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EVALUATION OF ANTIMICROBIAL POTENTIAL OF *VETIVERIA LAWSONII*

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ABSTRACT

India is considered to be the home of many medicinally important plant species. The present study was aimed to evaluate the antimicrobial activity of *Vetiveria lawsonii* (Family-Poaceae). The ethanol extract was prepared by Soxhlet extraction. The qualitative screening of the plant revealed that the presence of Alkaloids, Flavonoids, Terpenoids, Steroids, Carbohydrates, Glycosides, Saponins, Phytosterols and Proteins. The ethanol extract of *Vetiveria lawsonii* showing high antimicrobial activity against the microbes revealed by Agar well diffusion method. Hence, we can conclude that the ethanol extracts of *Vetiveria lawsonii* was possess antimicrobial activity.

KEYWORDS

Vetiveria lawsonii, ethanol extract, antimicrobial activity, Agar well diffusion method and Soxhlet extraction.

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INTRODUCTION

Medicinal plants are of great importance to the human health. The medicinal value of these plants is due to the phytochemicals that produce a definite physiological action on the human body. The plants kingdom is classified into four major groups those are further divided into various families. The Poaceae is one of the family which having medicinal value. *Vetiveria lawsonii* is an Indian plant belongs to the family Poaceae. The literature review revealed no documentation of scientific work on *Vetiveria lawsonii*. In the present study, an attempt has been made to evaluate the antimicrobial activity¹⁻³.

MATERIAL AND METHODS

Collection of identified Plant material

The powdered plant material of *Vetiveria lawsonii* were collected from Sri Venkateswara Agencies, Siddha & Ayurvedic Medical in Tiruchirappalli District, Tamilnadu State, India and authenticated by Dr. K. G. Sathishbabu, M.D. (Siddha), Tiruchirappalli District, Tamilnadu State, India. The plant material was used for the study.

Preparation of Flower Extracts

The Ethanol extract was successively prepared by hot continuous percolation method in 1:10 (w/v) ratio by Soxhlet extraction and concentrated. Then it was subjected to dryness to yield crude residue. This residue was employed for Antimicrobial evaluation.

Phytochemical Screening

The Ethanol extracts were analyzed for the presence of phytochemicals according to standard methods given by J.B. Harborne.

Microbial strain

For the evaluation, the pure microbial strain cultures were collected from the Biotechnology Laboratory of Bishop Heber College, Tiruchirappalli (Ref. No.:BHC-BT-CTS03/2014/NMC) and used. The gram-positive and gram-negative bacterias namely *E.coli*, *Proteus sp.*, *Streptococcus sp.* and *Klebsiella sp.* were taken for this investigation and they were cultured on Nutrient Agar (Hi Media) Slants at 4°C. In this evaluation, Streptomycin (100µg/mL) was used as a reference standard⁴.

Antibacterial assay

The antibacterial activity assay of plant extract was performed by Agar well diffusion method. 20mL of sterile muller Hinton agar (Hi Media) was poured in

sterile petri dishes. The plates were allowed to solidify and used. 10mL of sterilized Muller Hinton agar medium (Seed Agar) was seeded with organisms (about 0.2mL according to 0.5 McFarland's standard), in semi hot conditions and was poured uniformly on the base agar. 8mm bores were made each equal distance from one another on the medium using sterile borer and 100µL of different urine preparation were added to respective bore. The plates were incubated at 37°C for 24 hrs and zone of inhibition were measured. For each test, three replicates were performed. Here an attempt was made to compare the antibacterial efficiency of flower extract along with activity of standard antibiotic⁵⁻⁷.

RESULTS AND DISCUSSION

The results of Preliminary Phytochemical analysis were furnished in Table No.1.

The results of Antimicrobial activity of Ethanol extracts of *Vetiveria lawsonii* are furnished in Table No.2. The Ethanol extract was exhibited maximum potential against *Proteus sp.* (9mm) and no potential against *Klebsiella sp.* (0mm). The photographs of the result of Antibacterial potential of Ethanol extracts are presented in Figure No.1.

The results revealed that the Ethanol extract is potent antimicrobials against the test organism. The antibacterial activity was observed from the zone of inhibition. The preliminary evaluation emphasizes further research to describe the bioactive compounds involved for their antimicrobial activity and to evaluate their other pharmacological activities of the plant.

Table No.1: Results of Preliminary Phytochemical analysis of *Vetiveria lawsonii*

S. No	Compounds	Ethanol Extracts
1	Alkaloids	+
2	Flavonoids	+
3	Carbohydrates	+

4	Saponins	+
5	Phenols	-
6	Tannins	-
7	Terpenoids	+
8	Proteins	+
9	Cardiac Glycosides	+
10	Steroids	+
11	Anthocyanins	-
12	Aminoacids	-
13	Phytosterols	+

+: Indicates the presence of phytoconstituents, -: Indicates the absence of phytoconstituents

Table No.2: Result of Zone of inhibition of Antibacterial activity of Ethanol extracts of *Vetiveria lawsonii*

S. No	Name of the bacteria	Mean Zone of Inhibition of Ethanol Extract
		(mm)
1	<i>E.coli</i>	5
2	<i>Proteus sp.</i>	9
3	<i>Streptococcus sp.</i>	1
4	<i>Klebsiella sp.</i>	0



Figure No.1: Photograph of a dish showing zone of inhibition of Ethanol extracts

CONCLUSION

It has been concluded that the Ethanol extracts of the *Vetiveria lawsonii* showed significant antimicrobial activity against selected microbes by Agar well diffusion method.

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REFERENCES

1. Gupta VH, Wankhede SS, Gunjal MA, Juvekar AR. Antidepressant like effect of couroupita guianensis aubl. Flowers in animal model of depression, *International Journal of Toxicological and Pharmacological Research*, 4 (2), 2012, 12-16.
2. Harborne JB. Phytochemical methods, Chapman and Hall Ltd, London, 1973, 49-188.
3. Kavitha R, Kamalakannan P, Deepa T, Elamathi R, Sridhar S, Suresh Kumar J. In vitro Antimicrobial Activity and Phytochemical Analysis of Indian Medicinal Plant Couroupita guianensis Aubl., *J. Chem. Pharm. Res.*, 3 (6), 2011, 115-121.
4. Muni Kumar Dokka and Siva Prasad Davuluri. Antimicrobial activity of a trypsin inhibitor from the seeds of *Abelmoschus moschatus*. L, *Int.J.Curr.Microbiol.App.Sci.*, 3 (5), (2014), 184-199.
5. Shah GN, Shete SA, Patil VS, Patil KD, Killedar SG. Standardization and Anti Bacterial Activity of Couroupita guianensis Fruit Pulp Extract, *International Journal of Pharmacognosy and Phytochemical Research*, 4 (4), 2012-13, 185-189.
6. Umamaheshwari S, Mahadeva Murthy S. Antibacterial Activity of Root of *Aristolochia Indica* on *Bacillus Subtilis*, *J Pharm Sci*, 2 (2), 2012, 82-85.
7. Vijayalakshmi Krishnamoorthy, Priya Nagappan, Khadira Sreen A and Ranjani Rajendran. Preliminary Phytochemical Screening of the fruit rind of *Garcinia cambogia* and leaves of *Bauhinia variegata* A Comparative study, *Int.J.Curr.Microbiol.App.Sci.*, 3 (5), (2014), 479-486.