World Journal of Pharmaceutical Sciences
ISSN (Print): 2321-3310; ISSN (Online): 2321-3086
Available online at: http://www.wjpsonline.org/
Original Article

A study on in-vitro antimicrobial activity of Pure Milky Latex of Calotropis Procera

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Received: 26-06-2019 / Revised Accepted: 25-09-2019 / Published: 01-10-2019

ABSTRACT

Different plants are used as medicinal purposes for long time. The folk and traditional medicinal system uses the plant material for the treatment of various diseases. It has been proved that plants are one of the major sources of drug discovery and development. Plants are reported to have anticancer, antimicrobial, anti diabetic, anti inflammation, antioxidant properties. Calotropis procera found in subtropical Asia and tropical Africa. Traditional doctors in West Africa have successfully used it for bronchitis, pain, asthma and tumors. The plant is also known for its toxic properties that included dermatitis, iridocyclites and acts like a poison and produces lethal effects. The latex of Calotropis procera extract is easily available and is used in medicine for treatment of many diseases. It is used as wound healing agent, anti – diarrheas, anti inflammatory, and anti – rheumatism agent. It is also used against malaria and skin infection. The milk latex and flowers were considered to improve digestion, Cataract and increases appetite.

Keywords: Calotropis procera, Antimicrobial activity, Traditional medicine

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How to Cite this Article: Dr. P. Durai Rajan, Dr. G. Sumathi and Dr. Sowmya Nasimuddin. A study on invitro antimicrobial activity of Pure Milky Latex of Calotropis Procera. World J Pharm Sci 2019; 7(10): 8-13.

INTRODUCTION

The history of plants being used for medicinal purpose is probably as old as the history of mankind. Extraction and characterization of several active phytocompounds from these green factories have given birth to some high activity profile drugs. Simultaneous with population explosion virulent strains of microorganisms become more common and their increased attack accounts for increased mortality. Ethnopharmacologists, botanists, microbiologists and natural product chemists have been exploring the earth for photochemicals and "leads" which could be developed for the treatment of infectious diseases. Plants are rich in a wide variety of secondary metabolites, such as tannins, terpenoids, alkaloids and flavonoids which have been found to have in-vitro antimicrobial properties. Clinical microbiologists have two reasons to be interested in the topic of antimicrobial plant extracts. First, it is very likely that theses photochemicals will find their way into the arsenal of antimicrobial drugs prescribed by physicians, several of them are already being tested in human and scientists realize that the effective life span of any antibiotic is limited. Second, the public are becoming increasingly aware of problems with the over prescription and misuse of traditional antibiotics. The substances present in the plants serve as plant defense mechanism against predation by microorganisms, insects and herbivores. Higher plants are rich source of novel natural substances that can be used to develop environmental safe methods for insect control Tribolium castaneum (Herbst) is considered to be a major pest of stored grains. In Bangladesh Tribolium castaneum is abundantly found in stored grains of different cereals. Control of these insects relied heavily on the use of synthetic insecticides and fumigants which led to problems such as disturbances of the environment, increasing cost of application, pest resurgence, resistant to pesticides and lethal effect on non –target organism in addition to direct toxicity to users. Therefore, it is necessary to develop an alternative biopesticide from plant origin.

Aim: To evaluate the Antimicrobial Properties of Calotropis procera

METHODOLOGY

A Prospective observational study. The study was conducted in the microbiology lab at the Sri Muthukumaran Medical College from June 2018 to December 2018 (6 months). The study consists of 100 urine samples. Showing growth of gram positive and gram negative bacteria. Antimicrobial Properties of Calotropis procera were studied on following gram positive organism Staph. Aureus and gram negative bacteria - E.coli, Klebsiella and Pseudomonas. Incubation period for growth of bacteria - 24 hours. Control antibiotics for gram positive organism were Levofloxacin. Control antibiotics used for gram Negative organism - Amikacin (30mg). Culture Medium used for anti microbial testing was Mueller Hinton agar.

RESULTS

Table 1 Shows Susceptibility pattern to Milky Latex of Calotropis Procera. No Inhibition found in Staph. Aureus, E. coli, Klebsiella species, Pseudomonas species. Table 2 shows the Control for gram positive organism is Levofloxacin. Shows Inhibition present. Table 3 shows the control for gram Negative organisms to antibiotics Amikacin.

