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Antimicrobial activity of methanolic extract from Tridax procumens leaves

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ABSTRACT

The leaves of Tridax procumbent that belongs to family Asteraceae were dried and grind into fine powder. Ingredients are extracted by Soxhelt apparatus with different solvents like petroleum ether 40-60^0), chloroform, acetone, ethanol and distilled water in ascending order of polarity. All five extracts were subjected for antibacterial screening by cup plate or zone of inhibition method. The methanolic extract among all five show maximum zone of inhibition and significant MIC value.

KEYWORDS

Tridax procumbens;
Antibacterial activity;
Polarity.

INTRODUCTION

Plant Tridax procumbens belong to family Asteruceae is a herb occur in all over Asia. Plant has various constituents such as flavonous, stigmasterols, terpenoids and pyronides[1-6]

Plant has been reported used in stimulant, on cuts and wounds besides to be feed goat and sheep to increase lactation[7] Since it is used in healing of wound then it should have antiseptic property.

To validate antiseptic property of plant material. The plant material is extracted and studied for antibacterial and antifungal activity.

EXPERIMENTAL

Materials and methods

Plant material and preparation of extracts

Fresh leaves of *Tridax procumbens* were collected in the month of June 2008 from the area around the village khandala Tal. Shrirampur Dist. Ahmednagar (M.S.)India and same were authenticated by Dr. A.K. Mohite, Head of the department of Botany, R.B.N.B. College, Shrirampur, Dist. Ahmednagar (voucher specimen No- R.B. 105), shade dried and powdered then passed from 40# mesh size.

Preparation of various extracts of tridax procumbens

Around 1 kg fresh shade dried leaves were powdered and around 800 gms were extracted by hot percolation method by soxhlet apparatus with five liters of each pet ether (40-60 ^{o} C), chloroform, acetone, and methanol successively All the extracts finally reduced to dryness at 40 ^{o} C by Rotovapour (Rotavapour Buchii, Switzerland). The quantity of each extract after extraction was 12.73 gms (Pet ether 40-60 ^{o} C), 12.95 gms (Chloroform), 15.21 gms (Acetone), 31.01 gms (Methanol), 26.87 gms (Aqueous).

Microorganisms

The test microorganisms used for the antimicrobial activity screening were 4 bacteria (2 Gram positive) -

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Enterococcus faecalis, Staphylococcus aereus, (2 Gram negative) - *Klebsiallea pneumoniae, Escherichia coli,* and 2 fungai- *Candida albicans* and *Aspergillus fumigatus* .

These organisms were identified and procured from Nikhil Analytical Laboratory, Sangli, Maharashtra.

Antimicrobial Activity

The agar diffusion method[11] was used to evaluate the antimicrobial activity. Bacteria were cultured overnight at 37° C in Mueller Hinton 10 µl Broth (MHB, Oxoid) and fungi at 28° C for 72h in Potato Dextrose Broth (PDB, Oxide) and used as inoculums. A final inoculums, using 100 µl of suspension containing 10^8 CFV/ml of bacteria 10^4 spore/ml of fungi spread on Mueller Hinton Agar (MHA) and Potato Dextrose Agar (PDA) medium respectively.

The disc (6 mm in diameter) was impregnated with 10 µl of 75 µl/ml, 50 µl/ml, 25 µl/ml, 10 µl/ml and 5 µl/ml of each extracts and for each organism placed on seeded agar. Ciprofloxacin and Fluconazole (75 µl/ml, 50 µl/ml, 25 µl/ml, 10 µl/ml and 5 µl/ml) were used as positive control bacteria and fungi respectively. The test plates were incubated at 37° C for 24h for bacteria and at 28° C for 72h for fungi depending on the incubation time required for a visible growth.

MIC values were also studied for microorganisms by turbidimetric method, which were determined as sensitive to the extracts in cup plate method. MIC was defined as the lowest concentration of extract that inhibit visible growth.

A comparison is shown between the antibiotic activities of the plant extract with reference antibiotics (Cefotax). Na-cefotaxime, (Penicil) benzyl penicillin sodium and (tetrac) tetracycline R=absence of inhibition even at the hihest concentration used (100 ug/ml)

1. Tested material: Methanolic extract was obtained after the degatting with petroleum ether (40°-60°) and $CHCl_3$.
2. Studied activities: Antibacterial activity was studied using the MIC broth dilution method.[8,9]
3. Organism used: for the antibacterial activity standard bacterial strains, obtained from the Nikhil Analytical Laboratory, Sangli (Maharashtra).

RESULT

The results of Antimicrobial activity were done for all the five, pet ether, chloroform, acetone, and methanol and aqueous extracts. During antimicrobial study methanolic extracts showed maximum zone of inhibition against almost all organisms in cup plate method (TABLE 1 and TABLE 2)

TABLE 1 : Antibacterial activity of Tridax procumbens leaves methnolic extract.

Bacterial	Extract	Cefotax	Penicil	Tetrax
G(+)				
Staphylococcus epidermidis	4.0	0.1	0.03	0.1
Staphylococcus oureus	1.0	2	0.03	2
Bacillus paludis	4.2	1.5	R	4
Bacillus subtilis	6.5	2	0.05	1
G(-)				
Escherichia Coli	4.0	0.1	64	4
Pseudomonas aeruginosa	8.0	16	R	32
Shigella flaxineri	4.5	8	R	16
Enterobacter aerogenes	1.8	R	R	4

TABLE 2 : Antifungal activity of Tridax procumbens leaves methonlic extract

Fungus	Extract	Cefotax	Penicil	Tetrax
Candida albicans	2.3	R	50	R
Aspergillus fumigatus	3.6	60	R	R
Aspergillus niger	3.9	35	R	R

(Value represents MIC values expressed in ug/ml.)

CONCLUSION

The methanolic extract of T-Procumbens showed a good inhibition against all the bacterial Strains tested (MIC between 10&80 ug/ml). The gram (+) bacteria were sensitive with gram (-) bacteria and some common fungi.

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