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RESEARCH ARTICLE

SCREENING OF ANTIBACTERIAL ACTIVITY IN MEDICINAL GRASS (*DACTYLOCTENIUM AEGYPTIUM*) USING TWO EXTRACT

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ABSTRACT

The present study was to investigate the antibacterial activity obtained from *dactyloctenium aegyptium* against *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *E.coli*, *Klebsiella pneumoniae*, *Proteus vulgaris* by disc diffusion method. The results showed the maximum zone of inhibition was observed in *pseudomonas aeruginosa* in ethanol extract and the minimum zone of inhibition was observed in *Proteus vulgaris*, *E.coli*, *Klebsiella pneumoniae* in ethanol extract.

INTRODUCTION

Medicinal plants are the great and their source economic value. Plant herbs are naturally gifted at the synthesis of medicinal compounds. The extraction and characterization of bioactive compounds from medicinal plants have resulted in the discovery of new drugs with high therapeutic value. Treatment using medicines of natural origin is gaining momentum nowadays on account of increasing concern about potentially harmful synthetic additives (Reische, 1998).

Medicinal plants are important part of human beings and their civilization. In India they form the back bone of several indigenous traditional systems of medicine.

Today, pharmacological studies have acknowledged the value of medicinal plants as potential source of bioactive compounds. It has been estimated that between 60-90% of the populations of developing countries use traditional and botanical medicines.. Several antibiotics were used to treat various diseases. Most of the pathogens developed drug resistance because of their limited narrow antimicrobial spectrum that leads to serious ill effect. Efforts are thus directed to identify plant product, which have broad– Spectrum antimicrobial property and no ill effect (Banginwar *et al* 2003, Farnsworth 1998, Thambekar *et al* 2006). Many drug resistant bacterial strains were developed due to the increased use of a number of antibacterial drugs. It also created the problem in controlling the growth of infectious disease causing pathogenic bacteria

In herbal medicine, crude plant extracts in the form of infusion, decoction, tincture or herbal extract are traditionally used by the population for the treatment of diseases, including infectious diseases. Although their efficacy and mechanisms of action have not been tested scientifically in most cases, these simple medicinal preparations often mediate beneficial responses due to their active chemical constituents .Plants have been used to cure different diseases from ancient times. India is known for its traditional uses of plants; in order to promote the proper uses of herbal medicine and to determine their potential as a source of new drug, it is essential to study them in a more systematic and scientific manner Asolkar *et al* (1992).Though they have medicinal and nutrients and are considered good for human consumption (Shinwari and Gilani, 2003) but there is no fact that they also cause toxicity (Gilani *et al*. 2007, 2010).

Dactyloctenium aegyptium, pan- tropical in distribution, is also a destructive weed in crop fields; it has anti-oxidant, anti-inflamatory, anticancer and antipyretic properties (Khumbongmayum *et al*., 2005; Hansakul *et al*., 2009; Jananie

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et al., 2011) and is used for treating small pox, wounds and ulcers (Heuze *et al*., 2013). The present study was undertaken to further analyze the antibacterial activity of *Dactyloctenium aegyptium*.

MATERIALS AND METHODS

Sample collection and solvent extraction

The materials selected for the present study were *Dactyloctenium aegyptium*. The plants were collected from Nagercoil, Kanyakumari District, Tamilnadu, India. Plants were dried under shade condition for one month and cut into small pieces, pulverized in a grinder and stored in sterile containers for further use .A Soxhlet extractor apparatus was used for extraction, with ethanol and chloroform solvents.

Bacterial Strains

In the present study five human pathogens were used, namely *E.coli, Klebsiella pneumoniae, Proteus vulgaris, Pseudomonas aeruginosa, Staphylococcus aureus* obtained from Inbiotics Institute of Biology of clinical Research, Nagercoil. Stock cultures were maintained in nutrient agar medium at 40^0C ,then subcultured in nutrient broth at 37^0C prior to each microbial test .

Disc Diffusion Method

Disc Diffusion method was used to screen the antibacterial activity (Bauer *et al*.,1966).The sensitivity test of the chloroform and ethanol extracts were determined using agar–disc diffusion method. Media were prepared using Muller-Hinton Agar poured in petridishes and inoculated with test organisms from the broth using cotton swabs. Disc impregnated with the plant extract were placed on the swabbed plate. The plates were incubated overnight at 37^0C for 24 hours. Amikacin was used as positive reference standard. After incubation, the clear zone around the discs were measured and expressed in mm as a measure of their antibacterial activity.

RESULTS AND DISCUSSION

The results of antibacterial activity in two extract of medicinal grass against human pathogens were shown in Table 1.The present investigation showed that the tested plant extract possess potential antibacterial activity against *E.coli, Klebsiella pneumoniae, Proteus vulgaris, Pseudomonas aeruginosa, Staphylococcus aureus*.

