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## IN VITRO ANTI-MICROBIAL STUDIES ON THE LEAVES OF *CHASSALIA CURVIFLORA*

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### ABSTRACT

Antimicrobial is a substance that kills or inhibit the growth of microorganisms such as bacteria, fungi, or protozoas. Emerging and reemerging infection and spread of drug resistant strains of microorganisms are posing a challenge to global public health in terms of treatment. There is increasing interest in the use of plant extracts as therapeutic agent to inhibit the growth of pathogenic micro organisms. *Chassalia curviflora* is an evergreen shrub grows in tropical region and is endemic to East Asia. It has potential uses like anti hypertensive, anti bacterial and traditionally used for eye infection, ear infection and insect bites. The present study highlights the antibacterial studies of Methanolic and Aqueous extracts of leaves of *Chassalia curviflora*. The phytochemical screening of the plant extracts shows the presence of various chemical constituents such as alkaloids, phenolics, flavanoids and saponins. These may be responsible for the anti bacterial activity.

**Key Words:** *Chassalia curviflora*, antibacterial.

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### INTRODUCTION

Plants are rich source of variety of chemicals with nutritive and therapeutic properties. Plants are being in medicines from time immemorial because they have fitted the immediate personal need they are accessible and inexpensive. Plant products also be useful as starting material for the semi synthetic preparation of other drugs. Antimicrobials are agents which kills or inhibit the growth of micro organisms. The plant *Chassalia curviflora* is endemic to East Asia and it is traditionally used for eye infection, ear infection and insect bites, it also has potential antihypertensive and antibacterial activity (1).

### MATERIAL AND METHODS

#### Plant Materials

The leaves of the plant *Chassalia curviflora* [family: Rubiaceae] was collected from Kasaragod and wayanad. The leaves was dried under shade for about 7 days and then powdered with mechanical grinder and stored in an air tight container

#### Extraction

Extraction of leaves of *Chassalia curviflora* using methanol and water by soxhlation

#### Preliminary Phytochemical screening

Various chemical tests were carried out to determine the presence of various chemical constituents such as alkaloids, glycosides, terpenoids, sterols etc (2-6).

#### In-Vitro Antibacterial activity study by Disc Diffusion Method (7)

Antibacterial activity of tested plants parts was carried out by the disc diffusion method. First, the different extracts of plant parts tested were dissolved in DMSO at a concentration of 100 mg/mL and filtered through 0.45 µm sterile filter membranes. Then, 100 µL of bacterial inoculums were spread over plates

containing Mueller Hinton agar, and discs (6 mm in diameter) impregnated with 10 µL of the extracts solutions (1 mg/disc) were placed on the surface of the media. Two control discs were used containing DMSO and Ciprofloxacin (10 µg/ disc) as negative and positive controls, respectively. The plates were incubated for 24 h at 37 °C, and the experiments were performed in duplicate. The diameters of inhibition

zones were measured and antibacterial activity was considered for diameters of inhibition zone greater than 9 mm. The antimicrobial activity was tested against one gram-positive organism namely *Staphylococcus aureus* and one gram-negative Organism namely *Escherichia coli*<sup>7</sup>.

## RESULTS AND DISCUSSION

### Extraction

Powdered leaf was extracted by soxhlation using methanol and water as solvent. The characteristics of extracts are shown in Table-1.

**Table-1 Extract characteristics**

S No	Solvents used for extraction	Colour	Consistency	Percentage yield (%w/w)
1	Methanol	Yellowish black	Dry mass	3.53
2	Aqueous	Brown	Dry mass	15.37

### Preliminary Phytochemical screening

Various chemical tests were carried out to determine the presence of various chemical constituents and results are given in table-2.

**Table-2 Preliminary phytochemical screening of Methanolic and Aqueous extracts**

S No	Phytoconstituents	Methanol	Aqueous
1	Alkaloids	+	+
2	Glycosides	-	+
3	Phenolic compounds	+	+
4	Flavonoids	+	+
5	Carbohydrates	+	+
6	Proteins	+	-
7	Terpenoids	+	+
8	Saponins	+	+