Table1. Susceptibility pattern to Milky Latex of Calotropis Procera

Susceptibility at given dilution (concentration)			
Bacteria	*Neet*	*1:2*	*1:4*
Staph. aureus	*No Inhibition*	*No Inhibition*	*No Inhibition*
E. coli	*No Inhibition*	*No Inhibition*	*No Inhibition*
Klebsiella . sp	*No Inhibition*	*No Inhibition*	*No Inhibition*
Pseudomonas. sp	*No Inhibition*	*No Inhibition*	*No Inhibition*

Table 2. Control Susceptibility pattern of gram positive organism to antibiotics (Disc concentrations)

Bacteria	Levofloxacin
Staph. aureus	*Inhibition present*

Table 3. Control Susceptibility pattern of gram Negative organisms to antibiotics

Bacteria	***Amikacin (30µg)***
E. coli	*Inhibition present*
Klebsiella . sp	*Inhibition present*
Pseudomonas. sp	*Inhibition present*

DISCUSSION

The Pure Milky Latex of Calotropis Procera was tested against the pathogenic bacteria for its antibacterial activity with Staph. Aureus, E. coli, Klebsiella species, Pseudomonas species.

Table: 1 Shows Susceptibility pattern to Pure Milky Latex of Calotropis Procera in the no Inhibition in Bacteria, Staph. Aureus, E. coli, Klebsiella species, Pseudomonas species. Table: 2 shows the Control for gram positive organism is Levofloxacin Shows inhibitory zone ,Table: 3 shows the control for gram Negative organisms to antibiotics Amikacin Shows inhibitory zone.

Fig: 1 Shows zone of inhibition with Levofloxacin in E.coli cultures in Mueller Hinton agar and no inhibition seen with Latex of Calotropis procera.**Fig:2** Shows zone of inhibition with Levofloxacin in Staph. Aureus and E. coli, Klebsiella & Pseudomonas species. **Fig:3** Shows zone of inhibition with Levofloxacin in Klebsiella species and no inhibition seen in Latex of Calotropis procera. **Fig:4** Shows zone of inhibition with Levofloxacin in Streptococcus and no inhibition seen in Latex of Calotropis procera. **Fig:5** Shows zone of inhibition with Amikacin in Pseudomonas,Streptococcus species.

Powdered plant material (Leaves and Flower) was extracted with ethanol, methanol and water, which were used in 5mg/ml, 10mg/ml and 20mg/ml respectively, high zone 29+4mm was shown by methanolic leaves extract at 20mg/ml against E. coli and while against Salmonella typhi, ethanolic leaves extracts gave 29+2mm at 20mg/ml.on the other hand ethanolic flower extract gave 34+0 mm at 2omg/ml against salmonella typhi and methanolic flower extracts shows 23+3mm against E. coli at 20mg/ml (Table 2 to 6) while antibiotic velosef shows 29+2mm at 10mg/ml against E.coli and Doxycycline show 34+3mm at 20mg/ml against salmonella typhi nearly equal to our extracts (3) In determining the minimum inhibition concentration, we examine different results. Crude latex and flower shows MIC at 25% against E.coli while leaves and fruit show on 75%, while against salmonella typhi latex show MIC on 100%.flower on 50%.leaves on 75% and fruit on 25% when diluted in water. but when we dilute crude extract in ethanol result were different, crude flower, leaves and fruit show MIC against both the pathogen at 25% dilution of crude extract white latex show variation against E.coli it show MIC at 50% and against salmonella at 100% (3). Now for powdered ethanolic .methanolic and aqueous leaves extracts, MIC value was 0.5mg/ml against E.coli and 1mg/ml against salmonella typhi.while for powdered ethanolic .methanolic and aqueous Flower extracts, MIC value was different. Against salmonella typhi, aqueous extract show MIC at 3mg/ml.methanolic at 1.5mg/ml and ethanolic extracts shows MIC at 1mg/ml.ang against E.coli MIC value of aqueous extract was 1.5mg/ml, for ethanolic MIC was 4mg/ml and for methanolic MIC was 1mg/ml (Table 7 to 11). While for antibiotics MIC value of Doxycycline against E.coli was 0.0685 and salmonella tyhpi was 0.0670 at 0.5mg/ml, MIC value of vibramycine against E.coli was 0.0866 at 6mg/ml and salmonella tyhpi was 0.0647 at 1mg/ml, similarly MIC value of velosef was 0.0782 against E.coli at 5mg/ml and salmonella tyhpi was 0.0629 at 1.5mg/ml (5).

CONCLUSION

The analysis of antimicrobial activity of Pure Milky latex of Calotropis Procera against Staphylococcus aureus, Escherichia coli Pseudomonas aeruginosa and Klebsiella species reveals that in disc method no zone of inhibition present. The results provide a support for the use of Pure Milky latex of Calotropis Procera further advance investigation to prove its antimicrobial actions in traditional medicine.

