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Research Article

**PHYTO CHEMICAL INVESTIGATION & ANTIBACTERIAL  
ACTIVITY OF LEAVES AND ROOTS OF *JASMINUM  
GRANDIFLORUM*****Hunasagi B S<sup>\*1</sup>, Kalyane N.V<sup>2</sup>, Somashekhar M<sup>2</sup>**<sup>1</sup>Department of Phytochemistry, <sup>2</sup>Department of Pharmaceutical Chemistry  
BLDEA'S SSM College of Pharmacy and Research Centre Vijaypur**Abstract:**

The study was aimed at evaluating the Anti-microbial activity of different extract of leaves and roots of *Jasminum grandiflorum*. The dried roots and leaves of *Jasminum grandiflorum* were extracted with methanol, petroleum ether, chloroform and aqueous extracts. Extracts of *Jasminum grandiflorum* Linn (Oleaceae) were screened for their *in vitro* antibacterial activity by agar diffusion method in comparison with standard antibiotic penicillin. The extracts were studied using *Bacillus subtilis* and *Escherichia coli* as test organisms. These results suggest that leaf extracts of petroleum ether, methanol and aqueous extracts were effective against all the microorganisms.

**Key words:** *Jasminum grandiflorum* Linn, *Bacillus subtilis*, *Escherichia coli*, *in vitro* antibacterial activity.**\* Corresponding author:**

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**INTRODUCTION:**

Ayurveda the knowledge of life science bestowed health and longevity in the form of preventive and curative measures. These ancient systems play an important role even in the modern health care of the developed countries and at least 119 chemical substances, derived from 90 plant species, can be considered as important drugs [1,2].

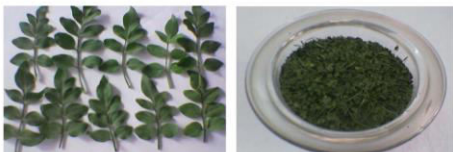
According to the world health organization, medicinal plants are the best source to obtain a variety of newer herbal drugs. About 80% of individuals from developed countries use traditional medicine, which has compounds derived from medicinal plants. Therefore, such plants should be

**Photo plate showing natural habitat of Jati.**

**Natural Habitat of Jati. (*Jasminum grandiflorum* Linn)**



**Showing Inflorescences of Jati.**



**Dried leaf of Jati. Coarse powder of Jati Patra**

investigated to better understand their properties, safety and efficacy.

Jasmines are an important group of flowering plants. They are widely cultivated and esteemed for their attractive fragrant flowers. This genus belongs to the family Oleaceae. Moreover, different parts of the plant such as the leaf, stem, bark, and roots are very useful and important in pharmaceutical industries. All contain manitol. *Jasminum grandiflorum* has diuretic and emmenagogue properties. The fresh juice of leaves are applied to corns, and the leaves are chewed and used in the treatment of ulcerations of the mouth. The leaves contain resin, salicylic acid, and an alkaloid named jasmine [3-6].

**MATERIALS AND METHODS:**

*Jasminum grandiflorum* Linn were collected and authenticated by KCP science college, Botany Dept. Vijayapur, and has been preserved in our Department for the future reference. Shade dried leaves (500 g) were coarsely powdered and subjected to successive solvent extraction by continuous hot extraction (soxhlet) with different solvents in their increasing order of polarity such as petroleum ether (60-800C), chloroform, acetone, methanol and water. Each time the marc was air dried and later extracted with other solvents. All the extracts were concentrated by distilling the solvent in a rotary flash evaporator. The yield was found to be 2.36, 1.26, 0.56, 4.67 and 9.26% w/w with reference to the air dried plant. The dried extracts were dissolved in dimethylsulphoxide (DMSO) and subjected to antibacterial activity in comparing with standard antibiotic Penicillin (10 µg/ml) *in-vitro* by disc diffusion method using *Bacillus subtilis* and *Escherichia coli* as test organism<sup>7-9</sup>.

**Microorganisms and media:**

**Gram Positive Bacteria:** *Bacillus subtil.* **Gram Negative Bacteria:** *Escherichia coli*, Bacteria's were obtained from the Department of Microbiology, Shri B M PATIL Medical College and Research Centre, Vijayapur. The bacterial stock cultures were maintained on Muller Hinton agar and stored at 40C.

