Antibacterial Activity of Cassia Occidentalis LINN.

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Abstract **- Medicinal properties of plants make them potent to prevent or cure diseases. Cassia occidentalis Linn. is an important member of plant family Leguminaceae commonly known as kasundi in hindi, coffee senna in English. Hexane, acetone and aqueous extracts of the plant of Cassia occidentalis were investigated for antibacterial activity against Escherichia coli, Klebsiella pneumonia, Proteus mirabilis, Pseudomonas aeruginosa and Staphylococcus aureus. The maximum zone of inhibition was observed in Proteus mirabilis in Acetone extract and minimum zone of inhibition was observed in Pseudomonas aeruginosa in aqueous extract.**

Index Terms **- Cassia occidentalis, antibacterial activity, hexane**

I.INTRODUCTION

Cassia occidentalis Linn. usually grows in the southern part of India, which is known as Kasmard in Sanskrit, Kasondi in Hindi, Ponnavarai in Tamil. and Coffee Senna in English. The plant belongs to Caesalpiniaceae family. The roots, leaves and seeds are the parts of the plant used. It is an erect herb, commonly found by roadsides, ditches and waste dumping sites. Cassia occidentalis has been widely used as traditional medicine. Entire parts of the plant have medicinal values [1]. This plant is also used to cure sore eyes, hematuria, rheumatism, typhoid, asthma, disorder of hemoglobin, leprosy [2]. The seeds are brewed into a coffee like beverage for asthma, malaria, fevers, and stomach complaint.

Plants have been used as a traditional medicine and pharmacopoeial drugs from ancient times. Most of world's population is depend on plant due its medicinal value and scarcity [3,4]. Medicinal plants have been used for the treatment of illness since ancient period [5]. Numerous plant-derived therapeutic agents for the modern medicine have been provided by medicinal plants [6,7]. Although in traditional medicine Cassia species have been well known for their laxative and purgative properties and for the treatment of skin diseases [8]. Cassia occidentalis Linn. has been used as a folklore medicine for hepatotoxicity treatment [9]. There is now an increasing body of scientific evidence demonstrating that the plants possess many other beneficial properties.

In recent years, increasing strains of microorganisms throughout the World have developed resistance to large number of antibiotics that has created immense clinical problem and made the management of infectious diseases quite complicated [10]. The way to avoid antibiotic resistance of pathogenic species is by using plant-based compounds rather than existing synthetic antibacterial agents [11]. The present study is aimed to analyze the antibacterial activity of the plant Cassia occidentalis.

II.MATERIALS AND METHODS

A. Collection and preparation of plant material:

The plants of Cassia occidentalis collected from local areas of Nagercoil were shade dried and broken into coarse material. The powder was subjected to extraction using Soxhlet apparatus with acetone,

hexane and aqueous. The three extracts were concentrated into paste consistency. From each extract 300 mg was dissolved in 10 ml of Dimethyl Sulphoxide (DMSO) and stored in airtight containers.

B. Bacterial strains

In the present study five human pathogenic pathogens were used namely Ecoil (MTCC 1687), Staphylococcus aureus (MTCC 737), Pseudomonas aeruginosa (MTCC 1688), Klebsiella pneumonia (MTCC 7162) and Proteus mirbilis (MTCC 3310) obtained from MTCC Chandigarh. Stock culture were maintained in nutrient agar medium at 40^0c, then subcultured in nutrient broth at 37^0c prior to each microbial test.

C. Disc diffusion method

The disc diffusion method was used to screen the antibacterial activity [12]. The sensitivity test of the chloroform, N-butanol and aqueous extract were determined using agar-disc diffusion method. Media were prepared using Muller Hinton Agar poured in petridishes and inoculated with test organisms from the broth using cotton swabs. Disc impregnated with the plant extract were placed on the swabbed plate. The plates were incubated overnight at 37^0c for 24 hours. Amikacin was used as positive reference standard. After incubation, the clear zone around the disc were measured and expressed in mm as a measure of their antibacterial activity.

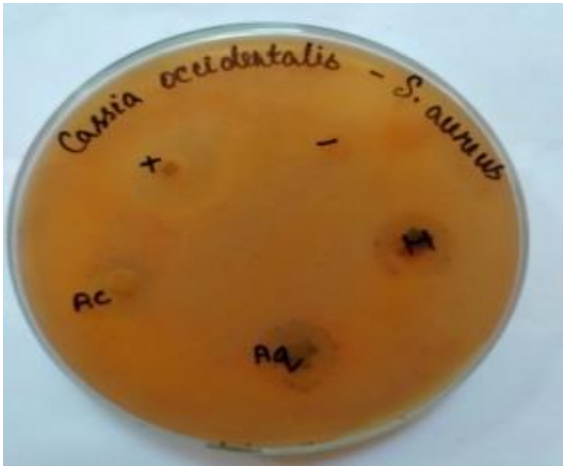
III.RESULT AND DISCUSSION

The results obtained in the study are depicted in Table 1 which showed the growth inhibition produced by the plant extracts of Cassia occidentalis on five species of bacteria. The highest activity (zone of inhibition in diameter is about 16mm) was demonstrated by the acetone extract of Cassia occidentalis plant against Proteus mirbilis while the lowest activity was 5mm by the aqueous extract against Pseudomonas aeruginosa. On the other hand, the aqueous extract were not active against Escherichia coli and Proteus mirbilis.

