Int. J. Chem. Sci.: 7(3), 2009, 1751-1756

ANTIBACTERIAL ACTIVITY OF HEXANE AND ACETONE EXTRACTS OF *PELTOPHORUM PTEROCARPUM CALVILLEA RACEMOSA* AND *BAUHINIA PURPUREA*

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ABSTRACT

Hexane/acetone extracts of *peltophorum pterocarpum colvillea racemosa* and *bauhinia purpurea* of family Caesalpiniaceae were analyzed for antibacterial activity against eight selected clinical isolates. *S. aureus*, *S. epidermidis*, *P. aeuriginosa*, *K. pneumoniae*, *B. subtilis*, *S. marcescens*, *E. coli* and *P. fluorescens*. Among the three plants, hexane extract of P. pterocarpum extract showed maximum inhibition against organism *K. pneumoniae* of 225 μg/mL concentration and minimum zone of inhibition was observed in acetone extracts of *C. racemosa* and *B. purpurea* of 75 μg/mL concentration against organism *E. coli*, respectively.

Key words : Antibacterial activity, Plant extracts, Bacterial strains, Caesalpiniaceae

INTRODUCTION

Herbal medicine is the oldest form of health care known to mankind. Many drugs commonly used today are of herbal origin. Herbal medicine can be broadly classified into various basic systems like Ayurveda, Homeopathy, Siddha and Unani, Traditional and Chinese herbalism, which is part of traditional oriental medicine. Ayurvedic herbalism, which is derived from Ayurveda and Western herbalism originally came from Greece and Rome to Europe and then spread to North America. Traditional herbalism is an important source of potentially useful new compounds for development of chemotherapeutics. Scientific research on medicinal plants should identify the active principles in the plants. Scientific examination of the remedies could lead to standardization and quality control of the products to ensure their safety. As such evaluations can be approved and could also lead to the development of new drugs. In India, over 3600 plant species have been considered useful in traditional system of medicines like Ayurveda,

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Unani, Siddha and Homeopathy. A country like India is very much suited for development of drugs from medicinal plants. India has a rich heritage of knowledge on plant based drugs both for used in preventive and curative medicines. Numerous studies have been carried out on extracts of various natural products for screening antimicrobial activity. Aqueous ethanolic and chloroform extracts of *peltophorum pterocarpum, colvillea racemosa* and *bouhinia purpurea* are reported to posses anti-inflammatory activities and methanolic extract is reported against diuretic activity.

EXPERIMENTAL

Three plant species of Caesalpiniaceae *peltophorum pterocarpum Colvillea racemosa Bauhinia purpurea* were collected from coastal Andhra Pradesh. They were identified and authentified. The plant materials were air dried for seven days. The crude dried powdered materials of plants were extracted with hexane and acetone separately in Soxhlet apparatus concentrated to small bulk and the extract residues were weighed.

Determination of antibacterial activity

Eight clinical isolates *S. aureus*, *P. aeruginosa*, *S. epidermidis*, *K. pneumoniae*, *B. subtilis*, *S. marcescens*, *E. coli* and *P. fluorescens* were used. Standard ciprofloxacin 10 μg/mL was used. Antibacterial activity was determined by the agar cup plate method. Petriplates containing 20 mL of nutrient agar medium (pH 7.2-7.4) with 24 hours culture of the bacterial strains. Wells 8 mm diameter were cut into the agar and the hexane and acetone extracts of the three plant species were tested. The inoculums size was adjusted so as to deliver final inoculums of approximately 10^8 colony forming units CFS/ unit. Incubation was performed at 37°C for 24 hours. Assessment of antibacterial activity was based on measurement of diameter of inhibition zone formed around the well.

RESULTS AND DISCUSSION

Hexane extract of *peltophorum pterocarpum* extract showed maximum inhibition against organism *K. pneumoniae* of 225 μg/mL concentration and minimum zone of inhibition was observed in acetone extracts of *C. racemosa* and *Bauhinia purpurea* against organism *E. coli* of 75 μg/mL concentrations, respectively. The results are given in Tables 1-4. These results are consistent with previous reports on related plants regarding antibacterial activity. From the study, it can be concluded that plant extracts have great potential as antibacterial compounds against microorganisms and that they can be used in the treatment of various infectious diseases caused by resistant microorganisms. Invention

of bioactive natural products leads to development of new pharmaceuticals that address hither to natural therapeutic needs. Such screening of various naturally extracted organic compounds are needed for drug discovery, which will play an important role later in the drug development.

Table 1: Antibacterial activity of hexane extract of *Peltophorum pterocarpum, Colvillea racemosa* and *Bauhinia purpurea*

Treatments	Concentration µg/mL	Zone of inhibition (mm)			
		S. auerus	***S. epidermidis***	***P. aeruginosa***	***K. pneumoniae***
Standard ciprofloxacin	10	29	30	30	30
P. pterocarpum	75	20	21	22	22
	150	22	22	22	23
	225	24	23	24	25
C. racemosa	75	18	18	19	19
	150	21	20	21	21
	225	23	22	22	23
B. purpurea	75	18	17	18	19
	150	20	19	20	20
	225	21	21	21	22

Table 2: Antibacterial activity of hexane extract of *Peltophorum pterocarpum, Colvillea racemosa* and *Bauhinia purpurea*

Treatments	Concentration µg/mL	Zone of inhibition (mm)			
		B. subtilis	***S. marcescens***	***E. coli***	***P. fluorescens***
Standard Ciprofloxacin	10	29	30	30	30
P. pterocarpum	75	16	17	19	18
	150	18	18	20	19
	225	20	19	21	21

Cont…

Treatments	Concentration µg/mL	Zone of inhibition (mm)			
		B. subtilis	***S. marcescens***	***E. coli***	***P. fluorescens***
C. racemosa	75	16	16	17	17
	150	18	17	18	18
	225	19	18	19	20
B. purpurea	75	17	16	15	17
	150	18	17	16	18
	225	20	19	18	20

Table 3: Antibacterial activity of acetone extract of *peltophorum pterocarpum* *Colvillea racemosa* and *Bauhinia purpurea*

Treatments	Concentration µg/mL	Zone of inhibition (mm)			
		S. auerus	***S. epidermidis***	***P. aeruginosa***	***K. pneumoniae***
Standard Ciprofloxacin	10	29	30	30	30
	75	18	21	22	22
P. pterocarpum	150	19	22	22	23
	225	21	23	24	25
	75	18	17	19	18
C. racemosa	150	19	18	21	19
	225	21	20	22	21
	75	18	16	18	18
B. purpurea	150	19	18	19	20
	225	21	20	22	21

Table 4: Antibacterial activity of acetone extract of *Peltophorum pterocarpum, Colvillea racemosa* and *Bauhinia purpurea*

Treatments	Concentration µg/mL	Zone of inhibition (mm)			
		B. subtilis	***S. marcescens***	***E. coli***	***P. fluorescens***
Standard Ciprofloxacin	10	29	30	30	30
P. pterocarpum	75	15	15	17	17
	150	16	17	19	19
	225	18	18	20	20
C. racemosa	75	15	15	14	16
	150	17	16	16	18
	225	18	17	17	19
B. purpurea	75	14	15	14	15
	150	16	16	15	17
	225	18	18	17	18

ACKNOWLEDGEMENT

The authors are thankful to EPOC Herbals Research and Development Laboratories Pvt. Ltd. Chennai for providing necessary facilities.

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Accepted : 11.05.2009