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ECLIPTA PROSTRATE L. A POTENT PLANT FOR ANTIBACTERIAL ACTIVITY AGAINST SOME IMPORTANT SPECIES OF SOIL BORNE BACTERIAL SPECIES

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ABSTRACT

In vitro evaluation of antibacterial activity of *Eclipta prostrate* were evaluated against four bacterial species viz., *Escherichia coli, Bacillus subtilis, Pseudomonous* Sp. and *Xanthomonas campestris.* at 10 to 100 µl concentration. Maximum activity was observed in *E.coli* followed by *X. campestris* and *B. subtilis*. Least inhibition was observed in *Pseudomonous* sp tested at different concentration. Compared to synthetic antibiotic chloramphenicol, maximum inhibition was observed in *B.subtilis* followed by *E. coli* *Pseudomonas sp* and *X. campestris.*

KEYWORDS: *E. prostrate*, antibacterial activity, bacteria, antibiotics.

INTRODUCTION

In nature, there are a huge variety of herbs, having medicinal properties and they are used to prepare the herbal medicines. Many higher plants produce economically important organic compounds[1].Plants are exploited as medicinal source since ancient age. The traditional and folk medicinal system uses the plant products for the treatment of various infectious diseases. In recent times, plants are being extensively explored for harboring medicinal properties[2].Medicinal and aromatic plants are used on a large scale in medicine against drug-resistant bacteria, which are considered one of the most important reasons for the lack of success of treatment in infectious diseases. Medicinal plants are the major sources of new medicines and may constitute an alternative to the usual drugs**.** Medicinal plants are used on a large scale in medicine against drug-resistant bacteria, which are considered one of the most important reasons for the lack of success of treatment in infectious diseases [3]. Herbal medicine has been a source of medicinal agents for thousands of years and an impressive number of modern drugs have been isolated from natural resources as a good choice, because these natural resources have ordinarily fewer side effects[4,5]. In the present study, In the present study, antibacterial activity of aqueous extract of leaf of *E. prostrate* belongs to family Asteraceae were tested against four species of bacteria *in vitro* condition.

MATERIALS AND METHODS

Test plant: Fresh healthy leaves of *E. prostrate* collected from Bangalore. The leaves were washed thoroughly two to three times with running tap water and once with sterile distilled water and air dried at room temperature on a sterile blotter, and used for the preparation of extracts.

EXTRACTION

Aqueous extract: One hundred grams of the thoroughly washed and air dried healthy leaves of *E. prostrate* were macerated with 100 ml of sterile distilled water in a waring blender (Waring International, New Hartford, CT, USA) for five minutes. The macerate was filtered through double-layered muslin cloth, and then centrifuged at 4000g for 30 minutes. The supernatant was filtered through Whatman No.1 filter paper and sterilized at 120^0 C for 10 minutes, which served as 100% aqueous mother extract. The extract was preserved aseptically in a sterile brown bottle at 5^0 C until further use[6].

Test Organism: Four bacterial species viz., *Escherichia coli, Bacillus subtilis, Pseudomonous* Sp. and *X. campestris.* were isolated from the soil by serial dilution technique. All the bacteria were maintained in nutrient agar media and maintained at 4^0C until further use.

Antibacterial Activity

Preparation of standard culture inoculums of test organism: all the four test bacterial species were inoculated in the 2 ml Nutrient broth and incubated at 37^0C for 24 hours till the growth in the broth was equivalent with Mac-Farland standard (0.5%) as recommended by WHO.

Agar cup diffusion method

An overnight culture of all the four bacteria was standardized to contain approximately 110cfu/ml and inoculated into 10 ml of nutrient broth. The culture

medium was allowed to set. After incubation, all the inoculum was swabbed over the surface of the nutrient agar medium using spreader. Sterile cork borer of 5 mm diameter were taken and five wells were made in solidified sterile nutrient agar medium (one in the centre and four wells at the corner). The agar plugs were removed with a flamed and cooled wire loop. Then 10,20,30,40 and 50, 60, 70, 80, 90 and 100% concentration aqueous extract of leaf of *E. prostrate* (50µl) were poured in the wells made in inoculated plates. 50 µl of distilled water served as control. All the plates were incubated for 24hours at 37^0C and zone of inhibition if any around the well were measured in millimeter (mm). For each treatment, ten replicates were maintained. The same procedure was followed for standard antibiotic chloramphenicol (25mg) to compare the efficacy of plant extract against all the test organisms[7].

RESULT

Four bacterial species viz., *B.subtilis*, *E. coli*, *Pseudomonas sp. and X. campestris* tested at 10 to 100 µl concentration of aqueous extract of leaf of *E. prostrate* , maximum inhibition was observed in *E. coli*, and recorded 5.0, 9.0, 15.0, 20.0, 24.0, 29.0, 32.0, 35.0. and recorded 5.0, 9.0, 15.0, 20.0, 24.0, 29.0, 32.0, 35.0.5.0 amd 36.0mm inhibition from 10 to 100 µl concentration. *E.coli* was followed by *X. campestris* and *B. subtilis* and recorded a maximum inhibition of 32.0mm inhibition at 100 µl concentration. significant activity was also observed in 10 to 90 µl concentration and recorded the inhibition percentage from 3.0 to 30.0mm . Least inhibition was observed in *Pseudomonas sp.* and recorded a inhibition of 24.0mm at 100 µl concentration and at 10 µl concentration, it was recorded 2.0mm inhibition. Compared to standard antibiotic chloramphenicol at 25mg recommended concentration, *B.subtilis* recorded 32.0mm inhibition, *E. coli* recorded 36.0mm inhibition, *Pseudomonas sp* recorded 35.0mm inhibition and . *X. campestris* recorded 32.0mm inhibition (Table 1).

