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ANTI-MICROBIAL ACTIVITY OF *ECLIPTA PROSTRATA* (L.) L.

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ABSTRACT

Medicinal plants are gaining importance in the perspective of modern medicine. Individual parts of the medicinal plant have distinct characteristics. Medicinal plants have no side effects when used for the treatment of specific disorders. *Eclipta prostrata* Linn is an annual, erect, branched often rooting at the nodes; stem and branches stirgose with appressed white hairs. It is commonly called Bhringaraja and it is acrid, bitter, hot and dry reduces kapha and vaata and is a good rejuvenator. It is good for the hair and skin, expels intestinal worms, cures cough and asthma and strengthens body. It is a specific in night blindness, eye diseases, headache and diseases pertaining to hair and its growth. For the present study of antimicrobial activity the plant *Eclipta prostrata* Linn. was selected & studied. *Escherichia coli*, *Staphylococcus aureus*, *Bacillus subtilis*, *Pseudomonas aeruginosa* & *Candida albicans* were used as test organisms. The extracts of the above plant parts were studied using Agar well diffusion assay. Zones of inhibition of different treatment groups were measured and compared.

KEYWORDS: *Eclipta prostrata, Escherichia coli*, *Staphylococcus aureus, Bacillus subtilis* , *Pseudomonas aeruginosa* ,*Candida albicans,* anti-microbial.

INTRODUCTION

Eclipta prostrate belongs to family Asteraceae (Hooker, 1883). It has sessile leaves, 2.5-8cm long, variable in breadth, usually oblong-lanceolate, subentire, appressed hairs on both sides, base tapering. The inflorescence is head 6-8mm diameter, solitary on unequal axillary peduncles. Involucre of bracts is present, about 8, ovate, herbaceous, strigose with appressed white hairs. Ray flowers ligulate, the ligule small, spreading, scarcely as long as the bracts, not toothed, white disk-flowers tubular, the corollas often 4-toothed. (Almeida, 2001) The plant has been found to posses myocardial depressant and hypotensive effect. It is found to be

effective in the treatment of infective hepatitis and against injury and inflammation. Leaves contain stigmasterol and a- terthienymethanol, alkoidsecliptine & nicotine. Sixteen new biogenetically closely related polyacetyenicthiophenes have been isolated. (Kapoor, 1990).

USES

Herb is tonic and de-obstruent in hepatic and spleen enlargements, emetic, used in skin diseases. Juice of plant in combination with aromatics administered for catarrhal jaundice. Leaves are used in scorpion sting. Juice of leaves along with honey used as remedy for catarrh in infants (Bhattacharjee, 2004). Decoction of leaf and root is liver tonic. Root is emetic and purgative; applied externally as antiseptic to ulcers and wounds in cattle. A preparation obtained from the juice of leaves boiled with sesamum or coconut oil is used for anointing the head to render the hair black and luxuriant. Fresh plant is considered anodyne and absorbent. It is rubbed on the gums in toothache and applied with a little oil for relieving headache. It is also applied with sesamum oil in elephantiasis. Drug is extensively used against jaundice (Kirtikar & Basu, 2006).

Antimicrobial studies have been done for plant extracts like *Calotropis gigantea* (Vaidya & Thakur, 2015), *Psidium guajava* (Vaidya, 2013), *Holarrhena antidysenterica* (Vaidya, 2015).

MATERIAL AND METHODS

Agar cup method

The agar cup method was used to study the antibacterial activity of the extracts. Briefly, bacterial culture from culture plates was scooped using a wire loop and separately mixed with normal saline. A loopful was withdrawn and was mixed with the agar broth and then was poured in petriplate. The plate was kept standstill until the agar solidify. Wells of approximately 6mm in diameter and 2.5mm deep were made on the surface of the solid medium using a sterile borer. The extracts were inoculated in the well having the concentration 100, 200, 300, 400, 500µg/mL. Solvent blank was also inoculated. The plates were incubated at 37°C for 24 hours. After 24 hours, the plates were removed and zones of inhibition measured and the results were tabulated. Extracts with zone of inhibition greater or equal to 7mm diameter were regarded as positive.

The cultures used were

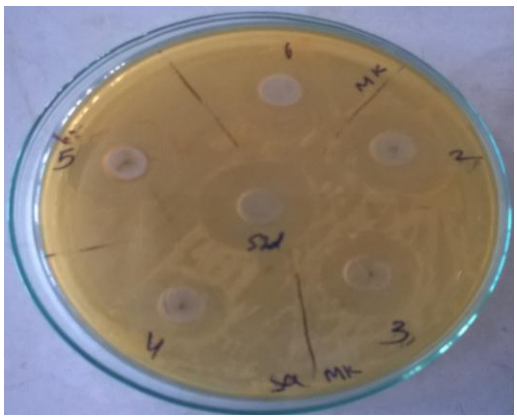
Escherichia coli (NCIM-2066), *Staphylococcus aureus* (NCIM - 5021), *Pseudomonas aeruginosa* (NCIM-2036), *Bacillus subtilis* (NCIM 2195) & *Candida albicans* (NCIM 3471) were used as test organisms. All these bacterial cultures were grown at 37°C and maintained at 4°C on nutrient agar slants. Were used to check for antimicrobial activity. The test organisms were sourced from NCIM, Pune.

