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Study Effect of Leaf Extract of Meizotropis Pellita in Comparison with Antibiotic against Bacteria

Neelam Rani[1], Sanjeev Sharma[2] and Mukta Sharma[3]

[1]Ansal University Gurgaon
[3]SBB Dental College Ghaziabad
[3]Ansal University Gurgaon
E-mail: [1]neelamlohiya@gmail.com, [2]sanjeevsharma@ansaluniversity.edu.in
[3]muktavats@yahoo.com

Abstract—*Methanolic extract of leaves of Meizotropis pellita were tested for antimicrobial activities by Agar well diffusion method and compared with Amoxicillin and Cefixime as standard antibiotic. The result revealed that the plant extracts more active against gram-positive bacteria (Staphylococcus aureus) than against gram-native bacteria (Escherichia coli); hence these plant extracts can be vitally used in treating various diseases caused by these pathogens.*

Keywords*: Plant extract, Meizotropis pellita, Amoxycillin, cefixime , Agar well diffusion method.*

1. INTRODUCTION

The multidrug resistance in pathogenic microbial species has restricted the use of conventional antibiotics. [1] This indicates the need of new antimicrobial agents from a new source. In this regard, medicinal plants play an important role in the discovery of a new drug since the time immemorial.[2] Isolation of antibacterial compounds from these natural and untapped resources is still in progress. Meizotropis pellita an angiosperm, belong to the family Fabaceae. This plant is a shrub with stout, woody perennial rootstock, from which several shoots erect up to 6 feet high and 0.75 inch diameter and are annually produced. It is commonly known as Patwa and is basically found in Patwadanger (Nainital District). It is an endangered plant and a lot of initiatives are in progress for the conservation of this plant. [3] The objective of the present study was the comparative study of the antimicrobial activity of methanolic extract of meizotropis pellita leaves with standard antibiotics amoxicillin and cefixime againt selected pathogens at a particular concentration.

2. MATERIAL AND METHODS

The fresh leaves of Meizotropis pellita (endangered plant) was collected from Patwadanger , Nainital in the end of july . The leaves were washed with running water and then with distilled water. The plant material was dried in shade dried for a couple of days and then dried in incubator at 370 C for 2-3 days. The dried leaves then crushed in mechanical grinder till it becomes a fine powder and then it was stored in air tight container at room temperature.

3. PREPARATION OF PLANT EXTRACT

The methanolic extract of the plant material were prepared by using cold maceration method. [4] 100 gm of plant material were weighed in sterile bottle, the weighed plant material was then extracted with the solvent separately in tightly covered bottles and left for 2 days at room temperature. The resultant suspensions were then filtered into sterile beakers and the filterate was refiltered using whatman filter paper no. 1 into sterile sample bottles. The extract was then concentrated and evaporated on a rotary evaporator and stored in refrigerator for further use.

4. PHYTOCHEMICAL SCREENING

The methanolic extract of Meizotropis pellita was subjected to phytochemical screening for the presence of various compounds like flavonoids, alkaloids, saponins ,tannins and steroids. [5]

5. MICROORGANISMS USED

Bacterial Strains were obtained from Microbial type Culture Collection (MTCC) and department of microbiology Shri Bankey Bihari Dental College and Research centre, Masuri, Ghaziabad. These includes three gram's positive bacterial species Bacillus subtilis (MTCC 441), Staphylococcus aureus (MTCC 96), Streptococcus pyogenes (MTCC 442) and three gram's negative species Pseudomonas aeruginosa (MTCC 424), Escherichia coli (MTCC 433) and Klebsiella pneumoniae (MTCC 1320)

6. ANTIMICROBIAL ACTIVITY

The Gram's positive and Gram's negative bacterial species were pre-cultured overnight in nutrient broth on a rotary shaker at 370 C and centrifuged at 10,000 rpm for 5 minutes. Antimicrobial activity was tested against mentioned three Gram's positive and three Gram's negative bacterial strains, the testing was done by the modified agar well diffusion method. [6-7] Muller Hinton agar (HiMedia Mumbai) was prepared as per the instructions by the manufacturer, once the media solidified then it was then inoculated with bacterial species. The media was then punched with 6 mm diameter hole and was filled with extract and control. DMSO was used as a negative control. The experiment was performed at different concentrations of the extracts (50 – 3.12mg/ml). The test was carried out in triplicates to eliminate any error. The petridishes were incubated for 370 C. The microbial growth was determined by measuring the diameter of zone of inhibition in millimeters around the well.

7. RESULT & DISCUSSION

The activity of methanolic extracts of the leaves for selected bacteria is presented in table 1. The results indicated that the crude extracts of the plant leaves exhibited variable degrees of antimicrobial activity against the gram-positive and gram-negative bacteria.

Table 1: Antimicrobial activity of Methanolic Extract of Meizotropis pellita against some Gram's positive and Gram's negative bacteria.

Conc. of Extract (mg/ml)	Mean diameter zone of inhibition (mm)					
	S.aureus	S. pyogenes	B.subtilis	P.aeruginosa	K.pneumoniae	E.coli
50	20	22	17	20	16	14
25	18	20	14	20	14	12
12.5	15	17	12	16	13	NA
6.25	12	12	10	9	8	NA
3.12	10	10	NA	10	NA	NA

The Methanolic extracts inhibition the bacteria with zone inhibition ranged (from 10 to 22) mm at different concentrations was compared to amoxicillin and cefixime with zone of inhibition (from 23 to 30) mm at a particular concentration.

Table 2: Comparision of antimicrobial afficacy of methanolic extract with selected Antibiotics

Conc. 6.25 mg/ml	Mean diameter zone of inhibition (mm)					
	S.aureus	S. pyogenes	B.subtilis	P.aeruginosa	K. pneumonae	E.coli
Crude Extract	12	12	10	9	8	NA
Amoxycillin	24	28	22	21	23	16
Cefixime	20	24	21	17	21	18

8. CONCLUSION

From the results it was concluded that crude extract shows has high antibacterial activity against S.aureus and S.pyogens and do not show any activity against E. coli . In general the activities against test bacterial culture used have shown good activity when compared with amoxicillin and cefixime as standard antibiotics. The data express that extracts of meizotropis pellita leaves has a great potential as antibacterial compounds against microorganism. Thus, it can be used in treatment of infectious caused by resistant microorganisms.

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