ANTIBACTERIAL ACTIVITY OF LEAVES OF *CANTHIUM PARVIFLORUM* FROM KANYAKUMARI USING ETHYL ACETATE AS SOLVENT

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ABSTRACT

Medicinal plants are known to responsible for the cure of many diseases and infections due to the presence of bioactive compounds produced in it. In the present study, the leaves of *Canthium parviflorum* was tested for antimicrobial activity using ethyl acetate as solvent. Extracts of *Canthium parviflorum* exhibited a remarkable activity against gram positive bacteria. Thus it have proved that it must be a potential plant for the isolation of bioactive compounds. The bioactive compounds in the plants are alkaloids, tannins, flavonoids, terpenoids. They can act as defence mechanism and protect the plants from various bacterial attack. They can also act as the attractants and responsible for the sexual reproduction of plants. The various compounds which are responsible for the defence mechanism are known as secondary metabolites. They are named so because it further originated from primary metabolites.

Key word: *Canthium parviflorum*, ethyl acetate, antimicrobial activity.

INTRODUCTION

Many drugs preferred in the world for diseases is of herbal nature. Those are extracted from plant source or chemically synthesized as a natural product (Sirigiri Chandra Kala**., 2015)**. A good method to learn about drugs and their mechanisms leads to use of drug actions(Sirigiri Chandra Kala**., 2015**. Nowadays, a large interest is made on drug mechanism at molecular level has been developed and there are lot of evidences supporting the drug action(Sirigiri Chandra Kala**., 2014).**

Canthium parviflorum belongs to the family Rubiaceae which is a thorny shrub plant. Rubiaceae species is of very importance source of secondary metabolites for medication purposes. On various reports it is clear that this plant material is used for anthelmintic, antidysenteric, antispasmodic and as a diuretic (Sirigiri Chandra Kala**., 2015).** The leaves and roots are used to cure fever and constipation **(**Kirtikar KR, Basu BD *etal*, 2001).

The leaf of *Canthium parviflorum* also possess wound healing property. The paste of leaf is applied for scabies and ringworm infection (Anitha Roy etal, 2011). They are also used as an medicine for diabetes in tribal areas, tamilnadu (Ayyanar M et al, 2008).

The roots of this plant are traditionally used by the tribes of Orissa in the treatment of swelling of neck. The roots are astringent, sweet, thermogenic, diuretic, febrifuge, constipating, anthelmintic, and tonic. They are used in vitiated conditions of kapha, diarrhoea, strangury, fever, leucorrhoea, intestinal worms, and general debility(Warrier PK, 1994, Wealth of India, 1992).

MATERIALS AND METHODS

Antibacterial assay by agar well diffusion method

Plant sample from Kanyakumari were extracted and assessed in Well diffusion method to check the Minimum Inhibition Concentration (MIC) against pathogens.

Sample preparation

10mg of the sample extracts (Ethyl acetate) dissolved in 1 mL DMSO (Dimethyl sulfoxide) respectively and sample was prepared 100µg, 200µg, 300µg, and 400µg by pipetting 10µL, 20µL, 30µL,40µL and the final volume was made upto 50µL by adding deionized water.

Test organism

24hr cultured Gram-positive bacteria- *Bacillus cereus, Staphylococcus aureus, Streptococcus mutans, Enterococcus faecalis and Staphylococcus epidermis*.

Gram negative bacteria - *Pseudomonas aeruginosa, Escherichia coli, Salmonella typhi, Klebsiella and Serratia marcescens*.

Media preparation

Luria Bertani (LB) agar (tryptone 10g, sodium chloride 10g, yeast extract 6g, agar 20g

and distilled water 1000mL) was prepared and autoclaved at 121°C for 15mins.

