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ANTIBACTERIAL ACITIVITY OF METHANOLIC EXTRACT OF ROOTS OF *CAESALPINIA PULCHERRIMA*

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ABSTRACT

Methanolic extract of roots of *Caesalpinia pulcherrima* (family Fabaceae) was analyzed for antibacterial activity against four clinical isolates. Results against the selected microorganism *Klebsilla pneumonia*, has shown that the zone of inhibition was moderately higher than the other three selected microorganisms.

Key words : Plant extract, Antibacterial activity, *Caesalpinia pulcherrima*

INTRODUCTION

Caesalpinia pulcherrima belongs to kingdom plantae, division magnoliophyta, class magnoliopsida order fabales family Fabaceae, subfamily Caesalpinodeae genus Caesalpinia. It is a shrub growing to 3m tall. The leaves are bipinnate, 20-40 cm long, bearing 3-10 pairs of pinnae each with 6- 10 pairs of leaf lets 15-25 mm long and 10-15 mm broad. The flowers are borne in racemes upto 20 cm each flower with five yellow orange red petals. The fruit is a pod 6- 12 cm long. *Caesalpinia pulcherrima* ethanolic extract of the dry fruits is reported to exhibit a broad spectrum of antimicrobial activity against *P. vulgaris*, *P. aeuriginosa* and *S. aureus*. In *Caesalpinia pulcherrima* five isolated flavanoids viz., 5, 7 – dimthoxy-3, 4-methylenedioxyflavanone, isobunducellin, 2-hydroxy-2, 3, 4, 6-tetramethoxychalcone and bonducellin are reported to possess anti-inflammatory activities. In *Caesalpinia pulcherrima* new flavonoids reported are 5, 7-dimethoxy 3, 4-methylenedoxyflavanone and bonducellin along with 2 hydroxy-2, 3, 4, 6 tetramethoxychalcone, 5, 7-dimethoxyflavone and bonducellin.

EXPERIMENTAL

Plant material and preparation of extract

Caesalpinia pulcherrima species of family Fabaceae was collected from Bapatla

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College of Pharmacy campus, Bapatla, A. P. (Medicinal plants garden) and it was authentified. The air dried plant material was ground into powder in a mill. The crude dried powder was separately extracted with methanol; concentrated to small bulk under reduced pressure at 50ºC. It was suspended in water and the pH of the water was adjusted to neutral.

Test for microorganisms

Four clinical strains were used in the study methicillin- resistant *Staphylococcus aureus* multi drug resistant *Psuedomonas aeruginosa* (i. e. resistant to ampicillin, cefuroxine, cefotaxime, gentamicin, amikacin, erythromycin, clindamycin, ofloxacin, nalidixic acid, norfloxacin, ciprofloxacin and amoxicillin clavulanic acid *Staphylococcus epidermidis* and *Klebsilla pneumonia*. A standard ciprofloxacin solution 2 µg/mL was also tested.

Antibacterial activity

Antibacterial activity was determined by the Agar cup plate method. Petriplates containing 20 mL of nutrient agar medium (pH 7.2-7.4) were seeded with a 24h culture of the bacterial strains. Wells 8 mm diameter was cut into the agar and 50 µL of the plant extracts were tested in a concentration of 100 mg/mL, which were dissolved in DMSO. The inoculum size was adjusted so as to deliver a final inoculum of approximately 108 colony forming units (CFU/mL). Incubation was performed at 37ºC for 24h. Assessment of antibacterial activity was based on measurement of diameter of inhibition zone formed around the well.

RESULTS AND DISCUSSION

The results of antibacterial activity of the methanolic extract of root of *Caesalpinia pulcherrima* is given in Table 1.

Table 1. Antibacterial activity of methanolic extract of roots *Caesalpinia pulcherrima* on different bacteria

Treatment	Concentration µg/mL	Zone of inhibition (mm)			
		S. Aureus	***S. Epidermidis***	***P. Aeruginosa***	***K. Pneumoniae***
Standard Ciprofloxacin	2	29	30	30	30

Treatment	Concentration µg/mL	Zone of inhibition (mm)			
		S. Aureus	***S. Epider midis***	***P. Aeruginosa***	***K. Pneumoniae***
Caesalpinia pulcherrima root methanolic extract	75	19	18	20	19
	150	22	21	21	20
	225	23	22	25	27

The maximum zone of inhibition (27 mm) was observed in 225 µg/mL concentration against *Klebsilla pneumonia,* while the minimum zone of inhibition (18 mm) was observed in 75 µg/mL concentration against *Staphylococcus epidermidis*.

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