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## **Evaluation of antibacterial activity on *Cayratia Carnosa* Gagnep**

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### **ABSTRACT**

Present investigation deals with antimicrobial activity of a medicinal plant *Cayratia carnos* gagnep against three Gram positive bacteria viz., *Bacillus subtilis*, *Staphylococcus aureus*, *Micrococcus aureus* and Gram negative bacteria viz., *Pseudomonas aeruginosa*, *Escherichia coli* and *Klebsiella pneumonia*. The zone of inhibition of various extracts for the whole plant like petroleum ether, ethyl acetate, chloroform and ethanol extract was determined and were compared with standard gentamycin (1mg/ml). The antibacterial activity, justifies its use in traditional medicine. The alcoholic extract was found to have significant antimicrobial potency, when compared with other extracts but less than that of standard gentamycin.

**KeyWords:** Antimicrobial, Gram positive bacteria, Gram negative bacteria, *Cayratia carnos*, gentamycin.

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### **INTRODUCTION**

Many commercially proven drugs used in modern medicines, were initially used in crude form in traditional or folk healing practices or for other purposes that suggested potentially useful biological activity [1]. Many kinds of diseases have been treated with herbal medications through out the history of mankind. Antibacterial agents are chemicals that either kill the microorganism (or) inhibit their growth. Microorganisms are the causative agents of almost all kinds of acute and chronic diseases. Plant based antimicrobials have enormous therapeutic potential [2].

*Cayratia carnos* gagnep a traditional medicinal herb belonging to the family Vitaceae found through out the hotter parts of India, it is native to Asian tropics from India and Sri Lanka to Southern China and Malaysia.

Ethnomedical review of the plants revealed that the entire plant showed astringent and diuretic activity. It purifies the blood and was given for cardiac disorders, ulcers and wounds.[3]. The plant had been reported to have cytotoxic properties.[4].

As the plant had varied medicinal properties. So the present work had been undertaken to analyse the antibacterial properties of various extract such as petroleum ether, ethylacetate, chloroform and ethanol on entire plant of *Cayratia carnos*.

## EXPERIMENTAL SECTION

### Collection of Plant Materials

The plant was collected from the Rayirath Medicinal Garden, Thrissur. It was identified (No: BSI/SRC/S/23/10-11/TEC 124) and authenticated by Botanical survey of India, Coimbatore.

### Preparation of Extract

The whole plant was then air dried, powdered and extracted by using soxhlet apparatus [5] or 48 hrs successively with petroleum ether, ethyl acetate, chloroform and ethanol. The solvent was then concentrated under vacuum at 60°C and the extracts were tested for Antibacterial activity.

### Cup-plate method

Antibacterial screening was done by using Cup- plate method [6]. Mueller- Hinton agar plates were prepared fresh, marked and inoculated with the Gram positive bacteria viz., *Bacillus subtilis* (NCIM-2010), *Staphylococcus aureus* (NCIM-5021), *Micrococcus aureus* (NCIM-2704) and Gram negative bacteria viz., *Escherichia coli* (NCIM-2118), *Pseudomonas aeruginosa* (NCIM-5029) and *Klebsiella pneumoniae* (NCIM-2719). Six wells were cut in the media using a sterile cork borer .

The extracts were weighed and made up to the required concentration (200 µg/ml) using solvent Dimethyl sulphoxide (DMSO), Gentamicin (1 mg/ml) was used as the standard. The standard drug solution (10µ,l) was introduced into one of the wells using micropipette and DMSO was added in another well, which served as control. In the remaining 4 wells, extracts were filled for each organism. The test plates were then incubated at 37°C for 18-24 hrs and the average zones of inhibition were measured [7] and results were tabulated as shown in table 1.

Table:1 Antibacterial Activity of Various Extracts on *Cayratia carnos*

S.No	Strains	Zone of inhibition (in mm)					
		PE	AE	EAE	CE	STD	Control
1.	<u>Gram Positive Bacteria</u> <i>Bacillus subtilis</i>	10.33±0.33	22±0.57	12±0.57	10.66±0.33	31.33±0.66	-
2.	<i>Staphylococcus aureus</i>	12.66±0.66	25±0.57	11.66±0.88	12.33±0.88	26.66±0.88	-
3.	<i>Micrococcus aureus</i>	14.33±1.20	17.33±0.66	13.33±0.88	12.33±1.45	24.66±0.88	-
1.	<u>Gram Negative Bacteria</u> <i>Pseudomonas aeruginosa</i>	10.33±1.20	13.66±0.66	10.66±1.20	10.66±1.20	26.00±1.15	-
2.	<i>Escherichia coli</i>	20±1.20	20±0.57	11±0.33	10.33±0.33	31±0.57	-
3.	<i>Klebsiella Pneumoniae</i>	13±1.0	14.66±0.88	12.66±1.20	10.66±0.88	32±1.15	-

Values are expressed as mean ± SEM of triplicate observations. (-) denotes no activity

PE - Petroleum ether extract; AE - Alcoholic extract; EAE -Ethyl acetate extract

CE -Chloroform extract; Standard -Gentamycin; Control - Dimethyl sulphoxide

## RESULTS AND DISCUSSION

The result of antibacterial screening showed that the ethanolic extract was effective against gram positive bacteria *Staphylococcus aureus* whereas other Gram positive bacterias like *Bacillus subtilis* and *Micrococcus aureus* showed moderate activity. Ethanol extract was also effective against Gram negative bacteria, *Escherichia coli* but moderate activity against *Pseudomonas aeruginosa* and *Klebsiella pneumoniae*.

The differences in the antibacterial effect of the various extracts against gram positive and gram negative bacteria may be due to differences in permeability. In gram negative species, an outer membrane is fairly effective barriers for amphipathic compounds.

## CONCLUSION

In the present work, the antibacterial activity of *Cayratia carnosia* confirms its potential usefulness in traditional medicine for the treatment of ulcers and wounds. The antimicrobial activity can be co-related due to their specific phytoconstituents.

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