Plate preparation

Approximately 25mL of the media was poured into the sterilized petriplates and allowed

it to solidify, later 24hrs cultured 100µL inoculum ofBacillus cereus, Staphylococcus aureus,

Streptococcus mutans, E-faecalis, Staphylococcus epidermis, Pseudomonas aeruginosa, E-coli,Salmonella typhi, Klebsiella and Serratia marcescensadded into the respective plates and

spreaded throughout the plate using plate spreader. Five wells are made using well borer and thesample containing 100µg, 200µg, 300µg, and 400µg are loaded into the respective wells and50µL of deionized water loaded in the center well as control blank and incubated at 37°C for 24hrs.

RESULTS

Plant sample from Kanyakumari

MIC of Ethyl acetate extract against pathogens

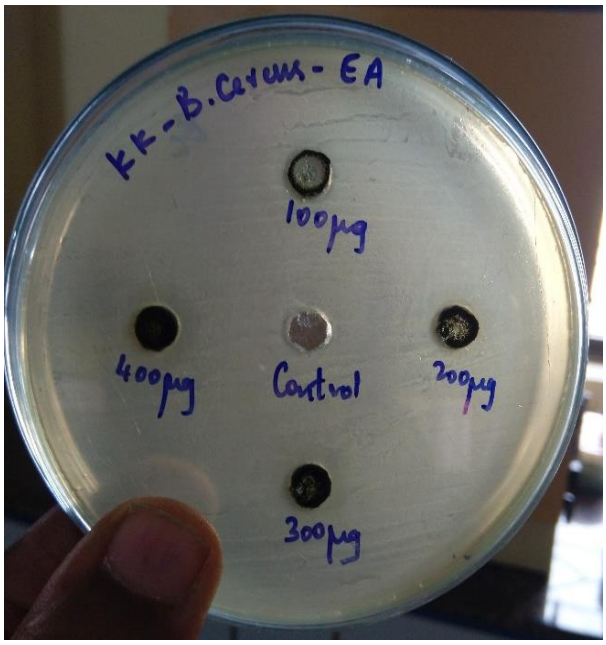


Fig: MIC plate of *Bacillus cereus*

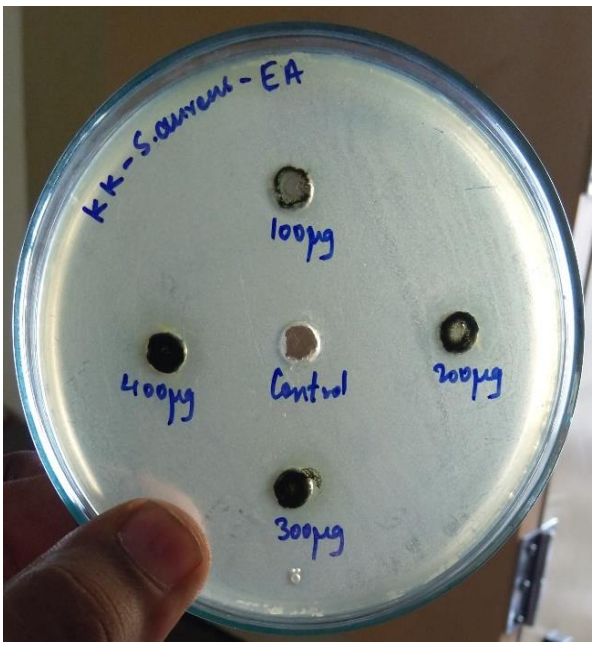
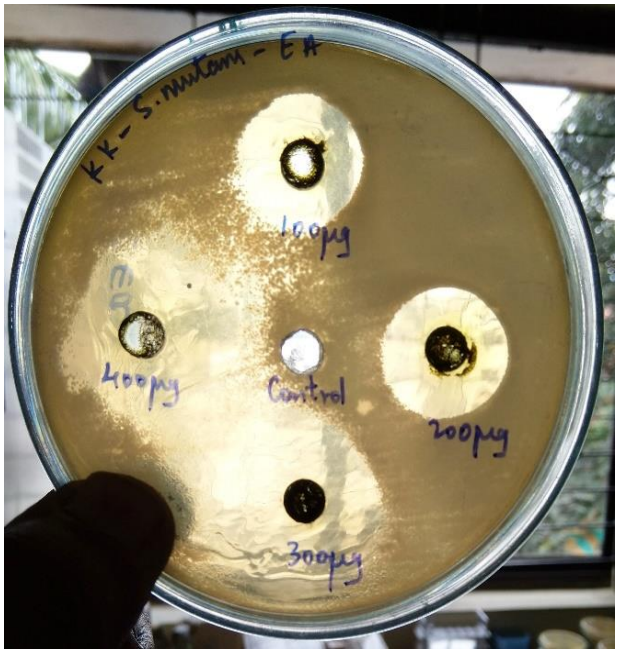


