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COMPARITIVE STUDY ON ANTIBACTERIAL ACTIVITIES OF *CLERODENDRON INFORTUNATUM LINN* AND *CLERODENDRON PANICULATUM LINN* ROOT

EXTRACT

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ABSTRACT

The root portions of the *Clerodendron infortunatum* Linn and *Clerodendron paniculatum* linn roots were extracted with ethanol by cold maceration process. The extracts were vacuum dried and subjected to antibacterial (*Staphylococcus aureus*, *Escherichia coli*) screening by Agar disc diffusion method. Minimum Inhibitory Concentration of microbial growth were also evaluated. The phytochemical screening was performed and different phytoconstituents present in the extracts were identified. The extracts exhibited potent activity against *Staphylococcus aureus*, *Escherichia coli*. The study reveals that *Clerodendron paniculatum* possess better antibacterial activity than the other species.

INTRODUCTION

Clerodendron infortunatum Linn, *C.paniculatum* (Family :Verbenaceae)¹ is a species found in India, It is reported as folk remedy for tumours , leprosy, fever, infection, inflammation.The roots have been reported to possess laxative, diuretic, analgesic, anti inflammatory, anti tumour and antibacterial activities². To our knowledge there were no scientific reports on the antibacterial activities of *Clerodendron infortunatum* Linn root, *C.paniculatum* root .In the present study the root portions of *Clerodendron infortunatum* Linn, *C.paniculatum*were extracted with ethanol, by cold extraction. The vaccum dried extracts (25, 50 and 100mcg/mL) were screened for antibacterial activities^{3,4}. Minimum Inhibitory Concentration was also determined⁵.

MATERIALS AND METHODS

Plant Collection, Extraction, Phytochemical and screening

The plants *C.infortunatum*, *C.paniculatum* was collected from Pathanamthitta district of Kerala and identified by Thomas Mathew, HOD of Botany, Marthoma College Tiruvalla, Kerala .Voucher no. VSCI-13,VSCP14 were deposited in the Pharmacognosy department, Pushpagiri College of pharmacy, Tiruvalla. The root portion of the plants were washed with running water to remove soil and other matter and dried in shade for 20 days, powdered, extracted 500gm each with ethanol (EECI,EECP) by cold extraction to yield the respective extracts.The extracts were reduced to molten mass by rotary vaccum evaporator and the yield was 18%, 21% respectively.

Preliminary phytochemical screening was performed as per standard procedure and various phytochemical constituents were identified[6,7]..

Antibacterial activity

The extracts (EECI,EECP) were subjected to antibacterial (*Staphylococcus aureus*, *Escherichia coli*) screening .The antibacterial screening was done by Agar diffusion method using a paper disc[3,4]

Nutrient agar and Saubraud dextrose agar media were used for antibacterial screening. The sterilized (autoclaved at 120° for 30 mins) medium (40° - 45°) was inoculated (1mL /100mL of medium) with suspension of the micro organism (match with McFarland barium sulphate standard). The paper impregnated with the extracts (25,50,100mcg/MI in dimethyl sulphoxide)was placed on the solidified medium .The plates were pre inoculated for 1 h at room temperature and incubated at 37°C for 24 and 48h for antibacterial activity determination.

Ciprofloxacin (5mcg/disc) was used as standard for antibacterial activity. The observed zones of inhibition are presented in table 1 and fig no 1.The MIC for the above organism was found by Agar streak dilution method⁵. About 20ml of the media containing concentrations of the extracts was poured into each sterile petridish and allowed to solidify Microorganisms were then streaked one by one on the agar plate aseptically. After streaking all the plates were incubated at 37°C for 24 h .Then the plates were observed for the growth of micro organisms.The lowest concentration of the plant extracts required for inhibiting the growth was considered as the MIC of the extracts against bacterial strains.