**Antibacterial activity<sup>10-11</sup>:**

The extracts obtained above were screened for their antibacterial activity in comparing with standard antibiotic Penicillin (10 µg/ml) *in-vitro* by disc diffusion method [Greenwood et al., 2002] using *Bacillus subtilis* and *Escherichia* as test organism. Each extract were individually loaded on the 3 mm sterile disc at the concentration of 10, 25, 50, 100, 250, 500 and 1000 µg/ml and subjected to antibacterial activity. The results were recorded by measuring the zone of growth inhibition surrounding the disc. The experiments were done in triplicate.

**RESULTS AND DISCUSSION:**

The results of antibacterial activity are given in the Table 2 and 3. From the tables, it is clear that all the extract at various concentrations have shown antibacterial activity equivalent to that of standard against the entire tested organism. Petroleum ether, methanol and aqueous extracts of leaves have shown better activity than the standard against the Gram positive and Gram negative microorganisms. Chloroform extract was only effective against *Bacillus subtilis*. Acetone extract was most effective against *Escherichia coli*.

## Preliminary Phytochemical Investigation

Table No 1: Showing preliminary Phytochemical test:

Tests:	Leaf extract	Root extract
<b>i)Test for sterols:</b>		
a) Salkowski's test	+ ve	+ ve
b) Liberman-Burchardt's test.	- ve	+ ve
c) Sulphar test	+ ve	+ ve
<b>ii) Test for proteins:</b>		
i) Biuret test	+ ve	- ve
ii) Million's Test:	+ ve	- ve
iii) Xanthoprotein Test:	+ ve	- ve
<b>iii) Test for Triterpenoids:</b>		
i) Liebermann's Test:	-ve	- ve
ii) Tschugajew Test:	+ ve	- ve
<b>iv)Test for Alkaloids:</b>		
i) Mayer's Test:	+ ve	+ ve
ii) Wagner's Test:	+ ve	+ ve
iii) Hager's Test:	+ ve	+ ve
iv) Dragendorff's Test:	+ ve	+ ve
<b>v)Test for carbohydrates:</b>		
i) Molish's Test:	+ ve	+ ve
ii) Barfoed's Test:	- ve	+ ve
iii) Benedict's Test:	+ ve	+ ve
<b>vi)Test for Saponin's:</b>		
i) Foam Test:	+ ve	- ve
ii) Hemolytic Test	+ ve	- ve
<b>vii) Test for Tannin's:</b>		
i) Ferric chloride test:	+ ve	+ ve
ii) Lead acetate test:	+ ve	+ ve
iii) Bromine water test:	- ve	+ ve
<b>vii) Test for Flavonoid's:</b>		
i) Shinoda Test:	+ ve	+ ve
ii) Lead acetate:	+ ve	+ ve
iii) Alkaline reagent test:	+ ve	+ ve
iv) Ferric chloride test:	+ ve	+ ve
v) Bromine water test:	- ve	- ve
vi) Zinc HCl reduction test:	+ ve	+ ve

Table 2: Antibacterial activity of different extract of leaves and Roots of *Jasminum grandiflorum* against Gram negative organisms Concentration Zone of inhibition of extract in mm used [g/ml] *Escherichia coli*

	J G ROOT EXTRACT					J G LEAF EXTRACT				
	PEE	CE	AE	ME	AQE	PEE	CE	AE	ME	AQE
<b>10</b>	12	12	14	14.6	16	16	14.6	14	14	14
<b>25</b>	12	12	15	15.2	16.2	16.2	16	15.2	16	16
<b>50</b>	12	14	12	16	15.2	18	16.2	17	16	16.2
<b>100</b>	12	14.4	14	17	15.4	18.2	16.4	20	16.2	16.2
<b>250</b>	14	14.6	16	18	17	18.2	16.5	20.2	18	16.2
<b>500</b>	16	15.2	16	18	18	18.2	17.2	22	18.2	18
<b>1000</b>	16.6	16.6	16	18	18.2	21.4	22	18.6	18.2	18