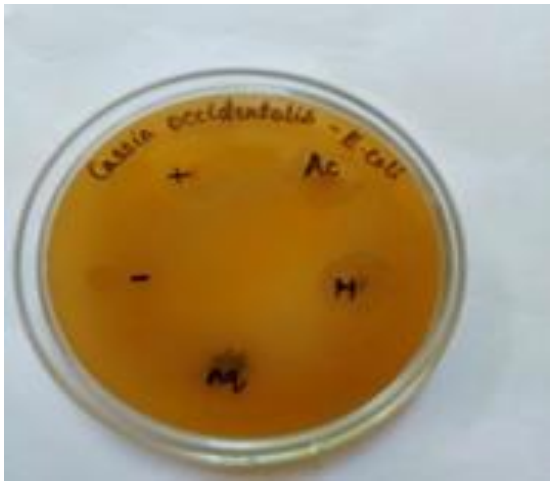
The antibacterial activity of methanol showed more active than other extracts in its antibacterial activity. The zone of inhibition exhibited by methanol extract against tested microorganisms ranged between 20.9 ± 0.21 to 23.1 ± 0.15mm, respectively [13]. All the bacterial organisms screened, the growth of Staphylococcus aureus and Escherichia coli were majorly inhibited in the methanol extract; Klebsiella pneumoniae and Staphylococcus aureus in hexane extract while Escherichia coli and Salmonella typhi in the ethylacetate extract. In the present study acetone extract showed more activity against the pathogens Ecoli, Pseudomonas aeruginosa, Klebsiella pneumoniae, and Proteus mirbilis while Staphylococcus aureus in hexane extract [14].

Table: 1 Antibacterial activity of Cassia occidentalis against bacterial pathogens

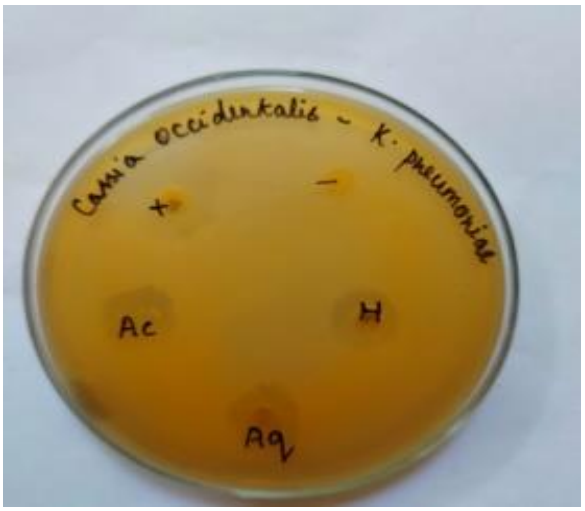
No	Bacterial Pathogens	Zone of Inhibition (mm)			
		Amikacin	Acetone	Hexane	Aqueous
1	E. coli	18mm	11mm	8mm	-
2	Staphylococcus aureus	20mm	14mm	15mm	10mm
3	Proteus mirabilis	21mm	16mm	14mm	-
4	Klebsiella pneumoniae	20mm	8mm	7mm	8mm
5	Pseudomonas aeruginosa	22mm	12mm	7mm	5mm



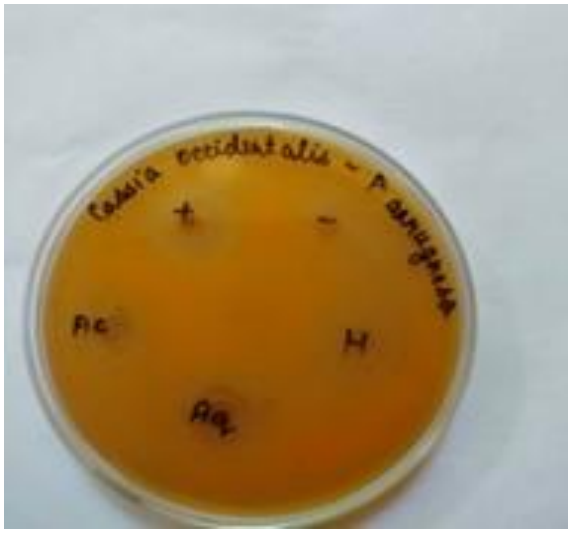
Proteus mirbilis



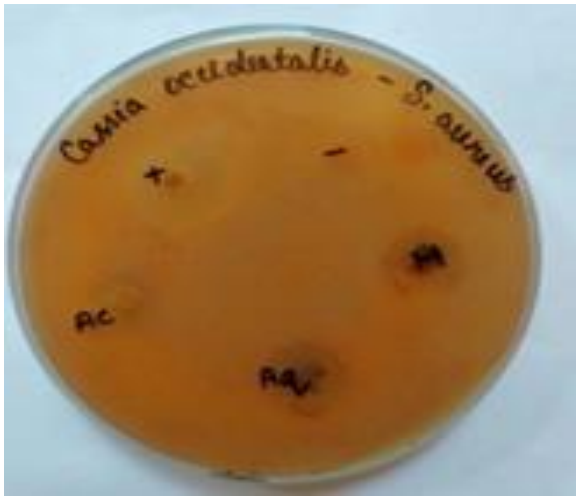
Ecoli



Klebsiella pneumonia



Pseudomonas aeruginosa



Staphylococcus aureus

Fig:1 Antibacterial activity of Cassia occidentalis using different solvent extracts

IV.CONCLUSION

The present study supports the traditional use of Cassia occidentalis and indicated that the plant contains some major bioactive compound that inhibits the growth of respiratory microorganism thereby proving very effective source of derived drugs.

V. ACKNOWLEDGEMENT

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