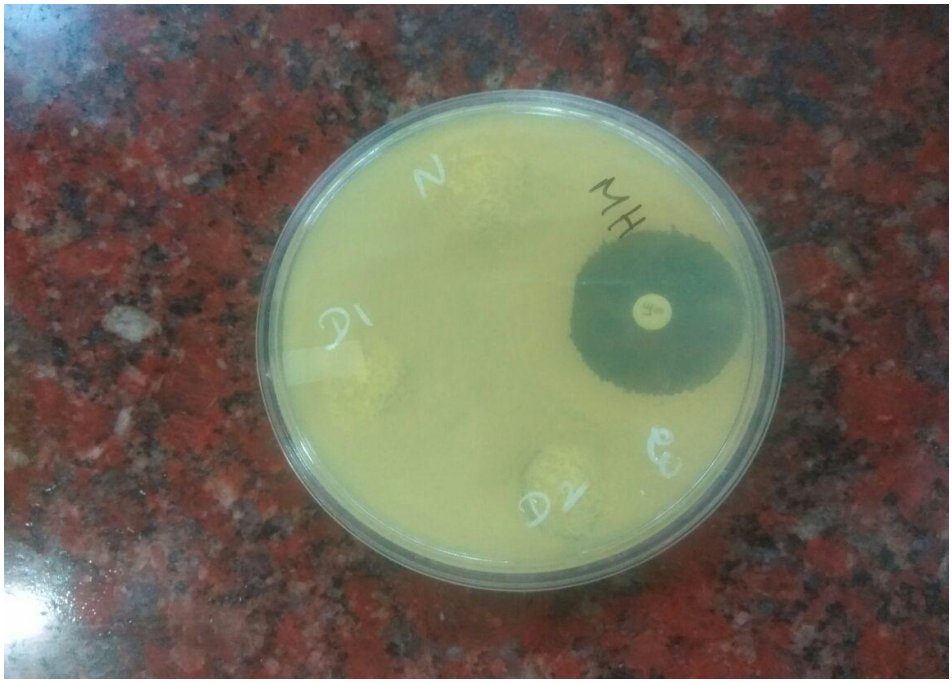

Fig: 1 Shows zone of inhibition with Levofloxacin in E.coli cultures in Mueller Hinton agar and no inhibition seen with Latex of Calotropis procera.

