ANTIBACTERIAL ACTIVITY OF DIFFERENT EXTRACTS OF BARK OF BARRINGTONIA ACUTANGULA (L.) GAERTN

R.Shyam Sunder[1], K.Rajendra Prasad[1] Mohib Khan*[2] and Vemuri Sastry[2]
[1]University College of Technology, Osmania University, Hyderabad – 500 007
[2]Mesco College of Pharmacy, Hyderabad – 500 006

ABSTRACT

Barringtonia acutangula (L.) Gaertn belonging to family Barringtoniaceae was investigated to evaluate in vitro antibacterial activity of aqueous, chloroform and methanolic extracts of bark against Bacillus subtilis, Pseudomonas aeruginosa, and Escherichia coli the major urinary tract infection causing pathogens were tested by disc diffusion assay method. Chloroform extract exhibited more activity than aqueous and methanolic extract against the pathogens under test.

Keywords: Antibacterial activity, B. acutangula, P. aeruginosa, E. coli and B. subtilis

1. INTRODUCTION

Barringtonia acutangula (L.) Gaertn belonging to family Barringtoniaceae is a medium size glabrous tree found throughout India in deciduous and evergreen forests, mostly along the bank of rivers and streams (Warrier, 1994). It is used in the folklore in vitiated conditions of kapha and pitta, arthralgia, dysmenorrhea, plumbago, skin diseases, diarrhea, inflammation, flatulence, leprosy, hemorrhoids, as an anthelmintic(Satapathy, 1994). The plant has been reported to have anti-implantation activity in female albino rats (Mathur, 1983). In Ayurveda, its preparations include powder and pastes. Till date aqueous, ethanolic, chloroform and petroleum ether extracts of seeds are used for antibacterial activity (Sahoo, 2008). The present study is intended to determine the antibacterial activity of aqueous, chloroform and methanolic extract of bark of the plant against selected pathogens by disc diffusion assay (Mishra, 2006; Indian Pharmacopoeia, 1996).

2. MATERIALS AND METHODS

The plant material was collected from BANK OF Pakala River located in the Pakala Forest, Narsampet (Mandal), Warangal (Dist) and authenticated by the taxonomist of Department of Botany, Osmania University, Hyderabad. After authentification the barks were separated out, shade dried for 25 days and then dried in the hot air oven at 50 °C for 12 hour. Dried bark was pulverized by a mechanical grinder and the coarse powder obtained was taken for extraction in chloroform followed by methanol (95%) and water by using Soxhlet assembly for 48 hour each. The extracts were dried under reduced pressure and the percentage of yield was calculated on the dried weight of extract. The in vitro screening for antimicrobial was carried out using selected pathogens which includes one gram positive bacteria (Bacillus subtilis) and two gram negative bacteria (Escherichia coli, and Pseudomonas aeruginosa). Strains each of the 3 bacterial species were used in this study were obtained from Department of Microbiology, Osmania University, Hyderabad. The antibacterial screening of the extracts were carried out by determining the zone of inhibition using disc diffusion method. The extracts dissolved in dimethylformamide (DMF) at a concentration of 50 mg/ml and finally sterilized by filtration using 0.45 ìm Millipore filters. The sterile discs (6 mm in diameter) were impregnated with 2.5 ìl of above extract solution to achieve desired concentration of 125 ìg/disc and placed in inoculated agar. Ampicillin (25 ìg/disc) was used as standards. The inoculated plates with the test and standard discs on them were incubated at 37 °C for 24 hour. The zone of inhibition of different extracts of bark and standard drug-Ampicillin by disc diffusion method was measured. Table1.

Corresponding address;
Mohib Khan
Mesco College of Pharmacy,
Hyderabad – 500 006

3. RESULT AND DISCUSSION

All extracts of B. acutangula at 125 ìg/disc showed optimum activity against all tested pathogens. Results of disc diffusion method as indicated in Table 1 revealed that chloroform extract showed highest activity against the pathogens under test. The chloroform extract showed highest inhibition against P. aeruginosa and B. subtilis (19.0.±0.75 mm) and lowest E. coli (17.1±0.75 mm), the methanolic extract showed maximum against B. subtilis (15.1±0.70 mm), optimum against P. aeruginosa (12.1±0.75 mm) and minimum against E. coli (10.1±0.75 mm) while aqueous extract showed maximum against P. aeruginosa (13.0±0.75 mm), optimum against B. subtilis (12.1±0.70 mm) and minimum against E. coli (11.0±0.75 mm).

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Table 1. Antibacterial activity of Barringtonia acutangula extracts by disc diffusion method

Name of extract/drug	Pseudomonas aeruginosa	Escherichia coli	Bacillus subtilis
	Zone of inhibition in mm		
Aqueous	13	11	12
Chloroform	19	17	19
Methanol	12	10	15
Ampicillin	22	19	24

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