Penicillin 16, 16

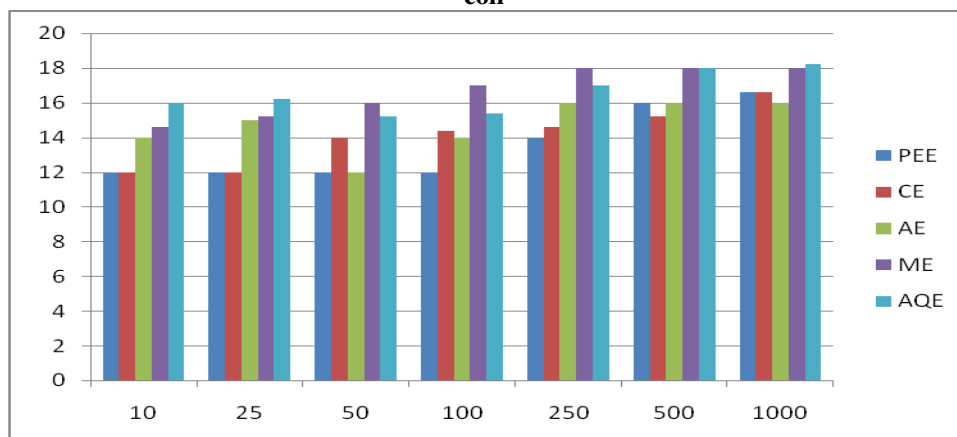
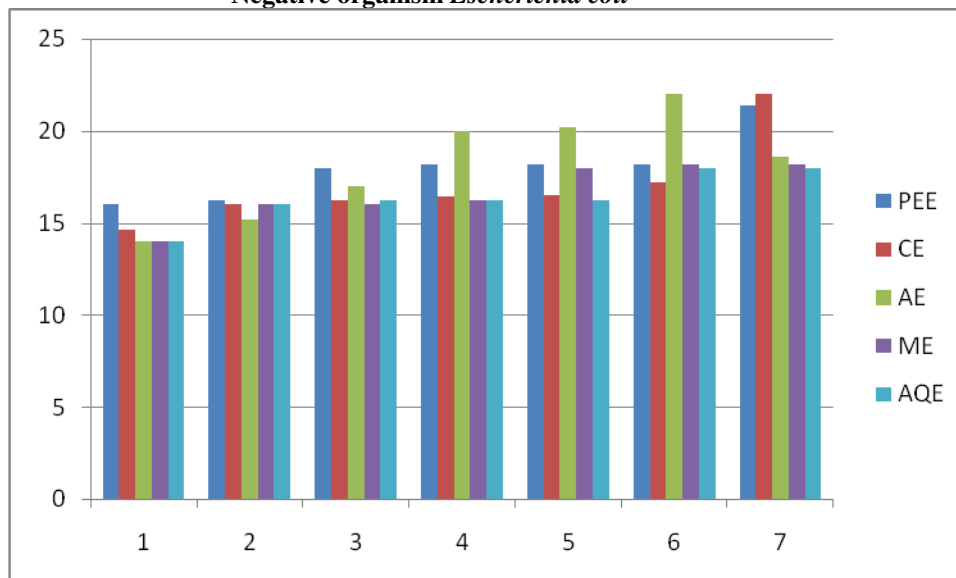
PEE-Petroleum Ether Extract CE-chloroform extract AE-acetone extract ME-methanol extract AQE-aqueous extract.

**Table 3: Antibacterial activity of different extract of leaves and Roots of *Jasminum grandiflorum* against Gram positive organisms**Concentration Zone of inhibition of extract in mm used [g/ml] *Bacillus subtilis*