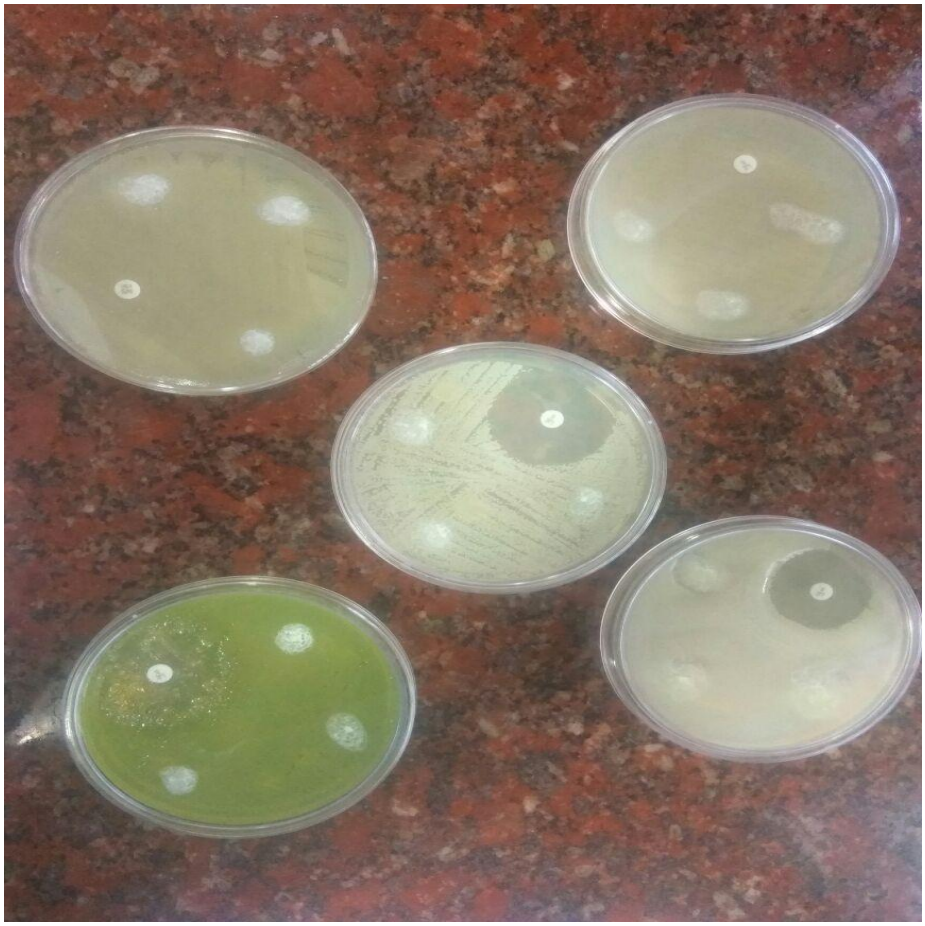

Fig:2 Shows zone of inhibition with Levofloxacin in Staph. Aureus and E. coli, Klebsiella & Pseudomonas species.

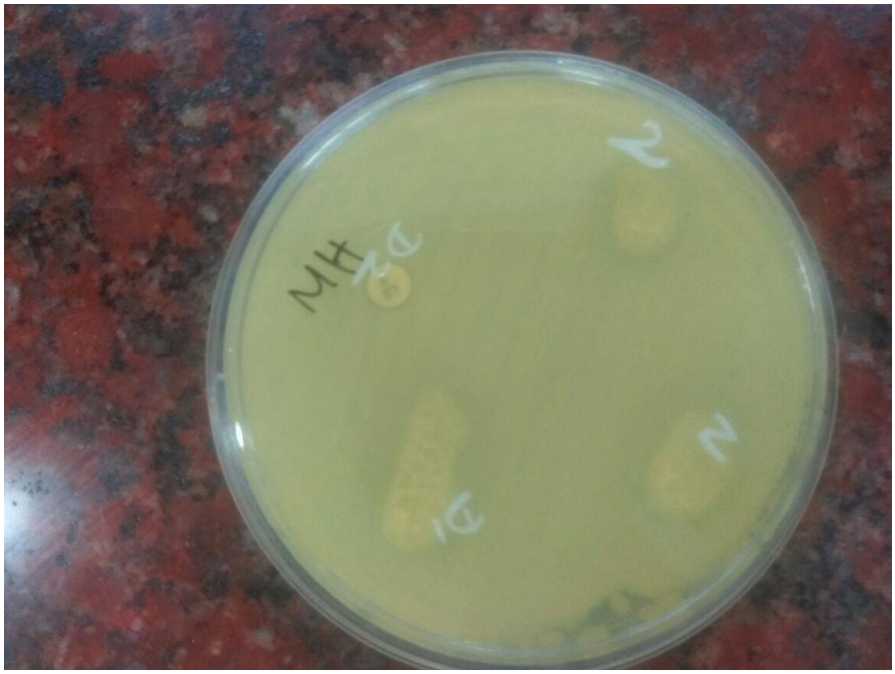

Fig:3 Shows zone of inhibition with Levofloxacin in Klebsiella species and no inhibition seen in Latex of Calotropis procera.

