



MICROBIOLOGICAL INVESTIGATION ON *VETIVERIA LAWSONII*

VIJI SARAL ELEZABETH D¹ AND RAMACHANDRAN P^{2*}

¹PG & Research Department of Chemistry, Nehru Memorial College, Puthanampatti – 621 007, Tiruchirappalli, Tamilnadu, India

²Department of Chemistry (S&H), Kongunadu College of Engineering and Technology, Thottiam – 621 215, Tiruchirappalli, Tamilnadu, India

ABSTRACT

Indian medicinal plants are playing an important role in the traditional healing system. *Vetiveria lawsonii* is the most important plant belongs to *Poaceae* family with great medicinal value. This study was aimed to investigate the microbiological activity of *Vetiveria lawsonii*. The various extracts of *Vetiveria lawsonii* were prepared by soxhlet extraction method using acetone, benzene, chloroform, ethanol, methanol and n-Hexane. The results were confirmed methanol extracts of *Vetiveria lawsonii* showing significant activity against selected microbes than other extracts. We recommend further research on this plant for possible pharmacological investigation of the various chemical active substances.

KEYWORDS: *Poaceae*, *Vetiveria lawsonii*, soxhlet extraction method, microbes, pharmacology



RAMACHANDRAN

Department of Chemistry (S&H), Kongunadu College of Engineering and Technology, Thottiam – 621 215, Tiruchirappalli, Tamilnadu, India

*Corresponding author

INTRODUCTION

Plants are playing an important role in Indian healing system from ancient time. Nearly 75% of the population uses plants as medicine for their treatment against various infectious diseases in the world. Recently, there is a vast increase of interest in using herbal treatment. This is due to the safe and availability of medicinal plants around the world. *Vetiveria lawsonii* (Family: Poaceae) is commonly found in India. This is the meaning of *Chrysopogon lawsonii* (Hook.f.) Veldkamp. There was no report about the antimicrobial activity of this plant. Hence, in the present study the various extracts of *Vetiveria lawsonii* was evaluated for their antimicrobial activity.

MATERIALS AND METHODS

(i) 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 MD (Siddha), Tiruchirappalli District, Tamilnadu State, India. The plant material was used for the study.

(ii) Preparation of Extracts

The extracts were successively prepared by hot continuous percolation method in 1:10 (w/v) ratio by Soxhlet extraction and concentrated using acetone, benzene, chloroform, ethanol, methanol and n-Hexane¹. Then these were subjected to

dryness to yield crude residue. These residues were employed for antimicrobial evaluation.

(iii) Microbial strain

For the evaluation, the pure microbial strain cultures were collected from the Biotechnology Laboratory of Bishop Heber College, Tiruchirappalli 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 standard.

(iv) Antibacterial assay

The antibacterial activity assays of extracts were 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 extracts along with activity of standard antibiotic.

RESULTS

The results of antimicrobial activity of the extracts of *Vetiveria lawsonii* are furnished in the following Table 1.

Table 1

RESULT OF ZONE OF INHIBITION OF ANTIBACTERIAL ACTIVITY OF EXTRACTS OF VETIVERIA LAWSONII

S.No.	Name of the bacteria	Mean Zone of Inhibition of Plant Extracts (mm)					
		Acetone	Benzene	Chloroform	Ethanol	Methanol	n-Hexane
1	<i>E.coli</i>	0	8	0	5	8	0
2	<i>Proteus sp.</i>	4	1	0	9	7	9
3	<i>Streptococcus sp.</i>	2	0	1	1	8	1
4	<i>Klebsiella sp.</i>	1	5	0	0	15	8

The Methanol extract was exhibited maximum potential against the selected microbes when compared with the other extracts of the plants. The graph 1 is showing the zone of inhibition of various extracts of *Vetiveria lawsonii*.

Graph 1
MEAN ZONE OF INHIBITION OF VETIVERIA LAWSONII

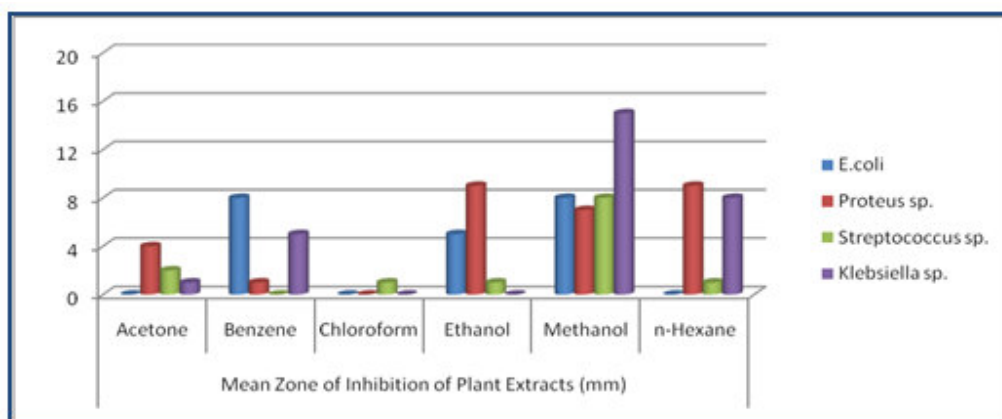


Figure 1
Mean Zone of inhibition of various extracts of *Vetiveria lawsonii*.