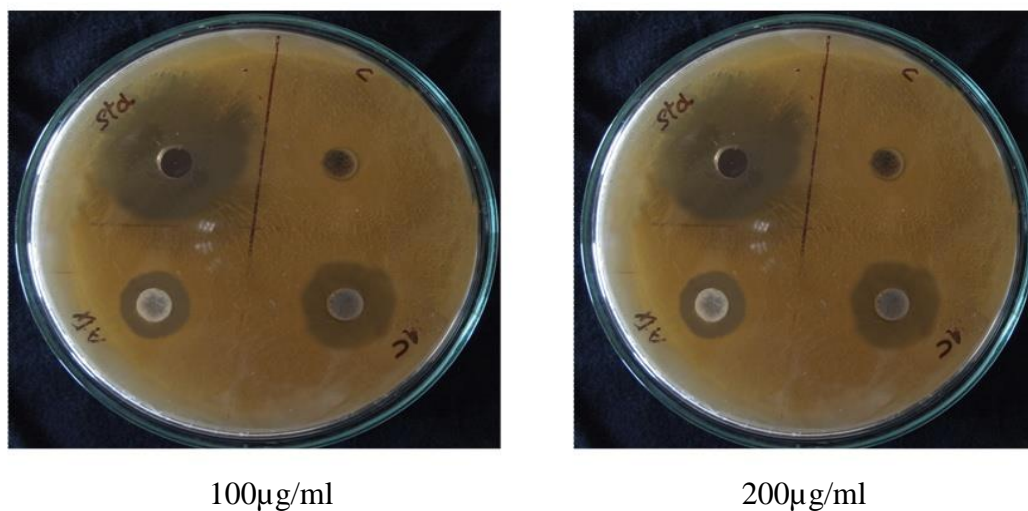
### Anti- Microbial Studies

Anti bacterial activity of both Aqueous and Alcoholic extract was determined by Agar well diffusion method using different bacterial strains, Alcoholic extract shows significant antibacterial properties. The results are shown in table-3 and Fig-1 and 2.

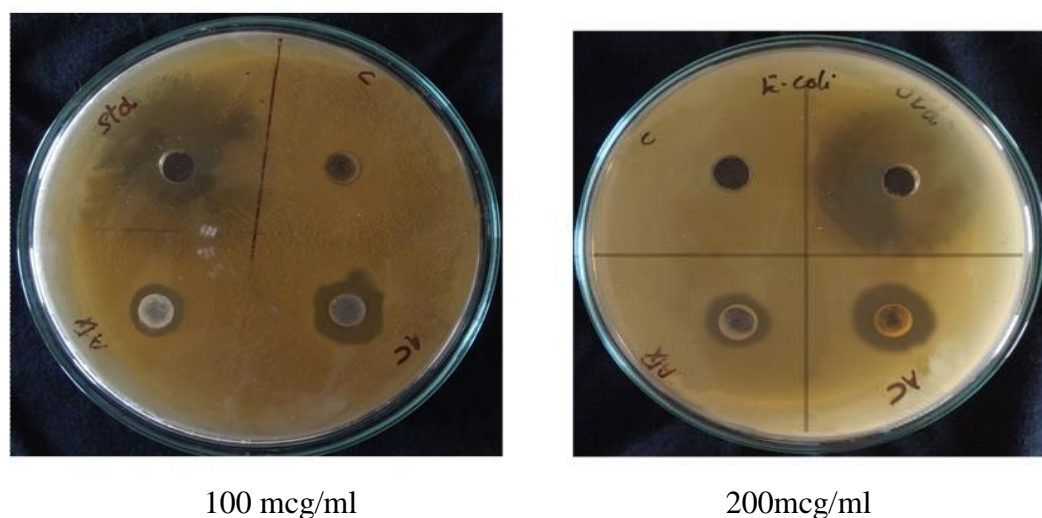
**Table-3 Zone of inhibition of methanolic and aqueous extract against *Staphylococcus aureus* and *Escherichia coli***

S No	Diameter of zone of inhibition in mm						
	Extracts	<i>Staphylococcus aureus</i>			<i>Escherichia coli</i>		
		100µg/ml	200µg/ml	Standard 100µg/ml	100µg/ml	200µg/ml	Standard 100µg/ml
1	Alcohol	19	21	30	14	16	25
2	Aqueous	14	18	26	17	19	22

(-) Indicates no zone of inhibition, Diameter of zone of inhibition in mm: (17mm & above: sensitive, 13-16mm: moderately sensitive, less than 12mm: resistant).



**Fig - 1** Zone of inhibition of gram positive bacterial strains (*Staphylococcus aureus*)



**Fig-2** Zone of inhibition of gram negative bacterial strains (*Escherichia coli*)

## CONCLUSION

The plant *Chassalia curviflora* is endemic to East Asia and it is traditionally used for eye infection, ear infection and insect bites, it also has potential antihypertensive and antibacterial activity. The leaves of the plant *Chassalia curviflora* was collected, dried and subjected to extraction by soxhlation. Phtochemical screening and pharmacological studies of Methanolic and Aqueous extracts were carried out. From the antibacterial study it is concluded that alcoholic extract shows significant activity against both gram positive and gram negative micro

organisms. The presence of chemical constituents such as alkaloids, phenolics, flavanoids and saponins may be responsible for the anti bacterial activity.

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