OSERVATIONS

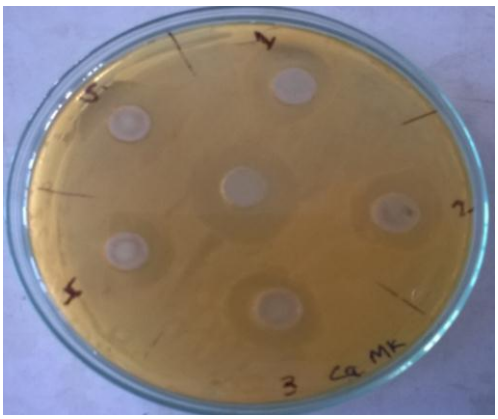
The organisms tested showed the following results

Organism	500 ug/ml	400 ug/ml	300 ug/ml	200 ug/ml	100 ug/ml	Std (Streptomycin) 100 ug/ml
S. aureus	18	17	16	16	15	22
B. subtilis	17	16	16	15	14	28
E. coli	19	18	18	17	17	15
P. aeruginosa	19	18	17	16	16	16
C. albicans	16	13	11	10	10	Not tested

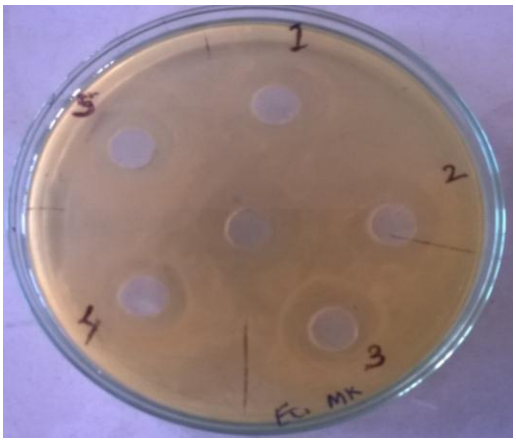
Zone of inhibition diameter measured in mm, Bore size 8mm



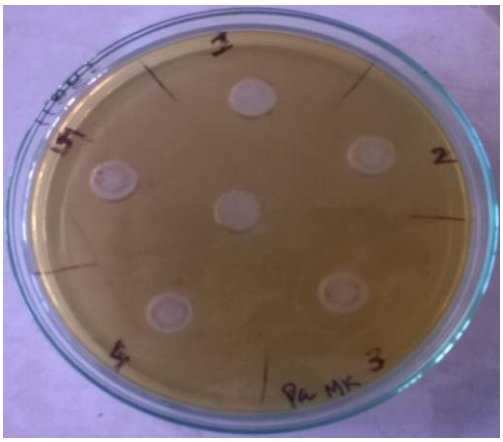
Staphylococcus aureus



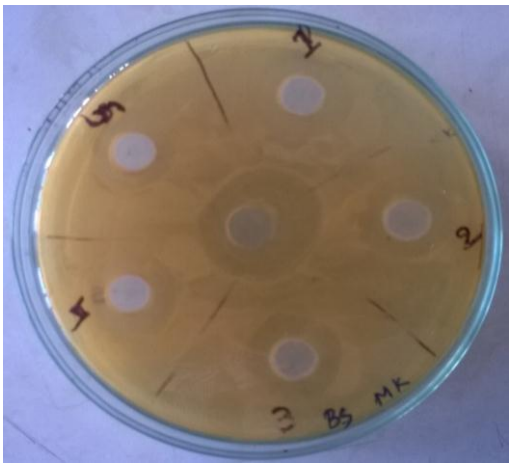
Candida albicans



Escherichia coli



Pseudomonas aeruginosa



Bacillus subtilis

RESULTS

Escherichia coli, Staphylococcus aureus, Pseudomonas aeruginosa, Bacillus subtilis & Candida albicans were tested for the antimicrobial properties of *Eclipta prostrata.* All these cultures showed a zone of inhibition in the increasing order in all the concentrations of 100ug/ml, 200ug/ml, 300ug/ml, 400ug/ml. Maximum zone of inhibition was seen in 500ug/ml in all the organisms proving that the plant has anti-microbial properties & could possibly be used as medicine.

CONCLUSION

Over the last few years, researchers have aimed at identifying and validating plant-derived substances for the treatment of various diseases. Interestingly, it is estimated that more than 25% of modern medicines are directly or indirectly derived from plants. This revival of interest in plant-derived drugs is mainly due to the current widespread belief that "green medicine" is safe and more dependable than the costly synthetic drugs, many of which have adverse side effects. In many of the developing countries the use of plant drugs is increasing because modern life saving drugs are beyond the reach of three quarters of the third world's population although many such countries spend 40-50% of their total wealth on drugs and health care. As a part of the strategy to reduce the financial burden on developing countries, it is obvious that an increased use of plant drugs will be followed in the future.

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