Table 1: Antibacterial activity of aqueous extract of *E. prostrate* against four soil borne bacterial species.

Bacteria	Zone of inhibition(mm)										
	Concentration										
	Plant extract										Synthetic antibiotics
	10 µl	20 µl	30 µl	40 µl	50 µl	60 µl	70 µl	80 µl	90 µl	100 µl	Chloramphenicol (25mg)
B.subtilis	3.0^{a} ±0.1	6.0^{b} ±0.1	7.0^{c} ±0.0	10.0^{d} ±0.1	15.0^{e} ±0.0	21.0^{f} ±0.0	25.0^{g} ±0.0	30.0^{h} ±0.1	32.0^{i} ±0.0	32.0^{j} ±0.0	32.0^{j} ±0.1
E. coli	5.0^{a} ±0.0	9.0^{b} ±0.0	15.0^{c} ±0.1	20.0^{d} ±0.1	24.0^{e} ±0.0	29.0^{f} ±0.1	32.0^{g} ±0.1	35.0^{h} ±0.0	35.0^{i} ±0.0	36.0^{j}±0.0	36.0^{j}±0.2
Pseudomonas sp.	2.0^{a} ±0.1	4.0^{b} ±0.0	7.0^{c} ±0.0	10.0^{d} ±0.0	13.0^{e} ±0.0	16.0^{f} ±0.1	20.0^{g} ±0.0	23.0^{h} ±0.1	25.0^{i} ±0.0	24.0^{j}±0.0	35.0k±0.0
X. campestris	3.0^{a} ±0.0	5.0^{b} ±0.1	8.0^{c} ±0.1	12.0^{d} ±0.0	15.0^{e} ±0.1	21.0^{f} ±0.0	25.0^{g} ±0.0	28.0^{h} ±0.1	30.0^{i} ±0.0	32.0^{j}±0.0	32.0^{j}±0.0

- Values are the mean of ten replicates, ±standard error.
- The means followed by the same letter (s) are not significantly different at P 0.05 when subjected to Tukey's HSD.

DISCUSSION

Medicinal plants represent a rich source of antimicrobial agents[8]. Many of the plant materials used in traditional medicine are readily available in rural areas at relatively cheaper than modern medicine [9]. Despite of tremendous progress in human medicines, infectious diseases caused by bacteria are still a major threat to public health. There impact is particularly large in developing countries due to relative unavailability of medicines and the emergence of widespread drug resistance [11]. Plants generally produce many secondary metabolites which constitute an important source of microbicides, pesticides and many pharmaceutical drugs. Plant products still remain the principal source of pharmaceutical agents used in traditional medicine [12]. In the present study, the aqueous leaf extract of *E. prostrate* when tested against four bacteria showed a promising result and indicates its potency for antimicrobial activity.

CONCLUSION

From the above result it can be concluded that, the aqueous leaf extract of *E. prostrate* showed a highly significant activity against all the test bacterial species compared to synthetic antibiotic chloramphenicol. Hence a further investigation is necessary to isolate a bioactive compound which is easily biodegradable and ecofriendly.

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REFERENCE

1. Tirupatirao S, Gouri Sankar K, Kannan S, Narasimha Naik R. *(Comparative Analysis of Anti-Bacterial activity of Medicinal Plants)*. International Journal of PharmTech Research, 2014; 6(1): 262-265.
2. Gaurav K, Loganathan K, Kokati VB. *(Antibacterial Activity Of Aqueous Extract Of Calotropis Gigantea Leaves – An In Vitro Study)*, International Journal of Pharmaceutical Sciences Review and Research, 2010; 4(2): 141-144.
3. Ayman AM, Mazen Safi. *(In Vitro Antibacterial Activity of Several Plant Extracts and Oils against Some Gram-Negative Bacteria).* IJMS, 2014; 39(1): 36-43.
4. Zargari A. *(Medicinal plants).* Tehran: Tehran University Publications 1996; 3: 513- 538.
5. Kiran B. Lalitha V, Raveesha KA. (*Investigation Of The Effect Of Bioactive Compound Isolated From Seeds of Psoralea Corylifolia L. On DNA Of Pathogenic Bacteria,)* European Journal of Pharmaceutical and Medical Research, 2016; 3(5): 310-312.
6. Lalitha V, Kiran B, Raveesha KA. (*In Vitro Evaluation of Mimusops Elengi L. Plant Extract For Antibacterial Activity And Phytochemical Analysis*). Pharmacophore, 2011; 2(1): 78-85.
7. Nascimento, GGF, Locatelli J, Fereitas, PC , Silva GL. Antibacterial activity of plant extracts and hytochemicals on antibiotic resistant bacteria. Braz. journal of Microbiology, 2000; 31: 247-256.
8. Mahesh B, Satish S .(*Antimicrobial activity of some important medicinal plant against plant and human pathogens*). World J. Agri. Sci.2008; 4: 839-843.
9. Mann A, Banso A , Clifford LC. (*An antifungal property of crude plant extracts from Anogeissus leiocarpus and Terminalia avicennioides.*)Tanzania J. Health Res. 2008; 10(1): 34-38.
10. Zampini IC, Cuello S, Alberto MR, Ordonez RM, Almeida RD, Solorzano E, Isla MI. (*Antimicrobial activity of selected plant species from the Argentine puna against sensitive and multiresistant bacteria*). Journal of Ethnopharmacology, 2009; 124: 499-505.
11. Ibrahim MB. (Anti-microbial effects of extract leaf, stem and root bark of *Anogeissus leiocarpus* on *Staphylococcus aureaus, Streptococcus pyogenes, Escherichia coli and Proteus vulgaris*.) J. Pharma. Devpt.1997; 2: 20-30.