



# Comparative Microbiological Study of *Vetiveria Lawsonii* with *Bauhinia Blakeana*

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**Abstract—** The present study was mainly focused to compare the antimicrobial activities of *Vetiveria lawsonii* with *Bauhinia Blakeana* plant extracts.

**Materials and Methods:** The ethanolic extracts of the selected plants were prepared by continuous hot percolation method. The Agar well diffusion method was used for the evaluation of their antimicrobial activity.

**Result and Discussion:** In the phytochemical investigation showed the presence of secondary metabolites such as Alkaloids, Flavonoids, Terpenoids, Steroids, Carbohydrates, Glycosides, Saponins, Phytosterols and Proteins in *Vetiveria lawsonii* whereas the phytoconstituents of the plant *Bauhinia Blakeana* were Alkaloids, Flavonoids, Glycosides, Terpenoids, Anthocyanins, Phytosterols, Tannins, Carbohydrates, Saponins and Phenols. The microbiological study revealed the ethanolic extracts of both the plant showing antibacterial activity.

**Conclusion:** These phytochemicals may be the causes for the significant antimicrobial activity of *Bauhinia Blakeana* than *Vetiveria lawsonii*.

**Future Scope:** Hence, we can conclude that the phytoconstituents might be the cause for the antibacterial activity of *Vetiveria lawsonii* and *Bauhinia Blakeana*.

**Keywords—** *Vetiveria lawsonii*, *Bauhinia Blakeana*, antimicrobial activity, Agar well diffusion method, phytoconstituents.

## I. INTRODUCTION

Today, the majority of patients seeking medical advice are those suffering from some sort of infectious diseases and more than half a total deaths in the world are associated with the microbial infection. So we are in need of new drugs against the infectious diseases with high potential. In India, many traditional healing systems are being used against the various infectious diseases. Due to the huge availability of medicinal plants, it is possible to isolate new drugs from such plants for the treatment.

*Vetiveria lawsonii* is the meaning of *Chrysopogon lawsonii* (Hook.f.) Veldkamp. This plant is one of the important plants of Poaceae family with high medicinal value. *Bauhinia blakaena* is an evergreen tree with large thick leaves and striking purplish red flowers, sometimes called as 'Hong Kong Orchid'. It is sterile and hybrid between *Bauhinia variegata* and *Bauhinia pupurea*. There were no reports about antimicrobial activity of these plants. Hence, in the present study the ethanol extract of *Vetiveria lawsonii* was evaluated for their antimicrobial activity.

## II. MATERIAL AND METHODS

### A. Collection of identified Plant material

The fresh part of the plant of *Bauhinia blakaena* (flowers) was collected from Cholan Nagar, Tiruchirappalli District, Tamilnadu State, India. The collection was under the supervision of a Horticulturist. This plant *Bauhinia blakaena* was authenticated by State Horticulture Farm, Mudhalaipatti (Village), Trichy Karur Road, Karur (District), Tamilnadu. The flower of *Bauhinia blakaena* was thoroughly washed and dried under shade for 4 weeks, segregated, pulverized by a mechanical mixer grinder to fine powder prior to analysis.

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. These plant materials were used for this investigation.

#### B. Preparation of Flower Extracts

The ethanol extracts were successively prepared by hot continuous percolation method in 1:10 (w/v) ratio by Soxhlet extraction and concentrated. Then these were subjected to dryness to yield crude residue. These residues were employed for Antimicrobial evaluation.

#### C. Phytochemical Screening

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

#### D. 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.

#### E. Antibacterial assay

The antibacterial activity assays of these 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.

### III. RESULTS AND DISCUSSIONS

The results of Preliminary Phytochemical analysis were furnished in Table I. These results showed the presence of phytoconstituents of the plants.

TABLE I. Results of Preliminary Phytochemical analysis of ethanolic extracts of *Vetiveria lawsonii* and *Bauhinia Blakaena*

S.No.	Compounds	<i>Vetiveria lawsonii</i>	<i>Bauhinia Blakaena</i>
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

The results of antimicrobial activity of ethanolic extracts of these plants are furnished in Table II. The plant *Bauhinia Blakaena* is having highest potential against the test organisms when compared with *Vetiveria lawsonii*. The maximum zone of inhibition of *Bauhinia Blakaena* is 12mm against *Klebsiella sp.* while *Vetiveria lawsonii* have no potential. The maximum zone of inhibition of *Vetiveria lawsonii* is 9mm against *Proteus sp.* whereas *Bauhinia Blakaena* have high potent of 11mm. These results revealed that the ethanolic extracts of both the plants are potent antimicrobials against the test organisms. The antibacterial activities were observed from the zone of inhibition.

TABLE II. Results of Zone of inhibition of antibacterial activity of ethanolic extracts of *Vetiveria lawsonii* and *Bauhinia Blakaena*

S.No.	Name of the bacteria	Mean Zone of Inhibition of Ethanol Extract (mm)	
		<i>Vetiveria lawsonii</i>	<i>Bauhinia Blakaena</i>
1	<i>E.coli</i>	5	9
2	<i>Proteus sp.</i>	9	11
3	<i>Streptococcus sp.</i>	1	5
4	<i>Klebsiella sp.</i>	0	12

The figure is showing the mean zone of inhibition of antibacterial activity of the ethanolic extracts of *Vetiveria lawsonii* and *Bauhinia Blakaena*.

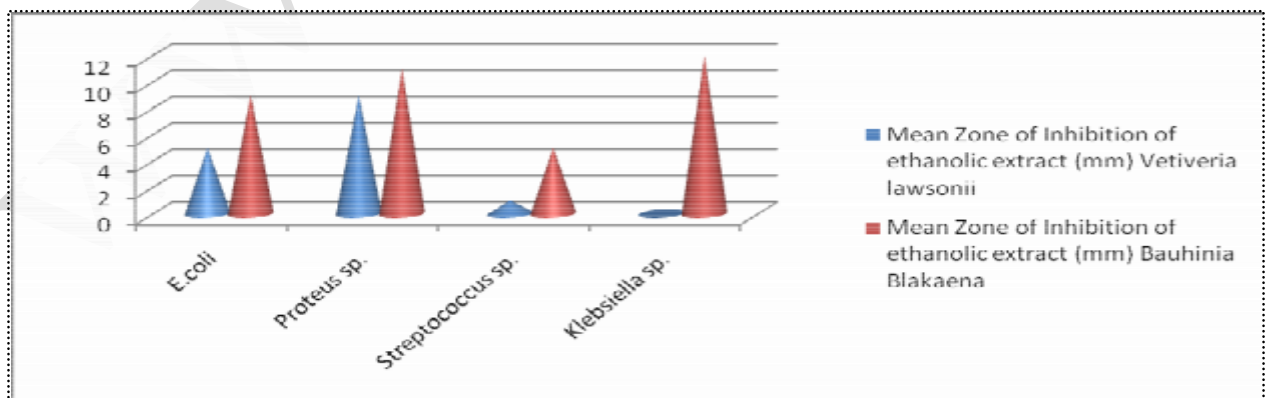


Fig 1. Mean zone of inhibition of antibacterial activity of the ethanolic extracts of *Vetiveria lawsonii* and *Bauhinia Blakaena*

The preliminary evaluation emphasizes further research to describe the bioactive compounds involved for their antimicrobial activity and to evaluate their other pharmacological activities of these plants.

#### IV. CONCLUSION

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

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