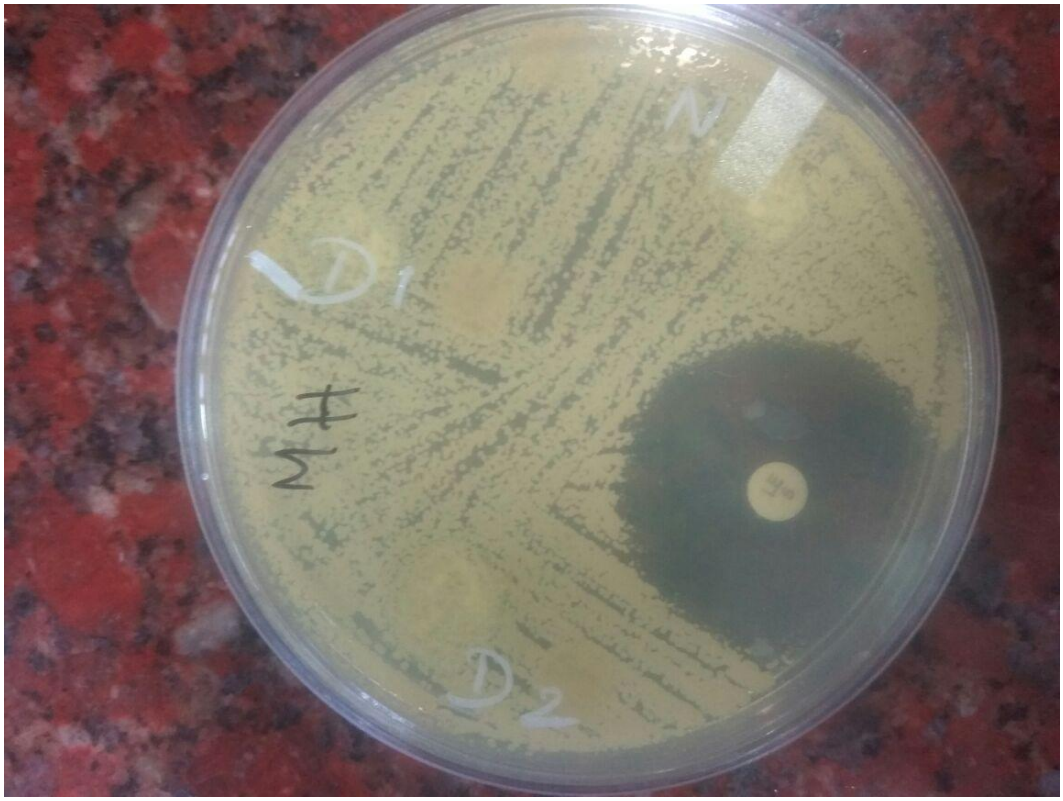

Fig:4 Shows zone of inhibition with Levofloxacin in Streptococcus and no inhibition seen in Latex of Calotropis procera.

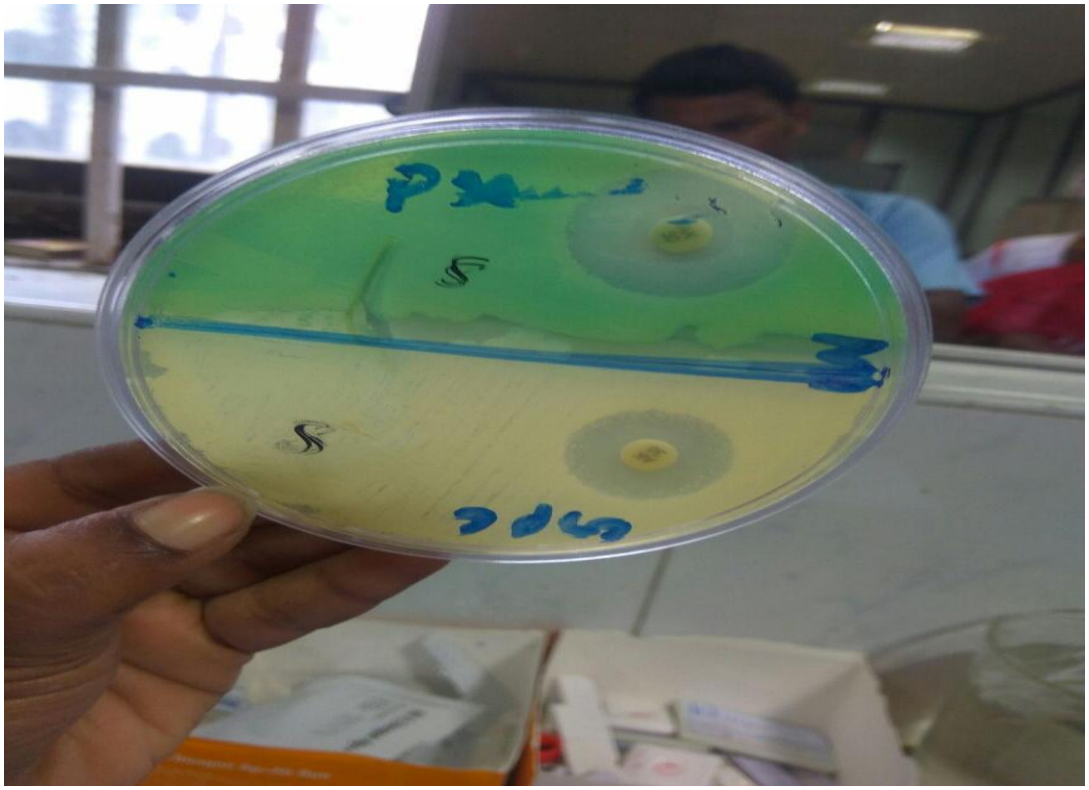

Fig:5 Shows zone of inhibition with Amikacin in Pseudomonas,Streptococcus species.

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