.92	0.88	0.54
	Alcoholic	0.64	0.51	0.82	0.80	0.66
<i>Sesbania bispinosa</i>	Ether	0.54	0.56	0.63	0.67	0.45
	Alcoholic	0.60	0.62	0.65	0.66	0.51
<i>Tephrosia purpurea</i>	Ether	0.86	0.80	0.64	0.68	0.69
	Alcohol	0.75	0.72	0.58	0.61	0.80

a= Ratio of diameters of the inhibition zone to leaf extracts (10µg) under observation (I) and diameter of inhibition zone due to standard reference antibiotics.

C= Chloramphenicol (30µg) against *S. aureus* = 30 mm and *E. coli* = 32 mm.

S= Streptomycin (10 µg) against *E. coli* = 20 mm

P= Penicillin (10 units) against *S. aureus* = 32 mm.

M = Mycostatin (100 units) against *C. albicans* = 32 mm.

The present study indicates that these plant species of Fabaceae family growing in this arid region of Rajasthan have definitely some antimicrobial principles as secondary products, which are responsible for antibacterial and antifungal activity. Thus, the activity of all these test extracts against

both bacterial and fungal pathogens, indicate that these arid plants are more resistant to bacterial and fungal attacks due to the presence of some biologically active substances, So these can be used in pharmaceutical and drug industries.

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