Fig: MIC plate of *Staphylococcus aureus*



MIC plate of *Streptococcus mutans*

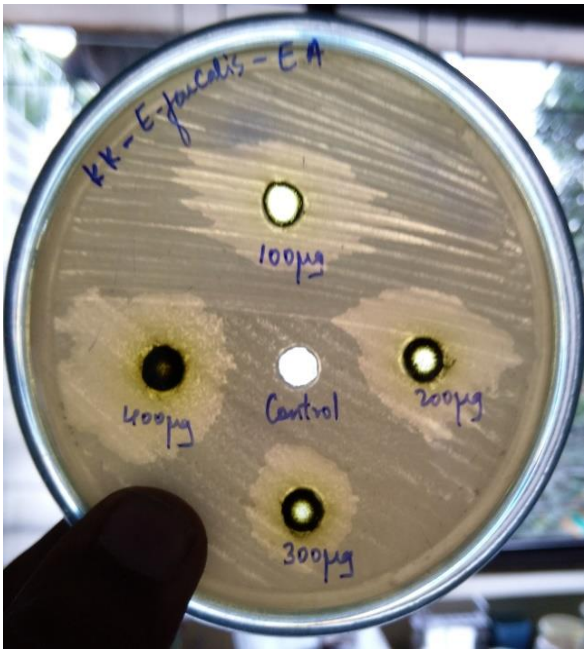


Fig: MIC plate of *E-faecalis*

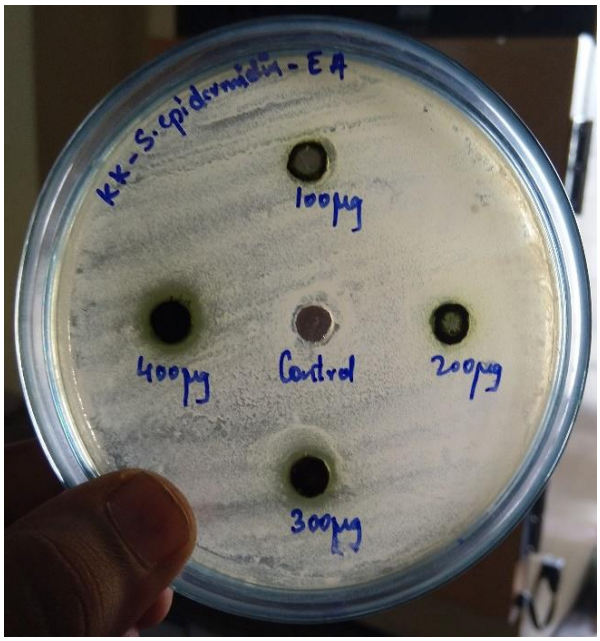


Fig: MIC plate of *Staphylococcus epidermidis*

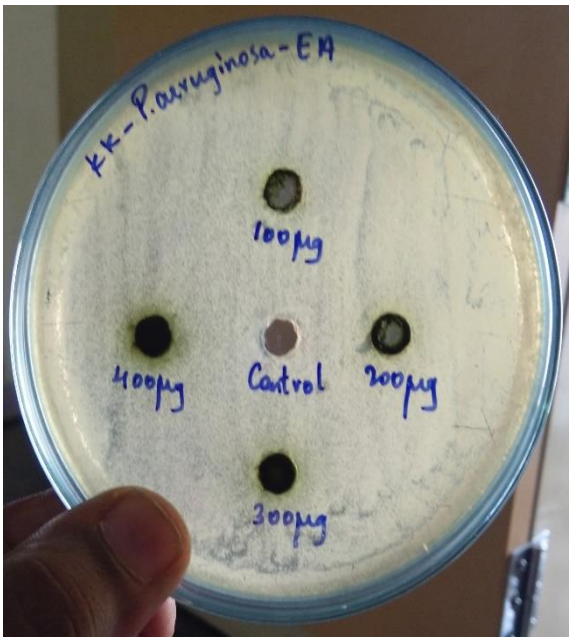


Fig: MIC plate of *P. aeruginosa*

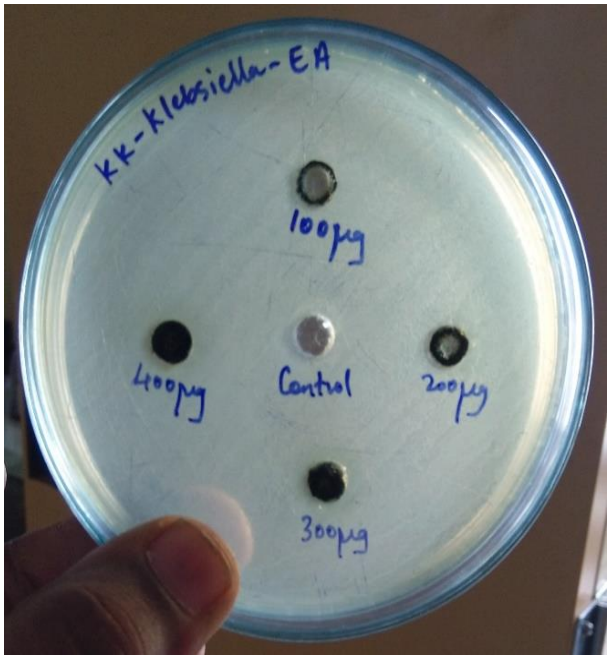


Fig: MIC plate of *E-coli*

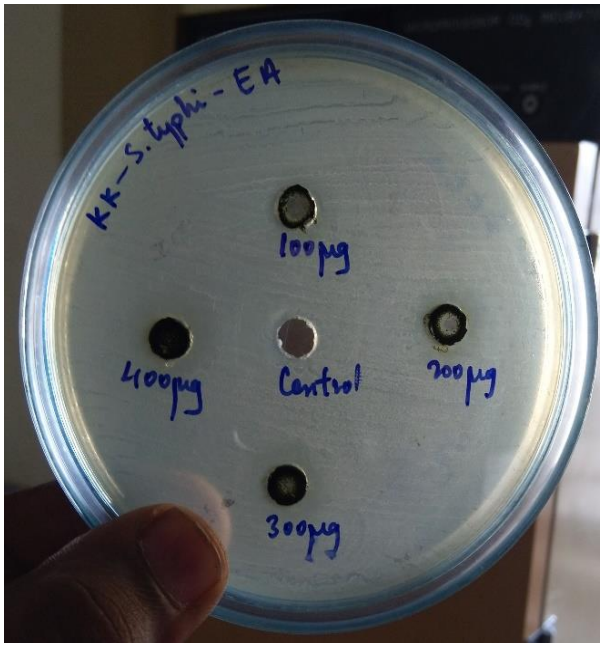


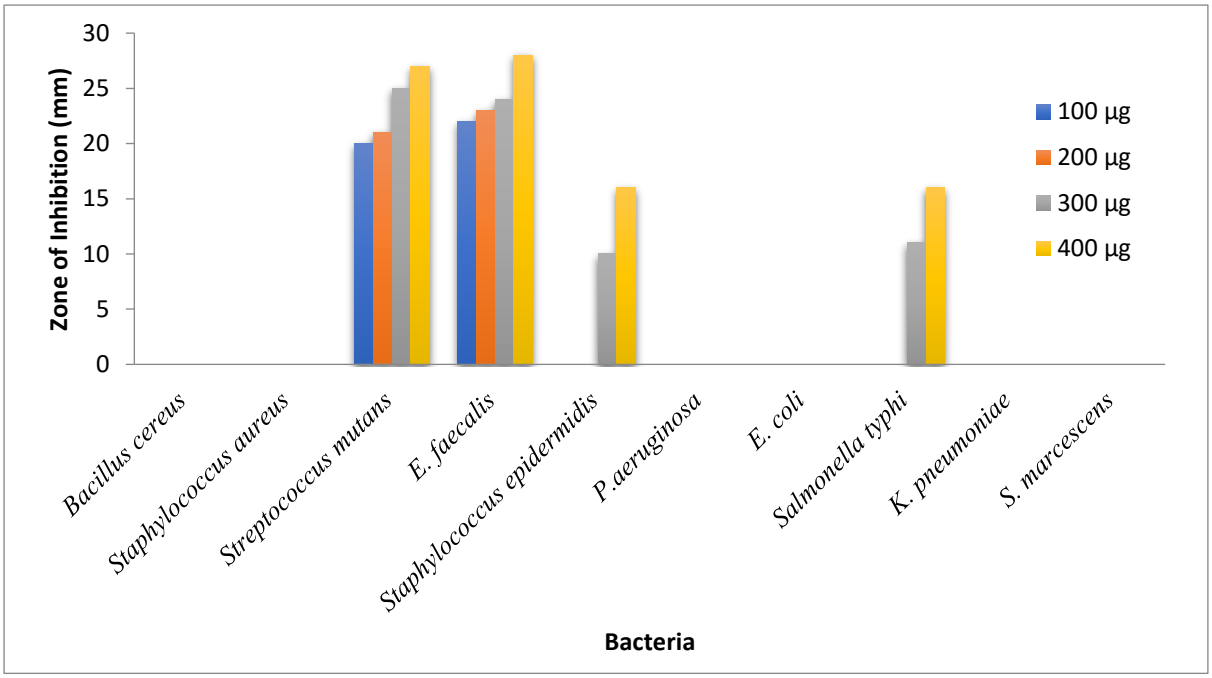
Fig: MIC plate of *Salmonella typhi*

Fig: MIC plate of *K. pneumonia*

Fig: MIC plate of *S. marcescens*

Table - Antibacterial activity of Ethyl acetate extract against pathogens