DISCUSSION

The results also revealed that the Methanol extract is showing the maximum potential of 15mm against *Klebsiella sp.* and minimum of 1mm against *Streptococcus sp.* 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.

REFERENCES

1. Harborne J. B. Phytochemical methods. Chapman and Hall Ltd. London. 49 – 188, (1973).
2. Alagesaboopathi C. Antimicrobial screening of selected medicinal plants in Tamilnadu, India. African Journal of Microbiology Research, 5 (6): 617 – 621, (2011).
3. Muhit Md Abdul., Apu Apurba Sarker., Islam Md Saiful., Ahmed Muniruddin. Cytotoxic and Antimicrobial activity of the crude Extract of *Abutilon Indicum*. International Journal of Pharmacognosy and Phytochemical Research, 2 (1): 1 – 4, (2010).

CONCLUSION

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

ACKNOWLEDGEMENT

The Authors would wish to acknowledge the Management and Principal of Nehru Memorial College for providing research facilities and encouragement. They would like to acknowledge Dr. K. G. Sathishbabu MD (Siddha), Tiruchirappalli District, Tamilnadu State, India.

4. Aiyelaagbe O.O., Paul M. Osamudiamen. Phytochemical screening for active compounds in *Mangifera indica* leaves from Ibadan, Oyo State. *Plant science Research*, 2 (1), 11 – 13, (2009).
5. Amarnath Reddy Ganji., Anil Chowdary Yedla P., Ravi P., Madhava Reddy P. V. Anti-bacterial Investigation on Different Root Extracts of *Mimosa rubicaulis* Lam. *International Journal of Pharmacognosy and Phytochemical Research*, 2 (4), 18 – 21, (2010).
6. Subhashini D. Antibacterial Potency of Nanosilver Synthesized from the Fruit Filtrate of *Citrus Sinensis*. *International Journal of Pharma and Bio Sciences*, 6 (2), 396 – 403, (2015).
7. Karthikeyan K*, Dhanapal C. K., and Gopalakrishnan G. Preliminary Phytochemical Investigation of Whole Plant of *Alysicarpus Monilifer* (L.) DC. *International Journal of Pharma and Bio Sciences*, 6 (2), 67 – 72, (2015).
8. Nathar Varsha N., and Yattoo Ghulam M. Investigation on Secondary Metabolites in *Cissus Quadrangularis* Linn. *International Journal of Pharma and Bio Sciences*, 6 (2), 349 – 353, (2015).
9. Patil S. M., Saini R. Antimicrobial Activity of Flower Extracts of *Calotropis Gigantea*. *Int. J. Pharm. Phytopharmacol. Res.*, 1 (4): 142 – 145, (2012).
10. Kiew R., Baas P. *Nyctanthes* is a member of Oleaceae. *Proc. Indian Acad. Sc. (Plant Sc.)*, 93 (3), 349 – 358, (1984).
11. Sujatha S. Complementary and alternative therapies in palliative care; A transition from modern medicine to traditional medicine in India. *J cancer pain symptom palliation*, 1, 25 – 9, (2005).
12. Sani Ali Audu., Ilyas Mohammed., et al. Phytochemical screening of the leaves of *Lophira lanceolata* (Ochanaceae). *Life science Journal*, 4 (4), 75 – 79, (2007).
13. Sneha Verma., Tandra Mohanta., et al. Phytochemical and Pharmacological Evaluation of selected plants. *American Journal of Biochemistry and Biotechnology*, 9 (3), 291 – 299, (2013).
14. Umar Zayyanu Usman., and Mahaneem Mohamed*. Analysis of Phytochemical Compounds in Water and Ethanol Extracts of Malaysian Propolis. *International Journal of Pharma and Bio Sciences*, 6 (2), 374 – 380, (2015).
15. Vats Manisha., Sharma Neha., Sardana Satish. Antimicrobial Activity of Stem Bark Extracts of *Nyctanthes arbortristis* linn. (Oleaceae). *International Journal of Pharmacognosy and Phytochemical Research*, 1 (1), 12 – 14, (2009).