Year: 2014; Volume: 1; Issue: 1
Article ID: MI14 03; Pages: 1-4

BioMed Research

The Open Access Publisher

www.bmrjournals.com

BMR Microbiology

Research Article

Antimicrobial Screening of Some Medicinal Tree Species of Sikar District of Rajasthan

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Received 30 March 2014; Accepted 07 April 2014; Published 08 April 2014

Abstract

Antimicrobial screening of ethyl ether and alcoholic extracts of leaves of three selected medicinal *tree* species growing in Sikar district of Rajasthan was carried out. *Ailanthus excelsa, Pongamia pinnata* and *Salvadora oleoides* showed positive reactions against bacterial pathogens i.e. *Staphylococcus aureus, Escherichia coli* and a fungal pathogen *Candida albicans.*

Keywords: Antimicrobial screening, Medicinal tree species, Sikar district, Rajasthan

Introduction

The trees growing in Sikar district of Rajasthan are a potential source of phytochemicals of pharmaceuticals like flavonoids, sterols, steroidal sapogenins, alkaloids, phenolic compounds, sulphides, isothiocynates, anthocynins, terpenoids etc. These are the active principles, which act as antioxidants, anticarcinogenic, antimicrobials and immunity stimulants. From this region of Rajasthan, three medicinal tree species like *Ailanthus excelsa, Pongamia pinnata and* Salvadora oleoides 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 [8-14].

Materials and Methods

Present investigation describes the antimicrobial activity of leaf extracts of three selected tree species against *Staphylococcus aureus* (Gram positive), *Escherichia coli* (Gram negative) and *Candida albicans* (Fungal pathogen).

Fresh leaves of all the selected tree species were collected from Jodhpur 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. 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 [15].

Results and Discussion

Antimicrobial screening of ethyl ether and alcoholic (50% ethanol) extracts of leaves of . *Ailanthus excelsa, Pongamia pinnata* and *Salvadora oleoides* showed positive reactions against all the three test organisms. (Table-1)

Table - 1. Antimicrobial screening of selected medicinal tree species

Plants	Extract	Test Organisms				
		S. aureus		*E. coli*		*C. albicans*
		I/C[a]	I/P[a]	I/C[a]	I/S[a]	I/M[a]
Ailanthus excelsa	Ether	1.50	1.09	0.53	0.88	0.58
	Alcoholic	0.88	0.61	1.00	1.36	0.53
Pongamia pinnata	Ether	0.57	0.61	1.00	1.62	0.53
	Alcoholic	0.64	0.75	0.50	0.73	0.69
Salvadora oleoides	Ether	0.90	0.78	1.00	0.84	0.66
	Alcohol	0.91	0.84	0.69	0.64	0.81

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.

Maximum antibacterial activity was exhibited by the extracts of leaves (ether extract and alcoholic extract) of *Ailanthus excelsa* against *Escherichia coli* and *Staphylococcus aureus* whereas leaves extracts of *Salvadora oleoides* shows maximum activity against *Candida albicans*.

The present study indicates that these medicinal tree species growing in this 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.

Acknowledgement

We express sincere thanks to Head, Department of Microbiology, S.P. Medical College, Bikaner for providing research facilities.

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