Organism	Zone of Inhibition in Mm for Ethyl acetate extract in µg											
	100 µg			200 µg			300 µg			400 µg		
Bacillus cereus	-	-	-	-	-	-	-	-	-	-	-	-
Staphylococcus aureus	-	-	-	-	-	-	-	-	-	-	-	-
Streptococcus mutans	20	20	20	21	21	20	24	24	25	26	26	27
E-faecalis	22	22	23	23	23	21	23	24	24	28	28	26
Staphylococcus epidermidis	-	-	-	-	-	-	10	10	10	16	15	15
P.aeruginosa	-	-	-	-	-	-	-	-	-	-	-	-
E-coli	-	-	-	-	-	-	-	-	-	-	-	-
Salmonella typhi	-	-	-	-	-	-	11	11	11	15	15	16
K. pneumoniae	-	-	-	-	-	-	-	-	-	-	-	-
S. marcescens	-	-	-	-	-	-	-	-	-	-	-	-



Discussion

Antimicrobial activity of medicinal plants are continuously found out from various part of the world. The world health organisation concluded that the total world population of 80% use extracts of plant as traditional therapies. In the present work, the extracts from *Canthium*

Parviflorum show strong activity against gram positive bacteria. In this screening work, extracts act as inactive against most most gram-negative bacteria. The result of present investigation showed that the plant contains more or less same components like saponin, triterpenoids, steroids, glycosides, anthraquinone, flavonoids, proteins, amino acids, tannin and phenolic compounds have been shown to posses antimicrobial activities against a number of microorganisms.

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