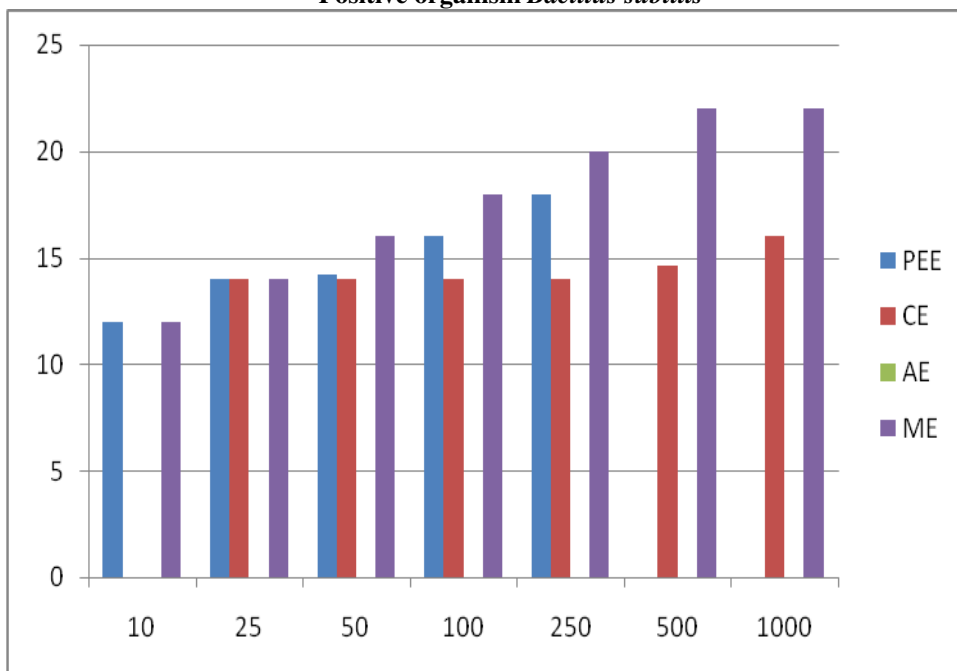
	J G ROOT EXTRACT					J G LEAF EXTRACT				
	PEE	CE	AE	ME	AQE	PEE	CE	AE	ME	AQE
<b>10</b>	12	-	-	12	-	13	15	13	14.4	16
<b>25</b>	14	14	-	14	-	14	16.4	14	15	17
<b>50</b>	14.2	14	-	16	-	15	16	14.2	16	18
<b>100</b>	16	14	-	18	-	15	16.2	14.4	17	18
<b>250</b>	18	14	-	20	16	16	16.6	16	18	18
<b>500</b>	-	14.6	-	22	18	17	17.2	18	18.6	18
<b>1000</b>	-	16	-	22	22	19	18	18.2	19	20

Penicillin 18.6, 16

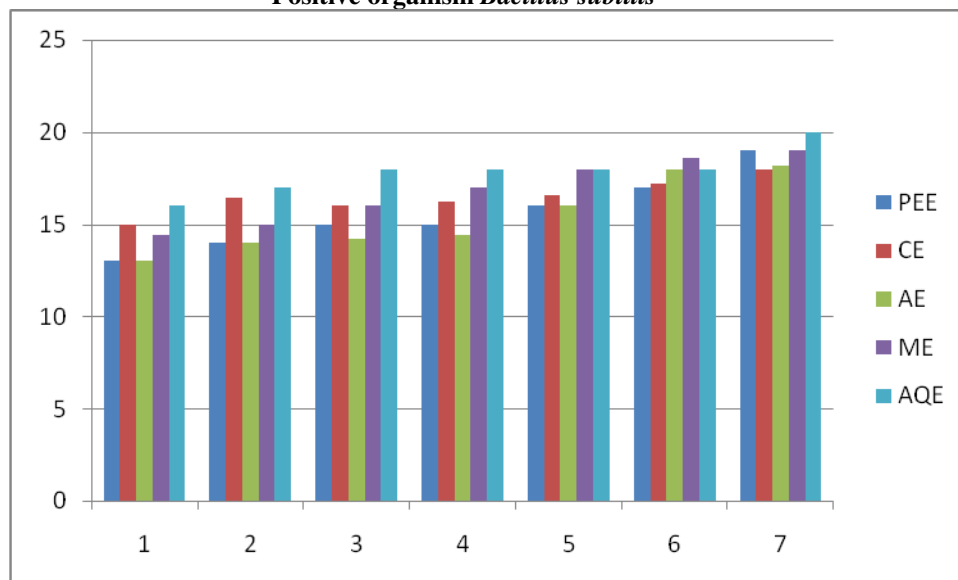
PEE-Petroleum Ether Extract CE-chloroform extract AE-acetone extract ME-methanol extract AQE-aqueous extract.

**Graph No.1 showing Root extracts of *Jasminum grandiflorum* against Gram negative organism *Escherichia coli*****Graph No.2 showing leaf extracts of *Jasminum grandiflorum* against Gram Negative organism *Escherichia coli***

**Graph No. 3 showing Root extracts of *Jasminum grandiflorum* against Gram Positive organism *Bacillus subtilis***



**Graph No. 4 showing leaf extracts of *Jasminum grandiflorum* against Gram Positive organism *Bacillus subtilis***



### CONCLUSION:

It is concluded that the plant extract possess antibacterial activity against test organism used. The zone of inhibition varied among suggesting that the varying degree of efficacy and different phytoconstituents of herb on the target organism. Preliminary phytochemical screening of different extracts showed the presence of alkaloids, tannins, saponin, flavonoids, volatile oils, steroids and

glycosides. The antibacterial activity of the plant parts may be due to the presence of various active principles in the drug. Further studies are needed to isolate and characterize the bioactive principles to develop new antibacterial drugs.

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