



Antibacterial activity of methanolic root extract of *Passiflora foetida* Linn

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Abstract:

The *in vitro* antibacterial activity of the roots of *Passiflora foetida* Linn. was investigated against various strains of bacteria such as *Staphylococcus epidermidis*, *Bacillus subtilis*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa* and *Escherichia coli* by Kirby – Bauer disc diffusion method. The methanolic extract showed significant activity against *Klebsiella pneumoniae*, *Pseudomonas aeruginosa* and *Escherichia coli* when compared with the standard antibiotics Levofloxacin(5mcg/disc), Amikacin (10mcg/disc) and Sparfloxacin (5mcg/disc) respectively.

Key words: *Passiflora foetida* Linn, roots, antibacterial activity.

Introduction:

Passiflora foetida Linn belongs to Passifloraceae family is a herbaceous climber, native of tropical America and found wild in several parts of India¹. It is commonly called as Mupparisavalli, Siruppunaikkalli in Tamil, Tellajumiki in Telugu, Kukkiballi in Kannada and Chadayan, Poochapazham in Malayalam². The whole plant is used in the treatment of insomnia and anxiety³. The decoction of fruit is used for asthma and biliousness. Decoction of leaves and roots is emmenagogue and also used in hysteria. The plant is used for curing itches. The major compounds present in the plant are maltol, phytosterols, cyanogenic glycoside, flavonoids and their glycosides. The present study deals with the antibacterial activity of methanolic root extract of the plant.

Materials and Methods:

Collection of the plant material

Fresh roots of *Passiflora foetida* Linn were collected in the month of July 2009 from Komarapalayam, Namakkal District, Tamil Nadu and authenticated by Deputy director in charge, Botanical survey of India, Coimbatore, Tamil Nadu. A voucher specimen preserved in our department (JKKMMRF/Pharm.chem/2009/06)

Preparation of extract

Seven hundred and fifty grams of coarse powder of shade dried roots of *Passiflora foetida* was extracted with methanol in soxhlet extractor for 72 hrs, dark brown

residue was obtained after concentrating the extract under reduced pressure. The yield was found to be 12.6%. The obtained extract was stored in desiccators for further phytochemical and antibacterial investigations. The dried material was tested for its constituents by standard methods^{4&5} and the results were tabulated in Table 1.

Table 1: Phytochemical screening of methanolic root extract of *Passiflora foetida* Linn.

Phytoconstituents	Methanol extract
Carbohydrates	+
Glycosides	+
Proteins	-
Fixed oil and fats	-
Gums and Mucilage	-
Alkaloids	-
Phytosterol	+
Flavanoids	+
Phenolic compounds	+
Saponins	-

(+) indicates positive, (-) indicates negative

The methanolic extract was diluted with DMSO to the concentration of 250mcg/ml, 500mcg/ml, 750mcg/ml, 1000mcg/ml and 1250mcg/ml.

Table 2: Evaluation of antibacterial activity of methanolic root extract of *Passiflora foetida* Linn.

S.N.	Microorganism	Standard antibiotic used and the concentration	Zone of inhibition of standard antibiotic in mm	Zone of inhibition (mm)				
				250 mcg	500 mcg	750 mcg	1000 mcg	1250 mcg
1	<i>Staphylococcus epidermidis</i> (MTCC 435)	Cloxacillin 5mcg	21 mm	9	10	12	13	15
2	<i>Bacillus subtilis</i> (MTCC 121)	Amoxicillin 30mcg	35mm	8	10	11	13	15
3	<i>Klebsiella pneumoniae</i> (MTCC 432)	Levofloxacin 5mcg	19mm	7	8	10	11	13
4	<i>Pseudomonas aeruginosa</i> (MTCC 424)	Amikacin 10mcg	26mm	14	20	20	21	22
5	<i>Escherichia coli</i> (MTCC 739)	Sparfloxacin 5mcg	22mm	9	11	13	14	16

Microorganisms like *Staphylococcus epidermidis*, *Bacillus subtilis*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa* and *Escherichia coli* were used for testing.

Antibacterial Evaluation

Kirby – Bauer disc diffusion method⁶ was used for the antibacterial study. Cloxacillin(5mcg/disc), Amoxicillin(30mcg/disc), Levofloxacin(5mcg/disc), Amikacin(10mcg/disc) and Sparfloxacin(5mcg/disc) were used as the standard antibiotics for the organisms *Staphylococcus epidermidis*, *Bacillus subtilis*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa* and *Escherichia coli* respectively. The filter paper impregnated with methanolic extract (at the concentrations of 250mcg/ml, 500mcg/ml, 750mcg/ml, 1000mcg/ml and 1250mcg/ml.) and standard antibiotic disc were placed

aseptically on the Muller-Hinton agar medium (Hi-Media, Mumbai) which was already swabbed with the test organism and incubated at 37°C for 16 to 18 hours. The zone of inhibition in mm was measured and the results were given in Table 2.

Results and Discussion:

The observation of the minimum inhibitory concentration study for methanolic extract against *Staphylococcus epidermidis*, *Bacillus subtilis*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa* and *Escherichia coli*. From the data it is evident that methanolic extract is active against both gram positive and gram negative bacteria, but more active against gram negative bacteria such as *Klebsiella pneumoniae*, *Pseudomonas aeruginosa* and *Escherichia coli*. With standard antibiotic such as Levofloxacin(5mcg), Amikacin (10mcg) and Sparfloxacin(5mcg) respectively. However

preliminary phytochemical analysis of methanolic extract revealed the presence of carbohydrate, glycosides, phytosterols, flavonoids and phenolic compounds. The isolation of components of root of *Passiflora foetida* is in progress as potent antibacterial agents.

Conclusion:

The methanolic root extract of *Passiflora foetida* contains various phytoconstituents such as carbohydrate, glycosides, phytosterol, flavonoids and phenolic compounds. The antibacterial activity in methanolic root extract of *Passiflora foetida* by Kirby –Bauer disc diffusion method showed good antibacterial activity against gram negative organism.

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