The chloroform extract of *Dactyloctenium aegyptium* showed the antibacterial activity against five pathogens with the inhibition zones of 9.66,9,8.33,9 and 8mm, respectively.

The ethanol extract of *Dactyloctenium aegyptium* showed the inhibition zone of 12,7.66,7.66,10.33 and 7.66mm, respectively. The maximum zone of inhibition was observed in *Dactyloctenium aegyptium* against *Pseudomonas aeruginosa* in ethanol extract and the minimum zone of inhibition was observed in *Proteus vulgaris ,E.coli ,Klebsiella pneumoniae* in ethanol extract. In the present study, it was also observed that gram negative bacteria were more sensitive than gram positive bacteria in the selected plant extract.

Table1 Inhibition Zone In *Dactyloctenium Aegyptium* Using Disc Diffusion Method.

S.no	Name of the bacteria	solvent	*Dactyloctenium aegyptium*
1	*P.aeruginosa*	Chloroform	9.66±0.57
		Ethanol	12 ±2.64
2	*E.coli*	Chloroform	9±1
		Ethanol	7.66±1.15
3	*K.pneumoniae*	Chloroform	8.33±0.57
		Ethanol	7.66±0.57
4	*S.aureus*	Chloroform	9±1.73
		Ethanol	10.33±4.04
5	*P.vulgaris*	Chloroform	8±1.73
		Ethanol	7.66±1.15

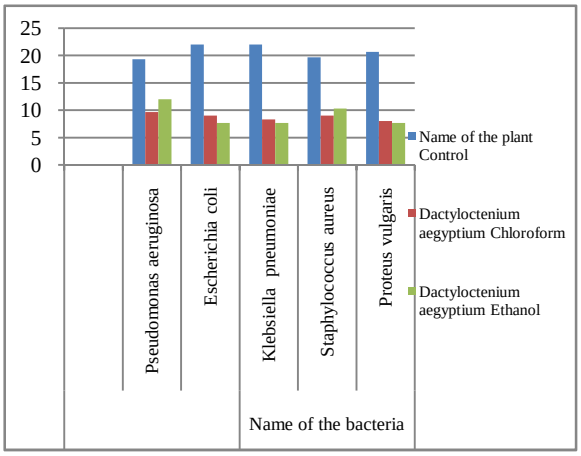
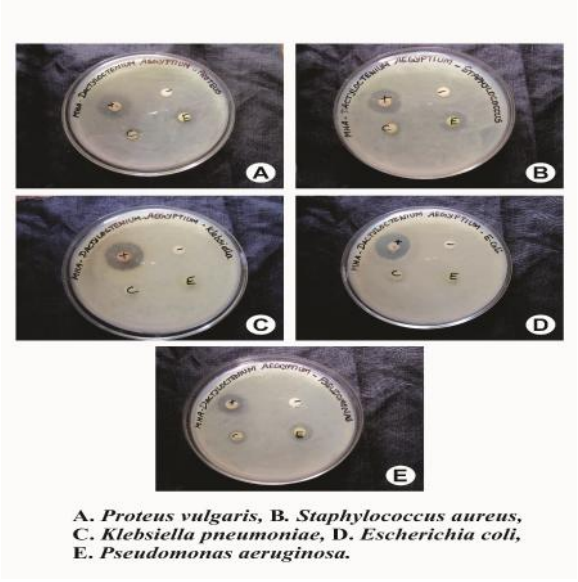


Figure1 Antibacterial Activity Of *Dactyloctenium Aegyptium* In Two Extracts



A. *Proteus vulgaris*, B. *Staphylococcus aureus*, C. *Klebsiella pneumoniae*, D. *Escherichia coli*, E. *Pseudomonas aeruginosa*.

Plate.1 antibacterial Activity In *Dactyloctenium Aegyptium*

Muhamed *et al*(2011) reported that methanol extract of *D. indicum* also showed significant antimicrobial activity against *Staphylococcus aureus* and *E.coli* with inhibition zones 22 and 20mm respectively at concentration 200mg/ml while the aqueous extract showed inhibition against *E.coli* with 18mm inhibition zones at concentration 200mg/ml were observed.

The methanol extracts of *C. dactylon* and *D. aegyptium*, that contain phenolic and flavonoid compounds, did not exhibit either antibacterial or antifungal activity even at 20 µg ml-1 of crude extract suggesting that antimicrobial compounds could be produced by certain endophytic fungal species in association and not by grass species alone. However, the reported antimicrobial activities of the above grasses Asthana *et al* (2012) might also depend on the chemical constituents following specific endophytic association.

CONCLUSION

From the above results, it is concluded that grass *Dactyloctenium aegyptium* showed antibacterial activity. Medicinal grasses are important to human beings in preservating our health. There is a growing interest in the pharmacological evaluation of *Dactyloctenium aegyptium* used in Indian traditional system of medicine.

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