

Qualitative and Microbiological Study on *Vetiveria Lawsonii*

Viji Saral Elezabeth D¹, Ramachandran P^{1*}

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

²Research Scholar, PG & Research Department of Chemistry, Nehru Memorial College,
Puthanampatti – 621 007, Tiruchirappalli, Tamilnadu, India

Abstract: Objectives: Qualitative and Microbiological Study was aimed to appraise the antimicrobial activity of *Vetiveria lawsonii* of Poaceae family. Methods and Materials: The standard phytochemical extraction method of soxhlet extraction was used to prepare the extract of *Vetiveria lawsonii* from fresh pulverized material. The solvents used for the extraction were n-Hexane and chloroform. The qualitative screening of the plant was made by standard phytochemical methods proposed by Horbone. For the microbiological investigation, the Agar well diffusion method was used. Results: With the help of qualitative screening we found that *Vetiveria lawsonii* contains Flavonoids, Terpenoids, Saponins, Phytosterols, Proteins, Steroids and Anthocyanins. By the view of the microbiological investigation of extracts of *Vetiveria lawsonii*, we found out that n-Hexane extracts showed significant potential against the selected microbes. Conclusion: We conclude that the n-Hexane extracts of *Vetiveria lawsonii* showed significant potential against the selected microbes than chloroform extracts.

Keywords: *Vetiveria lawsonii*, n-Hexane, microbiological, Agar well diffusion method, Soxhlet extraction

1. Introduction

Recently, the usage of primordial medicinal systems has increased tremendously due to their low cost and fewer side effects. In India, copious medicinally important plant species are used in the medicinal systems of ayurvedic, siddha and unani. The medicinal value of these plants is due to the phytochemicals that produce a definite physiological action on the human body [1].

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 activity.

2. Material and Methods

2.1 Collection of identified Plant material

Vetiveria lawsonii were collected in the form of powder 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.

2.2 Preparation of Flower Extracts

The successive preparation of n-Hexane and chloroform extracts made by hot continuous percolation method in 1:10 (w/v) ratio and concentrated. Then it was subjected to dryness to yield crude residue. This residue was employed for quantitative and antimicrobial evaluation [2].

2.3 Quantitative Screening

The n-Hexane and chloroform extracts were analyzed for the presence of phytochemicals quantitatively [3].

2.4 Microbial strain

For the microbiological investigation, 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 microbes 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.

2.5 Antimicrobial assay

The antimicrobial activity assay of plant 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 with 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 antibiotic.

3. Results and Discussion

The qualitative screening of *Vetiveria lawsonii* revealed that the presence of Flavonoids, Terpenoids, Saponins, Phytosterols, Proteins, Steroids and Anthocyanins in the extracts. The results of quantitative screening were furnished in Table I.

Table 1: Results of quantitative screening of *Vetiveria lawsonii*

S.No.	Compounds	n-Hexane Extracts	Chloroform 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

From the Agar well diffusion method, it was confirmed that the n-Hexane and chloroform extracts of *Vetiveria lawsonii* potent against the selected microbes. But n-Hexane extracts exhibited high antimicrobial potential against the selected microbes when compared with chloroform extracts of *Vetiveria lawsonii*. This potential of n-Hexane extracts might be the presence of various phytoconstituents. The results of antimicrobial activity of n-Hexane and chloroform extracts of *Vetiveria lawsonii* are furnished in Table II.

Table 2: Results of antimicrobial activity of n-Hexane and chloroform extracts of *Vetiveria lawsonii*

S.No.	Name of the bacteria	Mean Zone of Inhibition (mm)	
		n-Hexane Extract	Chloroform Extracts
1	E.coli	0	0
2	Proteus sp.	9	0
3	Streptococcus sp.	1	1
4	Klebsiella sp.	8	0

The figure – 1(a) and figure – 1(b) are showing the result of antimicrobial activity of n-Hexane and chloroform extracts of *Vetiveria lawsonii* respectively.



Figure 1(a)

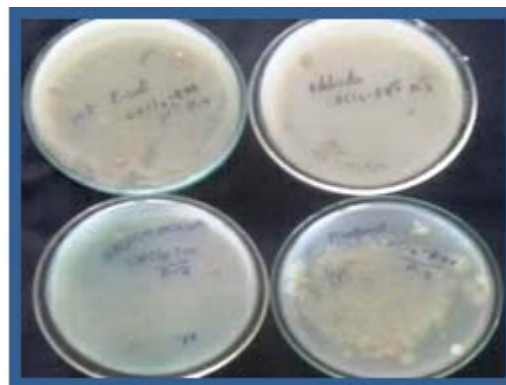


Figure 1 (b)

The results were revealed that the extracts of *Vetiveria lawsonii* possessing antimicrobial activity against the test organisms which observed from the zone of inhibition. This was due to the presence of various phytoconstituents of *Vetiveria lawsonii* and was confirmed by qualitative screening.

4. Conclusion

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

5. Future Scope

This evaluation emphasizes further research on *Vetiveria lawsonii* to describe the bioactive compounds involved for their antimicrobial activity and to evaluate their other pharmacological activities of the plant.

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Author Profile



Dr. D. Viji Saral Elezabeth is an Associate Professor in Nehru Memorial College, Tiruchirappalli, Tamilnadu, India. She majored in Chemistry (1988-1990) at Bishop Heber College, Bharathidasan University, Tiruchirappalli, Tamilnadu, India and obtained her Doctoral Degree in Physical Chemistry (2007) at the same College. She has more than sixteen years experience on teaching and research. Her research interest is mainly focused on “Phytochemistry and Natural Products” to evaluate the phytochemical constituents from medicinal plants in India and their pharmacological potential. This research field has spotlighted by many esteemed researchers around the world and she is inspiring with two students in doctorate and many students in graduate programs. Apart from Research, her main hobbies are reading books and writing research articles.



Mr. P. Ramachandran (Corresponding Author) obtained his master degree in Chemistry (2006-2008) at National College, Bharathidasan University, Tiruchirappalli, Tamilnadu, India. After finishing his master degree, he is working as an Assistant Professor in *Kongunadu College of Engineering and Technology*, Thottiam, Tiruchirappalli, Tamilnadu, India. Now, he is pursuing his Ph.D., (Part-Time) on “Phytochemistry and Natural Products” at Nehru Memorial College, Tiruchirappalli, Tamilnadu, India under the guidance of **Dr. D. Viji Saral Elezabeth**. His research interest is mainly focused on “Evaluation of Phytochemical potential of Selected Medicinal Plants in India”. He has published four research articles in peer reviewed international journals and three papers were accepted. Apart from Research, his main hobbies are reading books and writing research articles.