RESULT AND DISCUSSION

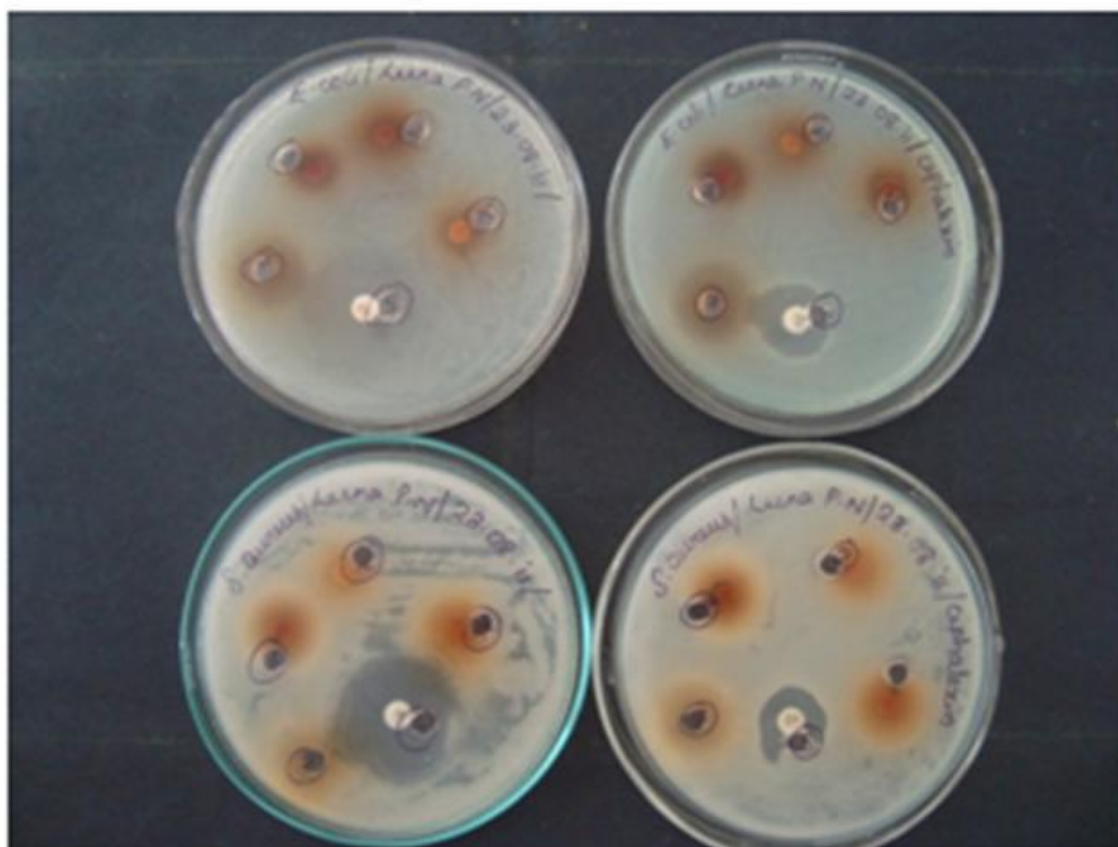
The preliminary phytochemical screening carried out on *Clerodendron infortunatum*Linn,*Clerodendron paniculatum* Linn root indicated the presence of carbohydrates, starch, mucilage, saponins, flavanoids, tannins, phenolic compounds in the ethanol extract.**Table 1** .The antibacterial activities of the extracts were determined by measuring the zone of inhibition produced by the extracts against tested organisms at different concentration. All the extracts exhibited marked activities against the tested organisms. E.coli was more sensitive towards the extract at 100mcg indicated by a greater degree of inhibition on comparison with standard as evident from Table1. From the results reveals that the drug *Clerodendron paniculatum* Linn root extract possess a better antibacterial drug with a minimum of adverse effects than *Clerodendron infortunatum* Linn root. Zone of Inhibition(inmm) and Minimum Inhibitory Concentration (MIC) of *Clerodendron infortunatum* Linn, *Clerodendron paniculatum* Linn root extract against the tested micro organisms were vide **Table 2**.

Table 1: Zone of Inhibition(in mm) and Minimum Inhibitory Concentration (MIC) of *Clerodendron infortunatum* Linn, *Clerodendron paniculatum* Linn root extract.

ORGANISM	EXTRACT	STANDARD {Ciprofloxacin} (5mcg/disc) in mm	25mcg	50mcg	100mcg	MIC
<i>Staphylococcus aureus</i> Strain no. NCIM-2079	EECI	46	16	21	23	21
	EECP	46	16	20	20	21
<i>Escherichia coli</i> Strain no. NCIM-2065	EECI	33	16	18	23	20
	EECP	33	15	18	25	21

EECI: Ethanol extract of *Clerodendron infortunatum* Linn root,EECP Ethanol extract of *Clerodendron paniculatum* Linn root

Figure 1: Zone of Inhibition(in mm)



CONCLUSION

The preliminary phytochemical screening carried out on *Clerodendron infortunatum* Linn, *Clerodendron paniculatum* Linn root indicated the presence of carbohydrates, starch, mucilage, saponins, flavanoids, tannins, phenolic compounds in the ethanol extract. The antibacterial activities of the extracts were determined by measuring the zone of inhibition produced by the extracts against tested organisms at different concentration. All the organisms exhibited moderate activity against the extract exhibited marked activities against the tested organisms. E.coli was more sensitive towards the extract at 100mcg indicated by a greater degree of inhibition on comparison with standard.

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